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

SYSTEM REQUIREMENTS

Submitted: February 15, 2008

RUTGERS
Edward J. Bloustein School
of Planning and Public Policy

Alan M. Voorhees
Transportation Center

Table of Contents

OVERVIEW 3

I. BACKGROUND AND SCOPE 3
II. VISION, GOALS, AND OBJECTIVES 3
III. EXISTING CHALLENGES 5
III. REFERENCED DOCUMENTS 7

PROPOSED TMCC SYSTEM 8

I. ONE-CALL TRANSPORTATION COMMUNICATIONS CENTER 8
II. COORDINATION OF PROVIDER TRIP FUNCTIONS 9
III. SEAMLESS FARE AND BILLING SYSTEM 10
IV. CUSTOMER SECURITY AND COMMUNICATIONS 11
V. FAITH-BASED FOUNDATION COLLABORATIVE FOR COMMUNITY TRANSPORTATION 12

REQUIREMENTS DEVELOPMENT 13

CHALLENGES IDENTIFIED AND CONFIRMED 13
TABLE TOP WORKSHOP 14
PRELIMINARY SYSTEMS REQUIREMENTS 19
One Stop Call for Service 20
Coordination of Provider Trip Functions 20
Seamless Fare/Billing 20
Customer Trip Information 20

SYSTEM REQUIREMENTS 22

NEXT STEPS 25

Overview

I. Background and Scope

The Camden County Workforce Investment Board (WIB), with the support of its local elected officials, local and regional transportation providers, state and local human services agencies, and in conjunction with the local United We Ride planning effort, is working with Camden County and the Alan M. Voorhees Transportation Center (VTC) at Rutgers University to develop a Travel Management Coordination Center (TMCC) that coordinates community transportation services through a comprehensive, technology-driven brokerage model.

The Camden County WIB is working to design a TMCC that will focus on effectively creating access for all transportation-disadvantaged consumers in Camden County to all local and regional modes of transportation, including local fixed and flexible routes, and local demand-response services across a multitude of providers including public transportation, county and municipal transportation providers, and local non-governmental organizations, including faith-based organizations. The expectation is that the Camden County stakeholders will establish a TMCC design that is deployment-ready for Title XIX medical transportation, and replicable and scalable to support integrating services to seniors and disabled, low-income individuals and the public for all travel needs.

Further, the support of the Delaware Valley Regional Planning Commission (DVRPC) and NJ Transit will ensure that system development will be consistent with the State and regional ITS architecture already established. The Camden County Stakeholders will provide recommendations for augmenting and altering the regional architecture and standards to incorporate human services transportation.

II. Vision, Goals, and Objectives

The overarching vision of this project is to design with Camden County the most effective transportation service delivery model by employing appropriate and current technologies focused on customer needs and the most efficient use of transportation and community resources. The Goals and Objectives of the project are as follows:

Goal 1: Develop a Travel Management Coordination Center (TMCC) for Camden County that creates opportunities for better and increased transportation service throughout the County.

- *Objective:* Investigate and utilize ITS technologies as a tool to facilitate transportation coordination in Camden County.

- *Objective:* Work collaboratively with Camden County public, private, non-profit, and faith-based organizations as partners in the development of the TMCC.

Goal 2: Increase access to existing human service and traditional public transportation for Camden County consumers.

- *Objective:* Develop improved marketing strategies targeted to consumers seeking human services transportation designed to create awareness for existing public transit and human service transportation.

- *Objective:* Examine the feasibility of reorienting human service transportation as feeder service to traditional transit services, as one means to improve the efficiency of the overall passenger transportation network in the County.

Goal 3: Implement a comprehensive, inclusive, ongoing and responsive project planning process.

- *Objective:* Form a stakeholder committee comprised of a diverse network of interested parties to meet periodically with the project team to review and discuss findings and project progress.

- *Objective:* Convene a small steering committee of select stakeholder committee members to work closely with the project team in the development of the TMCC.

- *Objective:* Provide a forum to solicit broad public participation from a variety of perspectives, including town meetings, focus groups and small working group sessions.

- *Objective:* Facilitate cross-communication between Camden County human service organizations (area nonprofits), faith-based organizations, transportation providers, government agencies and consumers, as a critical component of all project outreach efforts.

The project team recognizes the need to address the following issues, critical to the TMCC:

1. Facilitate greater coordination within the Camden County provider network.
2. Improve customer access to, and ease of use of, Camden County human services and the overall transportation system.
3. Simplify operational procedures across various Camden County transportation providers.

