Camden County Travel Management Coordination Center
Demonstration Project NJ-26-7065

HIGH-LEVEL DESIGN

22 May 2008

RUTGERS
Edward J. Bloustein School
of Planning and Public Policy

Alan M. Voorhees
Transportation Center

Contents

1. Purpose of Document

This document provides a detailed description of the system architectural high-level design for the Camden County Travel Management Coordination Center. The system architecture and the high-level design has been built from the system requirements as developed and presented on 15 February 2008. It also provides the hardware and software details for a federated TMCC that integrates both currently used and new technology into the TMCC's system. Key stakeholder feedback on the system requirements document and the regional ITS architecture as provided by Delaware Valley Regional Planning Commission (DVRPC) and NJ Transit has driven this stage of the design process.

Insert Brief summary of the contents of the document here following completion of sections 3-5. The document describes what the system will do and where it will do it. The basis of the design is…… Then add info on the software, hardware, etc.

2. Scope of Project

The purpose of this project is to develop a Travel Management Coordination Center (TMCC) designed, implemented, and maintained by and for Camden County, New Jersey. The Camden County TMCC will provide expanded and more efficient transportation services to all consumers by coordinating the various transportation provider-operators and funding agencies present in the area. Intelligent Transportation Systems (ITS) technologies are crucial to implementing a coordinated transportation system in Camden County. The TMCC is designed with focus on five core needs that have been identified previously within the systems engineering process. They are as follows:

- *Creation of a One-Call for Service:* Creating a single point of contact for transportation services in the county streamlines and simplifies the process for consumers seeking current transportation information. For human services transportation and paratransit trips, the TMCC will also provide a simplified point of contact for scheduling those trips with the appropriate operators. The key to this system will be implementing a single phone number and a single web portal for access to the TMCC.

- *Coordination of Provider Trip Functions:* Coordination of scheduling, billing, and/or fare collection among other functions is key to deploying the TMCC. Here various technological applications will be applied to share information between TMCC operations, service providers, and funding sources.

- *A Seamless Fare and Billing System:* A seamless fare and billing system will be implemented, allowing users to use a single instrument to pay

transit fares and bill the appropriate agency for human services trips. This system component will also allow for better tracking of data, such as passenger miles, which will also be used to more accurately bill funding sources for a given human services trip.

- *Improved Customer Trip Information:* Adding various technologies for the dissemination of real-time information will be provided at high volume transit stops, on vehicles, and at other key locations. This could take the form of information kiosks at a public library or the Camden One-Stop center or variable message signs at key transit stops.

- *Improved Customer Security:* Additional security measures will be implemented at key transportation stops and on-board vehicles. This could take the form of improved lighting, security cameras, and emergency call boxes at transit stops in high crime areas or security cameras and/or driver panic buttons on-board vehicles.

3. Camden TMCC High Level Design Subsystems

The Camden TMCC System High Level Requirements are organized by the four System Needs as follows:

- One Stop Call Center
- Seamless Fare and Billing System
- Coordination of Provider Trip Functions
- Customer Trip Information
- Customer Security

Each of the High Level Requirements descend into Detailed Requirements that describe the specific technology which will be attributed to one or more participating agencies. It should be noted that the One Stop Call Center would be the newest one of several key providers that will operate as a part of a federated system.

The physical elements, organized by the specific technology, are described as subsystems that tie back to the requirements and identify the functional processes, providers, hardware, and software components. The functionality in each subsystem represents the functions that are expected to be a part of the Camden TMCC.

The provider subsystems also describe the physical locations and personnel involved in the support of the first tier subsystems.

Commercial off the Shelf (COTS) are identified for the software items. All hardware items are considered to be COTS.

3.1. Global Positioning Systems/Automatic Vehicle Locator (GPS/AVL) (S3-2)

The GPS/AVL system provides the core subsystem that provides the support for other subsystems including the Mobile Data Computers (MDC), Vehicle Arrival Information Systems, One-Call Center Website, Customer Telephone Alert, and Smart Card Fare Payment System.

3.1.1. Functionality

- *Event Based Reporting* - location of the vehicle is reported with all data transmissions
- *Distance Based Reporting* - every time the vehicle has moved a pre-determined distance, it automatically reports vehicle location to the Host AVL
- *Time Elapsed Reporting* - every pre-determined time elapse, the vehicle location is automatically reported to the Host AVL
- *Hybrid GPS Reporting* - system incorporates the advantages of the three preceding methods
- *Polling* - all system dispatchers have the capability to request the system to identify the location of any vehicle at any time
- *Maximum Report Rate* - the maximum location report frequency can be set to conserve air time
- *Communication to PDA* - enable the bus stop selection screens to be provided to web enabled cell phones, Palm Pilots, Blackberry devices, and iPhones.

3.1.2. Hardware Components

- GPS Receiver
- GPS Modem
- Existing Dell PC or equivalent computer terminals
- PC for Host Interface Software

3.1.3. Software Components

- Host System Interface Software (Middleware or X-Gate) (COTS)
- Wireless Communication System Interface Software (COTS)
- ESRI Mapping file software (COTS)

3.1.4. Participating Providers, Personnel and Facilities

3.1.4.1. Sen-Han Transit (Phase 1)

- The software components for this subsystem would be located at the Sen-Han Transit central location which would serve all of providers
- A total of 38 vehicles would be equipped with the GPS/AVL hardware required for this subsystem (S3-2.1.1)
- A total of ten (10) workstations would be equipped with the mapping software for participation in the functions of this GPS/AVL subsystem (S3-2.2.1)

3.1.4.2. SJTA (Phase 1)

- A total of 22 vehicles would be equipped with the hardware required by this subsystem (S3-2.1.1)
- A total of four (4) workstations would be equipped with the mapping software for participation in the functions of this subsystem (S3-2.2.1)

3.1.4.3. Faith Based Collaborative (Phase 1)

- A total of 10 vehicles would be equipped with the hardware required by this subsystem (S3-2.1.1)
- A total of four (4) workstations would be equipped with the mapping software required by this subsystem (S3-2.2.1)

3.1.4.4. One-Call Center (Phase 1)

- A total of five (5) workstations would be equipped with the mapping software required by this subsystem (S3-2.2.1)

3.2. Mobile Data Computers (MDC) (S3-3)

The MDC enables the transmission and recording of information and data to be transmitted between the driver, the dispatcher and the Routing and Scheduling and Dispatch (RSD) Software reporting system. The MDC subsystem uses the GPS/AVL Subsystem (S3-2) as a major component of this subsystem.

3.2.1. Functionality

3.2.1.1. Log-On Functionality

- Automatic Display of drive log-on form upon powering up
- Automatic Display of current odometer reading
- Validation of employee log-on number with RSD software

3.2.1.2. Display Functionality

- Display of connectivity to radio/wireless network
- Display of alert to new message for driver
- Ability to adjust volume and backlighting of display

3.2.1.3. Communications Functionality

- Allow adding, updating and saving trip data without driver intervention
- Allow notification to driver of incoming message by visual and audio
- Allow driver to respond to a message
- Allow driver be notified of success or failure of transmission (send and notify)
- Allow driver to send message only once, whether acknowledged or not (send and forget)
- Allow messages to be stored in a queue and repeatedly attempt to deliver (store and forward)
- Allow pre-defined messages (canned messages) to be received

3.2.1.4. Demand Response Functionality

- Allow the driver to download and store up to 100 rider/trip stops
- Allow the driver to scroll through the manifest to the maximum number of transmitted trips
- Provide the driver with Job List, Job Detail and Job Perform screens providing an overview of job lists, detailed information about each stop and information requests to be completed per Dispatcher instruction