III. Existing Challenges

An extensive transportation network comprised of four primary types of transportation providers serves Camden County, including state and regional public transportation, county-based services, municipal shuttle services, and non-governmental organizations. These providers offer transportation services using the full spectrum of modalities including fixed route buses and shuttles, rail lines, flexible route shuttles, and demand-response shuttles. Human service transportation utilizes all of these types of providers and modalities. The current conditions found by the Camden County TMCC project team build upon the existing Camden County United We Ride Human Service Transportation Coordinated Plan which was approved by the Camden County Board of Freeholders in June 2007. Existing challenges faced by the Camden County human service transportation system that the CCWIB Team is attempting to address, include the following:

Suppressed Demand

Unmet demand for human service transportation exists in Camden County, particularly in southeastern rural areas of the county, and for specific trip purposes such as Medicaid and employment-related trips. For example, in Winslow Township, which is located in the southern region of the County, residents have difficulty tapping into public transportation. If they can get to Lindenwold Borough, they can go almost any where; but, without a car, getting to Lindenwold requires a $25 taxi ride one-way. Finding transportation options for traveling anywhere south of the Borough, where most of the new development in the Township is occurring, is impossible. The Camden County United We Ride Human Service Transportation Coordination Plan cited some of the following specific service gaps and needs:

- Expansion of Sen-Han services, currently, Sen-Han has extensive and increasing wait lists for medical transportation services that due to financial constraints they cannot meet demand.
- Increased employment shuttle services, including those that act as a feeder to/from rail lines. SJTA which provides employment trips like its medical counterpart Sen-Han cannot meet demand at its current financial constraints.
- Provide increased extracurricular/after-school youth transportation in communities with large transportation disadvantages.

Limited Service Area and Hours

Area traditional and human service transportation providers typically offer limited evening and weekend service, which limits the ability of customers to access employment or meet basic needs (such as shopping and social trips). For example, senior citizens in Pine Hill Borough have Borough-provided transportation to shopping and the bank on Mondays, Wednesdays and Fridays. They have transportation options that help them remain independent, but access to quality of life and cultural activities, such as high school plays and church sponsored dinners, held in the evening and on weekends that are free or discounted for seniors are out of reach to this population on a fixed income, due to lack of transportation. The Camden County United We Ride Human Service Transportation Coordination Plan cited some of the following service area and time gaps:

- Increased weekend bus service that addresses the needs of transit dependent populations.
- Creation of a core bus service in the City of Camden that runs 24/7.
- Increased transportation service in the southern and eastern parts of the county where very limited options and an expanding population currently exist.

Customer Communications

Currently, there is no one-stop transportation information access point in Camden County, which complicates trip planning for the users of public transit and human service transportation, as well as referring agencies. At a Camden County Mobilizing for Action through Planning and Partnership (MAPP) meeting held in September 2007, representatives of major health organizations, such as United Way, Women and Infant Children (WIC), American Cancer Society, and the Camden County Board of Social Services, were asked how their customers access transportation information. They responded that most of their clients do not have internet access; many receive transportation information by word of mouth through community networks; and some organizations provide transportation information to their clients. One agency noted that approximately 30 percent of their clients/patients are late for medical appointments due to transportation issues.

Limited Coordination among Area Providers

Limited coordination exists among Camden County's human service transportation providers. Opportunities exist to eliminate duplicative service and to extend service hours and geographic coverage through the coordination of public, non-profit, and faith-based organizations. The Camden County Workforce Investment Board is currently meeting with key leaders in the Camden City Faith-Based community to develop a Transportation Collaboration that will allow each Faith-based Organization (FBO) who chooses to participate to do so at a level they are comfortable. As part of the TMCC, most FBO participants will provide transportation linkages, such as between the neighborhood in which they are located and South Jersey Transit Authority cluster pick-up points.

Limited Integration of Human Service Transportation with Traditional Public Transportation

There is currently limited use of human service transportation to provide feeder service to traditional transit at key transfer points and transit stations. Currently, the Camden County Board of Social Services has a list of 16 transportation service providers. When a client qualifies for Medicaid transportation dollars and they have four or more medical appointments a month they are issued a transit pass for the month provided their trips can be completed by fixed route transit service; otherwise, their case manager simply calls the next human service transportation provider on the list, who in turn schedules a vehicle for curb to curb service. Linkage to existing transport service is not considered, and, often, these Medicaid trips run parallel to existing fixed route service.