3.2.1.5. Hardware Components

- Mobile Data Computer
- Vehicle Logic Unit (VLU)
- GPS Antenna
- Antenna for communication with Host RSD Software
- GPS Receiver
- Wireless Modem
- Mounting equipment, cables and fuses

3.2.2. Software Components

- X-Gate or middleware software for communication between the vehicle GPS unit and the RSD software (COTS)
- Wireless Communication Interface Software (COTS)
- Wireless Data Network Software (COTS)
- ESRI Mapping File software (COTS)

Note: The procurement for AVL and MDC is consolidated and the MDC software components are inclusive of all AVL components

3.2.3. Participating Providers, Personnel and Facilities

3.2.3.1. Sen-Han Transit (Phase 1)

- The software components for this subsystem would be located at the Sen-Han Transit central location which would serve all of providers
- A total of 38 vehicles would be equipped with the hardware required by this subsystem (S3-3.1, S3-3.3, S3-3.4)
- A total of twelve (12) workstations would be equipped with the software needed to communicate with vehicles participating in this subsystem (S3-3.2, S3-3.3, S3-3.4)

3.2.3.2. SJTA (Phase 1)

- A total of 22 vehicles would be equipped with the hardware required by this subsystem (S3-3.1, S3-3.3, S3-3.4)
- A total of four (4) workstations would be equipped with the software needed to communicate with vehicles participating in this subsystem (S3-3.2, S3-3.3, S3-3.4)

3.2.3.3. Faith Based Collaborative (Phase 2)

- A total of 10 vehicles would be equipped with the hardware required by this subsystem (S3-3.1, S3-3.3, S3-3.4)
- A total of four (4) workstations would be equipped with the software needed to communicate with vehicles participating in this subsystem (S3-3.2, S3-3.3, S3-3.4)

3.2.3.4. One-Call Center (Phase 2)

- A total of five (5) workstations would be equipped with the software needed to communicate with vehicles participating in this subsystem (S3-3.2, S3-3.3, S3-3.4)

3.3. Routing, Scheduling and Dispatch (RSD) Software (S3-1)

The RSD software is the key component of coordination, facilitating the integration of customer registration, trip reservation, scheduling, dispatching, and reporting by participating service providers and the One-Call Center.

3.3.1. Functionality

3.3.1.1. Customer Registration (S3.1-2)

- Provide screen that provides for Address information including phone, home address, mailing address and ID numbers
- Provide screen that provides for Passenger Requirements including Passenger category, mobility aid needs, Attendant needs ADA paratransit eligibility category and special assistance notes
- Provide screen that provides for identifying Billing Codes for which the customer is eligible to receive funding for transportation trips
- Provide screen that provides information on passenger home location geocoding

3.3.1.2. Vehicle Management (S3-1.7 NEW)

- Provide screen for identifying available fleet vehicles including seating and wheelchair capacity
- Provide capability for easily adding and removing vehicles from fleet available for trip assignment

3.3.1.3. Trip Reservation (S3-.3)

- System must be able quickly search for customers and create, delete and modify trip reservation
- Scheduling function that allows the user to quickly search among existing vehicle runs to recommend the most efficient time slot to customers
- System should allow the user to book demand response and standing order trips in under 2 minutes
- System should allow return trips to be scheduled as Will Call Return as well as with a designated return trip pickup time

3.3.1.4. Scheduling and Routing (S3-1.4, S3-1.5.1, S3-1.5.2)

- The system should enable both standing orders and demand trips to be scheduled with standing orders providing the framework for the vehicle trip assignment (S3-1.4)

- The system should allow for batch scheduling of all trip reservations by assigning trips to vehicle runs which have locked subscription trips (S3-1.5.1)
- The system should allow for trips to be inserted to vehicles runs in either pickup or drop-off order by the dispatcher or scheduler (S3-1.5.2)
- The underlying scheduling algorithm should generate vehicle runs based on travel times by the area street network and not by triangulation or straight line travel distances (S3-1.5)