III. Referenced Documents

Previous Reports

- Project Regulatory and Literature Review with bibliography
- Project Concept of Operations
- Camden County United We Ride Human Service Transportation Coordination Plan (2007)
- NJ Transit ITS Architecture Conformance Plan
- DVRPC Regional ITS Architecture (2001)

Existing scheduling, routing, dispatching, billing and reporting systems currently in use by Camden County providers

- Trapeze (Software Package)
- Paratransit Management and Scheduling (PtMS) (Software Package)
- Maintenance of client files

Stakeholder Input

- Leadership Council meeting summaries
- Focus Work Group (Camden City Initiative Committee of the Camden County Workforce Investment Board) meeting summaries
- Faith-based Work Group meeting summaries
- Focus group and listening session meeting summaries with entities including, but not limited to, parents of children enrolled in the Faith Tabernacle Labor Day Care program; participants of the Hopeworks youth initiative, which offers literacy, GED preparation and other youth-oriented programs to the community; members of the Pine Hill Borough Senior Citizen club; and residents of Winslow Township, which is located in the southern region of Camden County. Surveys of area transit users have been undertaken by the research team. (See Appendix B of the Concept of Operations for further details.)
- Research team meeting summaries with area transportation providers and other key entities, including the Delaware Valley Regional Planning Commission (DVRPC) and the Transportation Management Association, Cross County Connection

Proposed TMCC System

The proposed Camden County TMCC fits into five categories, which work together in a comprehensive manner to address the goals of this project. Although the descriptions of change are detailed, they do not describe specific methodologies or technologies, but instead describe the customer service and operational changes that can take advantage of appropriate technologies to improve service delivery.

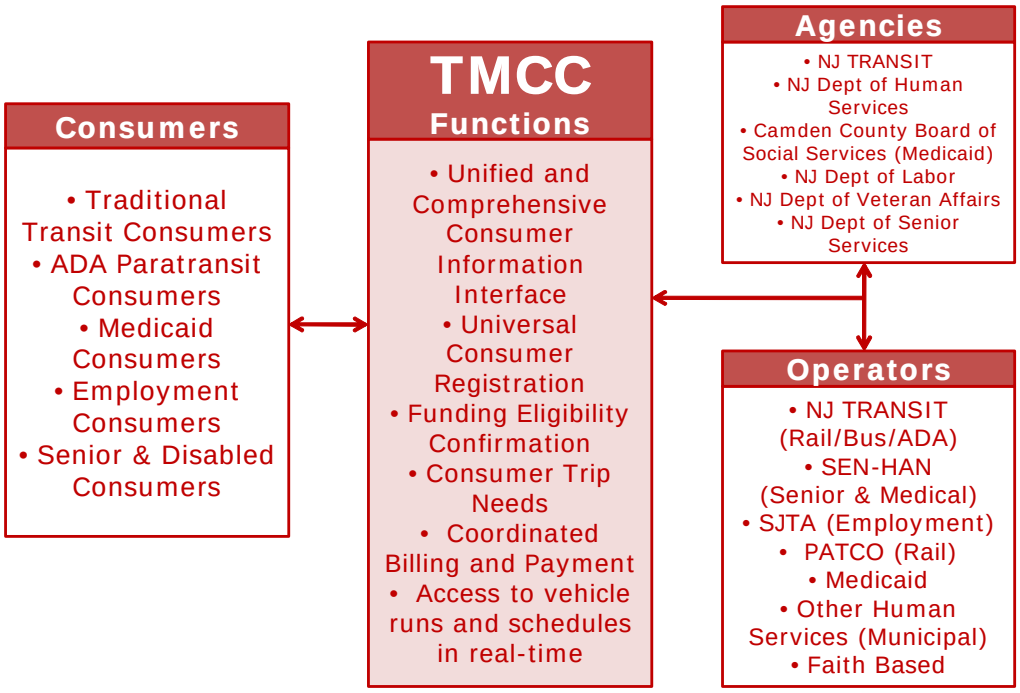

Figure 1. The above diagram displays a unified vision for the Camden County TMCC. It emphasizes the TMCC being the intermediary between Consumers, Operators, and Funding Agencies.

I. One-Call Transportation Communications Center

The One-Call Center in its initial phase will provide customers seeking passenger transportation service with a single phone number to call to discuss their mobility needs and receive help in qualifying for (i.e. funding eligibility) and identifying appropriate operator(s). An accessible website offering information on available services will also be provided. The One-Call Center will include:

- Providing a well-marketed phone number and website
- Having a One-Call Center office that is located near other advocate and funding agencies
- Having phone and web-based interfaces to other key information and referral agencies (i.e. 211, 511)

- Having trained live operators who understand the existing network of transit and human service transportation services and are prepared to assist consumers with varying needs and possible disabilities
- Having access to key provider agency eligibility, intake and trip scheduling functions to assist customers in reaching the appropriate provider(s)

Camden County has many different agencies and transportation operators that are involved with providing mobility for customers with a variety of demographic and social characteristics. Many have established relationships with agencies and operators that would be very difficult to transition to a new organization. For this reason, it is anticipated that existing customer service access points with individual operators will be maintained during the initial phase of the TMCC.

It is envisioned that the mobility manager/operator of the One-Call Center in its initial phase will establish close working relationships with existing major service operators, including Sen-Han Transit, SJTA and NJ Transit (rail, bus and light rail) and NT Transit Access Link, as well as key municipal, faith-based, and private livery operators who are positioned to provide needed transportation services.

The One-Call Center will have access to information including funding eligibility, hours and days of operation, and geographic service area, to be able to make informed decisions on whether a particular operator might be able to address a trip need identified by customer type, time frame requested, and geography.

II. Coordination of Provider Trip Functions

One goal of this project is to improve the efficiency of current provision of service by assisting operators in filling empty seats. Another key goal of this project is to work with the faith-based community to develop the ability of houses of worship to use their vehicles for community transportation, while allowing flexibility in their level of participation based on their priorities and availability.

As noted in the One-Call section above, there is a need to ultimately register the customer with all potential providers and to enable the TMCC to have access to the daily vehicle runs of participating operators so that new trips can be assigned to the most appropriate provider.

While initially this trip integration can be done by manual reassignments of passengers to the appropriate provider, ultimately Camden County operators will utilize current existing technology to automate this function. These technologies include:

Automated Vehicle Locator (AVL): This GPS system enables an operator to locate a vehicle on a computer screen map in an office to know where each vehicle is currently located. It becomes the basis for enabling mobile data computers, as well as customer update aids at key bus stops and at their homes (See Customer Security and Communications).

Mobile Data Computer (MDC): On-board computers can send passenger trip data back to the office, eliminating the need for time consuming reconciliation of hand written driver manifests and providing more detailed and accurate trip time and location data.

Scheduling and Routing Software: Software is essential to allow the TMCC and operators to share scheduling and routing information. Currently, the two scheduling and routing software packages being used in the County by major providers are PtMS used by Sen-Han Transit and the Trapeze system used by Access Link. Since the scheduling and routing software becomes the basis for any **Global Positioning System (GPS)** based technology including **Automatic Vehicle Locators (AVL)** and **Mobile Data Computers (MDC)** to communicate passenger trip data for more efficient reporting, the scheduling software must be able to accommodate these technologies, as well as allow communication of passenger trip and AVL data between operators and the TMCC.

III. Seamless Fare and Billing System

In order to achieve shared assignment of passengers to various operators, there is a need to assign the cost of a passenger trip based on some unit of cost. The system needs to:

- Assign the cost of the customer trip based on the operator unit cost back to an appropriate funding source
- Enable the operator to be paid for their cost of providing the customer trip
- Enable the customer to be billed (if appropriate) for their share of the cost of the trip

Currently, Camden County operators such as Sen-Han Transit have as part of their scheduling software a billing component that generates reports showing the number of trips to be billed back to a series of funding agencies. The need is to expand this capability so that multiple funding agencies and additional operators can be billed and paid, respectively, for their portion of customer trips.

This again emphasizes the need for an upgraded Scheduling Software that contains a billing component that enables the various unit costs of operators and the billing rates agreed upon for funding agencies to be maintained and ultimately managed by the TMCC.

Figure 2: Current Uncoordinated Fare Collection System

Figure 3: Coordinated Fare Collection System

IV. Customer Security and Communications

Two of the biggest challenges to serving customers through a more integrated system of providers are:

1. Ensuring the rider feels secure and confident in using the service
2. Providing the rider with information before and during their trip to contribute to their feeling secure and confident in making the trip

This is particularly true for serving customers with coordinated trips using a combination of human service and traditional transit operators. Following are some of the supports that contribute to a secure and confident customer trip experience:

- Provide the customer with next vehicle arrivals at key pickup/drop-off locations
- Provide enhanced security on the vehicle and at key pickup/drop-off locations
- Provide information about routes, schedules and provider contact information at key pick/drop-off locations
- Provide automated alerts and reminders to customers on trip delays and changes

These solutions range from low tech strategies, such as posted schedule information at key stops, to more advanced technologies, such as automated screens providing information on the next arriving vehicle or touch screen access to transit system information. Some of these technologies, such as the arriving vehicle information, build

on the GPS technologies that are used for locating vehicles and reporting vehicle customer data.

V. Faith-Based Foundation Collaborative for Community Transportation

For the past several years, the WIB has been working closely with the faith-based community around developing a project that enables houses of worship to use their vehicles in support of community transportation. This TMCC project is seen as a significant opportunity for faith-based organizations (FBOs) to enhance the existing countywide human service transportation provider network. Because technology brings significant flexibility for how transportation systems can be structured—whereby all information such as number of vehicles, availability of specific vehicles for trips by day/hours and type of services can be processed and coordinated—it became clear that the FBOs would have the flexibility of customizing their participation.

The WIB has convened a team of leaders from the faith-based community who developed the concept of creating a Faith-Based Foundation Collaborative for Community Transportation that would become the organizing framework for faith-based transit providers.