3.3.1.5. Geographic Information System (GIS) Mapping (S3-1.8 NEW)

- The routing and scheduling system should be integrated with an industry standard GIS engine
- The GIS should enable the user to use a click and drag or similar method to determine mileage for measured route segments
- The user should be able to window zoom in/out and display landmark names by point and click
- The user should be provided map layers that provide the existing network of fixed rail, bus and modified fixed route area transit services to facilitate connections between demand response and transit services
- Trip origins, destinations and route paths of demand response vehicle runs should be able to be displayed on the GIS map

3.3.1.6. Dispatching (S3-1.6, S3-1.5.2)

- The dispatcher must be able to easily toggle through screens while the customer is on the telephone (S3-1.6)
- The dispatcher should be able to access all vehicle runs and be able to perform trip insertion changes on the vehicle manifests (S3-1.5.2)

3.3.1.7. Billing and Invoicing

- The software must be able to handle a variety of unit cost pricing measures and billing rules (S2-1.1)
- The software shall have the capability of using GIS distance calculation to determine mileage based trip costs (S2-1.2)
- The software shall have the capability of enabling individual trips to be assigned to discrete billing codes (S2-1.3)
- The software shall have the capability of being able to facilitate the calculation of shared costs between billing funding sources (S2-1.3)
- The software shall have the capability of generating a report of the rider trips by funding source (S2-3.1)

3.3.1.8. Reporting (S3-1.9)

- The system shall enable the user to extract client reports based on funding source, destination, customer category, no-shows, cancellations and number and cost of trips
- System shall enable the user to create user designed reports and custom reports

3.3.1.9. Data Base Integration and Expansion Options (S3-1)

- The system should be an OBDC- compliant relational data base with the capability for import/export with other OBDC systems
- The system should be allow for the integration of AVL, MDC, Fixed Route Integration, Interactive Voice Response, ASP options and Internet Deployment

3.3.2. Hardware Components

- Workstations with a minimum speed of 2.8 GHZ, 2.0 GB memory and 80 GB hard drive (Four new workstations for Faith Based and One-Stop)
- RSD Scheduler Server
- Server meeting Microsoft SQL Server Standard
- 100/1000 MB Network

3.3.3. Software Components

- Unified RSD software (COTS)
- ESRI Mapping software (COTS)

3.3.4. Participating Providers, Personnel and Facilities

3.3.4.1. Sen-Han Transit (Phase 1)

- One central location would have the hardware and software components of this subsystem (S3-1)
- A total of twelve (12) workstations would be licensed at this location (S3-1)

3.3.4.2. SJTA (Phase 1)

- One central location would have the hardware and software components of this subsystem (S3-1)
- A total of four (4) workstations would be licensed at this location (S3-1)

3.3.4.3. Faith Based Collaborative (Phase 2)

- One central location would have the hardware and software components of this subsystem (S3-1)
- A total of four (4) workstations would be licensed at this location (S3-1)

3.3.4.4. One-Call Center (Phase 1)

- One central location would have the hardware and software components of this subsystem (S3-1)
- A total of five (5) workstations would be licensed at this location (S3-1)

3.4. Vehicle Arrival Information Display at Key Route Locations (S1-1.4)

The provision of expected vehicle arrival information at key on-route locations is a means of increasing customer confidence in using the community transit and traditional transit system. The "next bus" software and display use the GPS/AVL subsystem (S3-2) as a major component of this subsystem.

3.4.1. Functionality

- Enables the arrival time of fixed route vehicles to be displayed at key bus shelters, transit terminals and key human service agency lobbies
- Enables the bus screen maps to be displayed on PDAs such as web enabled cell phones, Palm Pilots, Blackberry devices, and iPhones

3.4.2. Alternative 1

The provision of expected vehicle arrival information at key on-route locations is a means of increasing customer confidence in using the community transit and traditional transit system. The Bus Finder software and display use the **GPS/AVL subsystem (S3-2)** as a major component of this subsystem.