Requirements Development

The Camden WIB has engaged 159 stakeholders to establish a replicable and scalable TMCC design that is deployment-ready for Title XIX medical transportation services for seniors and disabled, low-income individuals and the public for all travel needs. Unique to Camden County's TMCC design is the establishment of a Faith-Based Foundation Collaborative for Community Transportation that will provide additional transit services particularly in those areas where limited transportation exists. To help inform the design of the TMCC, more than a dozen focus groups were convened along with nearly 250 on-street and community surveys.

Challenges Identified and Confirmed

From the initial Leadership meeting and elaborated, illustrated and confirmed upon in subsequent Key Stakeholder, Technical Group Work sessions, and outreach activities, the Camden WIB team is building upon the needs and issues identified in the 2007 United We Ride (UWR) County Coordinated planning process, which included the following:

- Suppressed Demand
- Limited Service Area and Hours
- Poor Customer Communications
- Limited Coordination among Area Provider/Operators
- Limited Integration of Human Service Transportation with Traditional Public Transportation

Reverend Timothy Merrill (left), East Camden Community Fellowship Church, and Father Joseph Messina, CC WIB Faith Based Liaison, were two of many participants at the Transportation Orientation held June 28th. Post meeting networking (right) occurred after the August 23rd Leadership Council meeting.

Mr. Anthony Lingo, Manager of Special Grants Projects for the City of Camden, addresses the Leadership Council. Also seated at the head table are Ms Pippa Woods, Project Development with the Alan M. Voorhees Transportation Center at Rutgers; Yehuda Gross, ITS Transit Program Manager for the US Department of Transportation; and Mr. Jack Gallagher, Chairman of the Board, Camden County Workforce Investment Board .

The extensive transportation network in Camden County, comprised of four primary types of transportation operators, including state and regional public transportation, county-based services, municipal shuttle services, and non-governmental organizations, offer transportation services using the full spectrum of modalities including fixed route buses and shuttles, rail lines, flexible route shuttles, and demand-response routes. To balance the strong input from the outreach activities (focus groups, street interviews etc), individual meetings were also held to focus and discuss these 5 challenges specifically so that the CCWIB Team was clear and focused on how these challenges affect and impact each operator and funding agency. The existing challenges noted above therefore focus the technical work and lead directly to the development of the proposed TMCC Systems Requirements.

Table Top Workshop

The general and specific outreach to Camden County citizens (detailed in Appendix B of the Concept of Operations, Rev. January 18, 2008) informed and illustrated specific issues in a way that assisted the CCWIB Team in crafting a day-long 'Table-Top' Workshop with the entire Technical Work Group (33 members) held December 12, 2007. The purpose of the workshop was threefold:

- To confirm the current transportation needs in Camden County
- To identify key functions for a Camden County Travel Management Coordination Center (TMCC)
- To creatively and collaboratively design a TMCC for Camden County

Bringing together all of the data, individual meeting summaries and outreach response collected and analyzed to date, the CCWIB team generated several tools and exercises to work through with the Technical Group to generate a collective understanding of **'what is needed'** to operate a TMCC for Camden County. Table 1 'What is Needed' below, was critical in outlining the key concepts that underpin the project. Column 1, 'Need' reflects the challenges identified in the UWR Plan (Approved by the County Freeholders in June 2007). Column 2 'Function/Action' outlines, in no specific order, grouping or priority, basic trip making functions/actions that a rider, operator or funding agency make. Column 3 offered early thoughts as to some of the technologies that can facilitate or accomplish the actions -- the "how" the actions listed in Column 2 might be accomplished. It should be noted that the focus of this Table Top Workshop was Column 2, and that the outcome of the Workshop was anticipated to be consensus on the higher level system requirements. Column 3 was there as much to avoid getting sidetracked into technology discussions with the sophisticated operators present in the Workshop. By listing some of the ultimate technology tools, we planned to maintain the Groups' focus for the day.