3.4.2.1. Functionality

- Enables the arrival time of fixed route vehicles to be displayed at key bus shelters, transit terminals and key human service agency lobbies
- Enables the bus screen maps to be displayed on PDA's such as web enabled cell phones, Palm Pilots, Blackberrys and iPhones
- Opening touch screen provides choice of vehicle route or run
- Second screen showing choice of vehicle run stops can be viewed in table or map format displaying stops
- Third screen provides ETA for selected vehicle run at selected vehicle stop

3.4.2.2. Hardware

- Bus Shelter Display Unit- a weather resistant touch screen unit
- Bus stop pole to affix unit

3.4.2.3. Software

- Host System Interface Software(Middleware or X-Gate) (COTS)
- Wireless Communication System Interface Software (COTS)
- ESRI Mapping file software (COTS)

3.4.2.4. Participating Providers, Personnel and Facilities

1. Sen-Han Transit (Phase 3)
    - 38 Vehicles with AVL would be potentially in this subsystem (S1-1.4)
2. SJTA (Phase 3)
    - 22 vehicles with AVL would be potentially in this subsystem (S1-1.4)
3. One-Call Center (Phase 3)
    - Five pilot facilities/transit stops including the One-Stop Center, Cooper Hospital, Rand Transportation Center, Pennsauken Industrial Park and Lindenwold PATCO would be included in this subsystem (S1-1.4)
    - The required software components for this subsystem would be located at the One-Stop Center location (S1-1.4)

3.4.3. Hardware

- Bus Shelter Display Unit- a weather and vandal resistant light emitting diode display using 110 VAC nominal power with a voice activation feature
- Lobby/Terminal Display Unit- a vandal resistant light emitting diode display using 110 VAC nominal power with a voice activation feature

3.4.4. Software

- Host System Interface Software(Middleware or X-Gate) (COTS)
- Wireless Communication System Interface Software (COTS)
- ESRI Mapping file software (COTS)

3.4.5. Participating Providers, Personnel and Facilities

3.4.5.1. Sen-Han Transit (Phase 3)

- 38 Vehicles with AVL would be potentially in this subsystem (S1-1.4)

3.4.5.2. SJTA (Phase 3)

- 22 vehicles with AVL would be potentially in this subsystem (S1-1.4)

3.4.5.3. One-Call Center (Phase 3)

- Five pilot facilities/transit stops including the One-Stop Center, Cooper Hospital, Rand Transportation Center, Pennsauken Industrial Park and Lindenwold PATCO would be included in this subsystem (S1-1.4)
- The required software components for this subsystem would be located at the One-Stop Center location (S1-1.4)

3.5. One Stop Call Center/ Telephone System (S4-2)

3.5.1. Functionality

- Provide sufficient phone line capability to meet maximum call demand of 75 calls per hour with a maximum response time of 90 seconds and an average call time of three minutes
- Have a case tracking system capable of measuring average call time, response time and category of call
- Have a call operator microphone and receiver enabling the call operator to perform computer and other office functions while handling a call
- Have the capability of accepting auto attendant transfers from 211 call center
- Have an auto attendant menu capable of enabling a caller to be transferred to a participating key provider

3.5.2. Software

- Have a reporting system capable of producing customized reports from case tracking system
- Voice Over Internet Protocol (VOIP) software
- Case tracking system

3.5.3. Hardware

- Separate T-1 lines for data and voice
- Wireless operator headsets
- Server with backup server to ensure constant response time
- Split Screen Monitors to simultaneously handle call information and routing/scheduling information

3.5.4. Participating Providers, Personnel and Facilities

3.5.4.1. One Call Center (Phase I)

- Five (5) cubicles with maximum wall height of 4.5 feet to reduce ambient noise and enable face to face communication between call center operators
- Five operators capable of handling 15 calls per hour during third year of operation

3.6. Seamless Fare and Billing System/Electronic Fare Payment (S2-2.1)

3.6.1. Alternative 1: Magnetic Stripe/Smart Card Reader Functionality

A smart card uses a contact reader that is part of a Mobile Data Computer (MDC) unit on each vehicle that will serve as the Point of Sale (POS) terminal. The card reader would enable the customer to be charged for the length of trip based on mileage or zones of travel.

3.6.1.1 ELIGIBILITY

- The swipe card will enable the user to be identified as an active eligible client of Medicaid or other client based human service agencies that purchase transportation
- The MDC would transmit the user information to the routing and scheduling passenger data base to identify if the user is an active eligible client
- The card swipe will send a message informing the dispatcher that the customer has boarded the vehicle
- The card swipe will trigger an AVL notation to identify the point of boarding

3.6.1.2 CONNECTION/RESPONSE

- The card swipe will trigger a response in no greater than 10 seconds

3.6.1.3 Debit Card Design

- The card will be pre-loaded based on the amount of value determined by Medicaid or other human service agency grantors
- The TMCC or designated agent will have access to all debit card transactions
- The TMCC or designated agent will be able to deactivate lost or stolen cards immediately upon notification
- The TMCC or designated agent will be able to procure the necessary equipment to produce the debit cards

3.6.1.4 Data Collection Requirements

The POS/MDC must be able to provide the following information from the driver to the dispatcher when the customer swipes their card:

- Customer Card identification number
- Time and mileage at time of card swipe (trip origin)
- Trip ID number
- Funding Agency ID
- Arrival time and mileage at time of card swipe (trip destination)
- Identification of vehicle number and driver number

3.6.1.5 Reports

Reports will detail swipe card transactions by the following data:

- Type of card used
- Customer
- Transaction Amount
- Customer Trip Origin
- Customer Trip Destination
- Common Site Origins and Destinations

3.6.2. Hardware (S3-3)

- Mobile Data Computer (MDC)
- Vehicle Logic Unit (VLU)
- GPS Antenna
- Antenna for communication with Host RSD Software
- GPS Receiver
- Wireless Modem
- Mounting equipment, cables and fuses
- Magnetic card reader option for MDC

3.6.3. Software (S3-3)

- X-Gate middleware software between MDC Communications software and the RSD software
- Wireless Communication Interface Software (COTS)
- Wireless Data Network Software (COTS)

4. Hardware Components

4.1. Global Positioning Systems/Automatic Vehicle Locator (GPS/AVL) (S3-2)

4.1.1. Functionality

- GPS Receiver
- GPS Modem
- Existing Dell PC or equivalent computer terminals
- PC for Host Interface Software

4.2. Mobile Data Computers (MDC) (S3-3)

4.2.1. Functionality

- Mobile Data Computer
- Vehicle Logic Unit (VLU)
- GPS Antenna
- Antenna for communication with Host RSD Software
- GPS Receiver
- Wireless Modem
- Mounting equipment, cables and fuses

4.3. Routing, Scheduling and Dispatch (RSD) Software (S3-1)

4.3.1. Functionality

- Workstations with a minimum speed of 2.8 GHZ, 2.0 GB memory and 80 GB hard drive (Four new workstations for Faith Based and One-Stop)
- RSD Scheduler Server
- Server meeting Microsoft SQL Server Standard
- 100/1000 MB Network

4.4. Vehicle Arrival Information Display at Key Route Locations (S1-1.4)

4.4.1. Functionality

- Bus Shelter Display Unit- a weather and vandal resistant light emitting diode display using 110 VAC nominal power with a voice activation feature
- Lobby/Terminal Display Unit- a vandal resistant light emitting diode display using 110 VAC nominal power with a voice activation feature