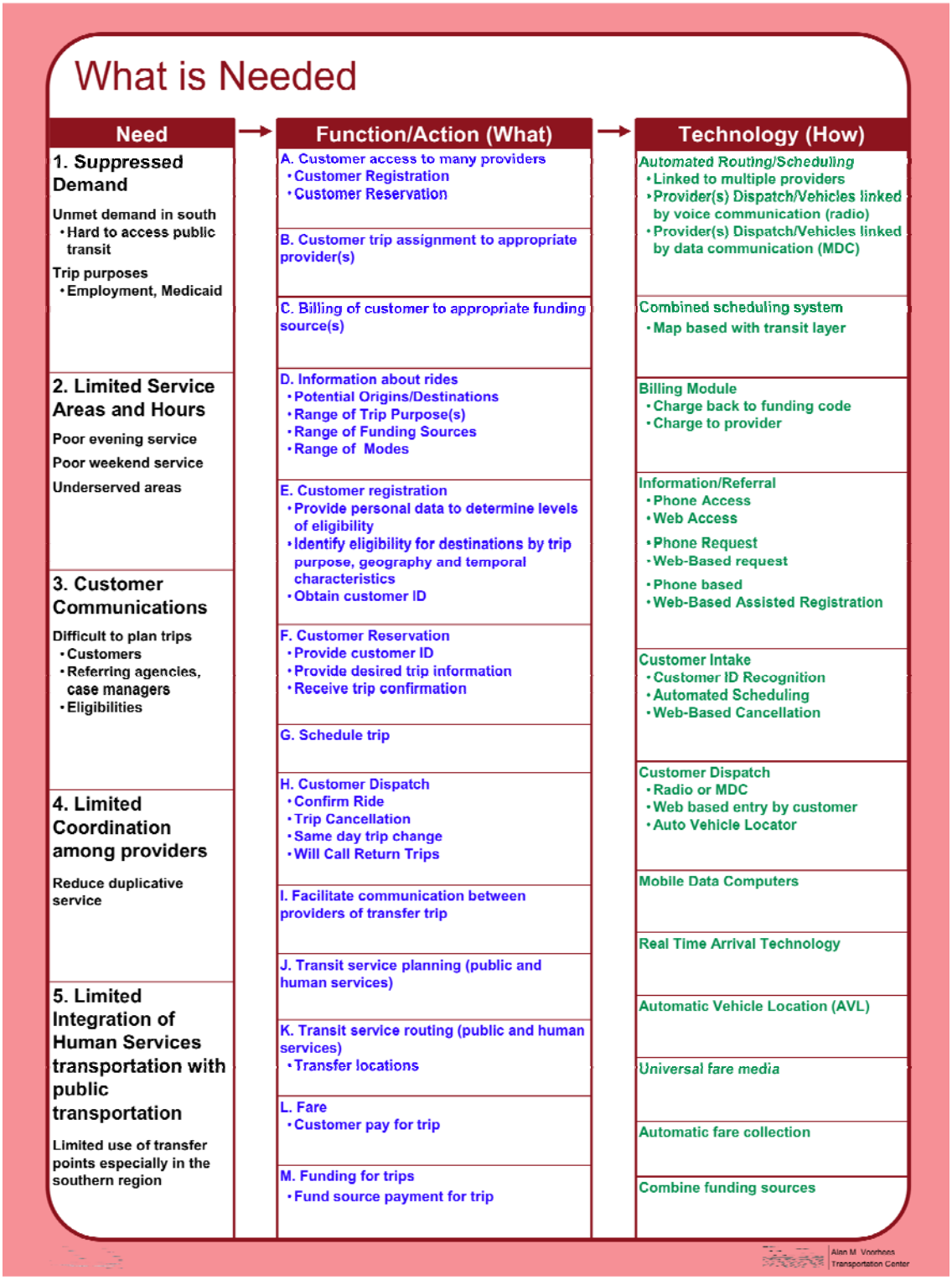

Table 1: What is needed to build the Camden County TMCC was a useful tool in guiding the participants in the Table Top exercises.

Exercise 1 – Needs and Functions
Using Table _ above, the first Exercise engaged the whole group to confirm the NEEDS in Column 1 and focus on FUNCTIONS/ACTIONS in Column 2 to identify and discuss missing details and agree to add those details appropriately.

Exercise 2 – Functional Requirements Completion
Exercise 2, participants broke into 3 groups with each group taking the Functions from Exercise 1. Half the group took the perspective of a rider, and the other half took the perspective of the operator. On a flip chart, each group developed key requirement statements for each of the functions. The focus was on trying to get several statements for each of the functions. We allowed that these statements could cover either:

- Overall system requirements - answering the question "what?"
- Performance requirements – answering the question "how well?" or
- Other requirements – answering the question "under what conditions?"

To assist the group, we provided several examples, as follows:

Sample Key Requirements

Function A. Customer access to many providers
✓ *The system shall provide a single phone number for the customer to access all providers*
Function F. Customer Reservation
✓ *The system shall enable the customer's reservation record to be brought up by a customer ID number* ✓ *The system shall be capable of maintaining a customer trip record for a minimum of 90 days*

At the end of this Exercise, each group presented their list of key requirements to the whole, and commonalities, difficulties, clarifications were discussed. A preliminary list of high level requirements for the proposed Camden County TMCC System were generated through this Exercise and are captured at the end of this section, grouped within the key system requirements.

Exercise 3 – Scenario Building
The final exercise again engaged the full group in role-playing through a TMCC Scenario, which generated many good refinements and a better appreciation for the complexity of a 'one call' vision. A simple diagram was used to illustrate this scenario (diagram _), as well as a detailed description of the Scenario (outlined below). Each participant was asked to take a role, and play through several different call situations, focusing on capturing the following concepts:

- What information is useful to fulfill most of these information type calls?
- What information is needed to assist customers with trip planning?
- What might be the next most useful functions that this information based TMCC could supply for customers?

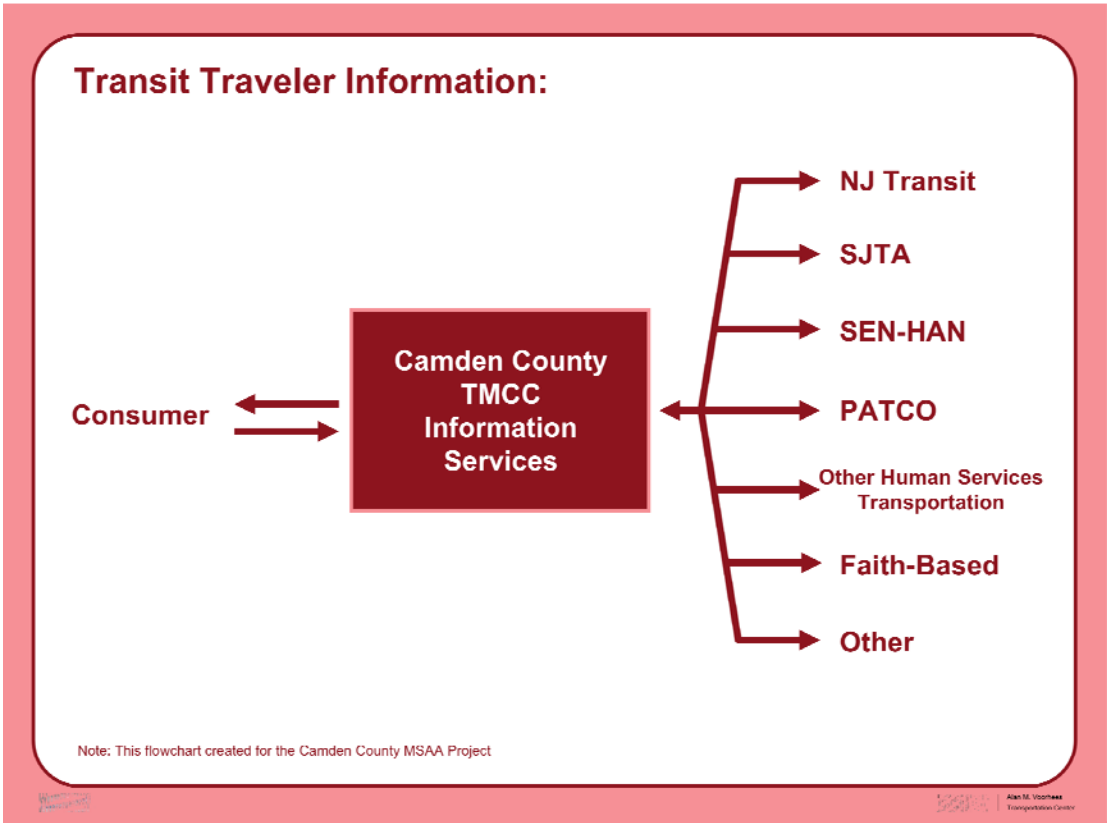

Figure 4: Delivery of transit travel information as envisioned for the Camden County TMCC.

Scenario

- **The Camden County TMCC has been funded and is open for business**
- **The Camden County TMCC is the 'one-stop' call center for Camden County**
- **Customers access the TMCC by calling 211, or on-line at 'NJFindaride'**
- **The TMCC is staffed by a Mobility Manager, funded by FTA 5310 funds**
- **The TMCC is housed at Cross County Connection (TMA)**
- **The TMCC serves primarily as information resource center and referral agent**
- **The TMCC has GIS based tools to display most up-to-date human services transportation and transit routing information and schedule**
- **The TMCC/has/uses the web-based 'NJFindaride' trip planner which has been customized for Camden County Region to assist customers in trip planning**
- **The TMCC has a database of all current Service providers (and their customer lists)**
- **The TMCC has the current Medicaid eligible client list**
- **The TMCC has the Faith Based Foundation/Collaboration's trip purpose and availability outline (e.g. specializing in senior group trips mid-day, weekdays, youth after school)**

The following details were confirmed before starting the role-play.