4.5. One Stop Call Center/ Telephone System (S4-2)

4.5.1. Functionality

- Separate T-1 lines for data and voice
- Wireless operator headsets
- Server with backup server to ensure constant response time
- Split Screen Monitors to simultaneously handle call information and routing/scheduling information

4.6. Seamless Fare and Billing System/Electronic Fare Payment (S2-2.1)

4.6.1. Functionality

- Mobile Data Computer with Magnetic Card Reader Option (S3-3)

5. Software Components

5.1. Global Positioning Systems/Automatic Vehicle Locator (GPS/AVL) (S3-2)

5.1.1. Functionality

- Host System Interface Software(Middleware or X-Gate) (COTS)
- Wireless Communication System Interface Software (COTS)
- ESRI Mapping file software (COTS)

5.2. Mobile Data Computers (MDC) (S3-3)

5.2.1. Functionality

- X-Gate or middleware software for communication between the vehicle GPS unit and the RSD software (COTS)
- Wireless Communication Interface Software (COTS)
- Wireless Data Network Software (COTS)
- ESRI Mapping File software (COTS)

5.3. Routing, Scheduling and Dispatch (RSD) Software (S3-1)

5.3.1. Functionality

- Unified RSD software (COTS)
- ESRI Mapping software (COTS)

5.4. Vehicle Arrival Information Display at Key Route Locations (S1-1.4)

5.4.1. Functionality

- Host System Interface Software(Middleware or X-Gate) (COTS)
- Wireless Communication System Interface Software (COTS)
- ESRI Mapping file software (COTS)

5.5. One Stop Call Center/ Telephone System (S4-2)

5.5.1. Functionality

- Have a reporting system capable of producing customized reports from case tracking system
- Voice Over Internet Protocol (VOIP) software
- Case tracking system

5.6. Seamless Fare and Billing System/Electronic Fare Payment (S2-2.1)

5.6.1. Functionality

- X-Gate middleware software between MDC Communications software and the RSD software

- Wireless Communication Interface Software (COTS)
- Wireless Data Network Software (COTS)

5.7. One-Call Center Web Portal (S4-1)

The One-Call Center Web Portal provides a core subsystem for information access via the internet by riders, providers, and other potential system users.

5.7.1. Functionality

- *Scheduling/eligibility information (S4-1.1)* – information on eligibility, routes, and schedules of area transportation services
- *Vehicle trip information (S4-1.2)* - riders and operators to obtain privacy-protected vehicle trip information (demand response)
- *Mobile Device accessibility (S4-1.3)* – version of the website compatible with personal digital assistants and smartphones (IE. iPhone, Palm Treo, Blackberry Curve)
- *Vehicle status/location (S4-1.4)* – dynamic updates on vehicle status based on geographic location. Could take form of the following:
    - Text-based ETA updates
    - Dynamically updating map
- *System status information (S4-1.5)* – dynamic updates on system status and disruptions for individual riders as well as providers
- *Disabled accessibility (S4-1.7)* – version(s) of the website accessible to riders with visual, hearing, and/or other disabilities (Bobby standards)
- *Non-English accessibility (S4-1.8)* – version(s) of the website accessible to riders who speak a language other than English
- *Trip request (S4-1.9)* – tool to enable riders to request/schedule trips
- *Customer feedback (S4-1.10)* – tool to report and record customer feedback

5.7.2. Hardware Components

- **NJ Find A Ride runs on a shared server** (will have to investigate what the average hosting site offers)

5.7.3. Software Components

- MySQL 5 or equivalent SQL database solution
- Red Hat Linux operating system or equivalent

- Apache Web Server or equivalent

5.7.4. Participating Providers, Personnel and Facilities

All Providers

- Advertising the TMCC One-Call Center website in their information and on their websites
- Provision and continued update of the latest schedule and route information to TMCC for inclusion into web portal

One-Call Center

- Develop and maintain web portal
- Obtain required hardware and software to run web portal

6. Applicable Documents