- ✓ Marketing and information has been disseminated throughout the county so that whenever you need information about getting a ride, call 211 or visit NJ findaride.org.
- ✓ TMCC mobility manager/staff will take series of calls from customers and take appropriate actions.
- ✓ While customers and transit riders continue to call the services and providers that they have been used to calling, new calls now come to the new TMCC. Many of the calls are seeking information, not necessarily trips.

For each of the roles below, a definition and a check list of functions and actions that the proposed TMCC scenario would include (building from the previous exercises), as well as a list of potential Customer's trips from Medicaid, JARC, general public, veterans affairs, senior, person with disability were provided. Those taking the Customer roles were specifically asked to add their personal experience to expand upon the possibilities included in the sample trips listed.

- Customers (5 – rider, caseworker)
- TMCC (3)
- Operators (5 -1 transit agency, 1 faith-based, 1 liver/Medicaid, 1 Sen-Han, 1 AccessLink)
- Funders (2)

Several sample calls were provided.

Sample Call 1:
Call comes in from new resident of Cherry Hill
Asks about best way to make a work trip to Trenton
TMCC asks customer for home location
TMCC notes if home location is on, close to a bus route, consults bus routing map on-line, provides bus trip number etc, and suggests RiverLine Light Rail, and provides schedules and fares.

Sample Call 2:
Another call comes from someone looking after an elderly person
Client is usually taken by Sen-Han, but the caretaker doesn't know what 'sen-han' is
TMCC asks for customer's name, when she is looking for the trip – checks and confirms that her name is on Sen-Han Customer list – gives the caretaker Sen-Han's number for future reference, while
TMCC calls Sen-Han on another line to facilitate trip request for caller
SenHan confirms trip with customer

Preliminary Systems Requirements

Project outreach and Table Top Exercises have allowed us to confirm, refine and organize our needs into five overarching system elements:

- Establish a 'one-stop transportation communications center' 'call' function for services that will allow users to access all transportation services through one action, making customer trip information more available to riders;
- Coordinate service provider trip functions;
- Implement a seamless fare/billing system for all transportation services in Camden County;
- Enhance customer security and communication; and
- Establish a Faith-Based Foundation Collaborative.

The preliminary list of system requirements developed through the December Table Top exercises are outlined below:

One Stop Call for Service

Camden County TMCC Shall. . .

- Have a single point of contact (phone number, website)
- Determine customer eligibility for all appropriate funding sources
- Provide all eligible provider options, while maintaining choice
- Enable customer to provide information on their travel limitations
- Identify customer trip purpose, O-D
- Be able to transfer customer request to appropriate provider
- Have a live operator
- Receive information updates from providers on a scheduled basis
- Assign a single customer ID code for all programs
- Accommodate changes in customer need and eligibility

Coordination of Provider Trip Functions

Camden County TMCC Shall. . .

- Register the consumer with all providers
- Have access to all of the daily vehicle runs for all provider agencies
- Have access to the location of provider vehicles in order to assign trips in real time
- Enable the recording of passenger trip information for funding agency reporting

Seamless Fare/Billing

Camden County TMCC Shall. . .

- Identify the level of unit cost for all provider agencies
- Have a mechanism for assigning shared costs between agencies funding riders on the same vehicle trip
- Enable the provider to be reimbursed from multiple funding sources

Customer Trip Information

Camden County TMCC Shall. . .

- Provide vehicle arrival/departure information at customer pick-up/drop-off locations

- Provide enhanced security for consumers on the vehicle and at key pick-up/drop-off locations
- Provide transportation system information at key locations about routes, schedules and provider contact information
- Provide automated alerts and reminders to customers

System Requirements

High level system requirements were organized into a Needs-to-Requirements Matrix. Three levels of requirements are presented. Backwards traceability is documented up to higher-level requirements and user needs. Forwards traceability is documented down to lower-level requirements. During future stages of the study, requirements will trace forward to verification tests and detailed system design elements. In addition, cross-dependencies between requirements are traced in the column titled Traceability. Requirements are grouped under one of four System Needs derived from the Proposed System Elements presented in the Concept of Operations:

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

The following definitions apply to the Matrix:

System Needs: The System Needs column provides backwards traceability to the Concept of Operations. Note that we have changed the order of System Needs to better reflect project refinement and priorities.

ID: Each requirement has been assigned a unique identification code. System requirements are differentiated from user requirements by the use of the letter S (System) and U (User) at the beginning of the code. Child and grandchild requirements are designated within the identification code, so that a child of S1-1 is S1-1.x, and a grandchild of S1-1 is S1-1.x.x.

M/D: The M/D column represents whether that requirement is Mandatory (M) or necessary for the implementation of a TMCC that addresses all four User Needs, or Desirable (D) to provide the greatest user benefit.

Traceability: The Traceability column documents cross-dependencies between system requirements.

System Requirements for the Camden County Travel Management Coordination Center (TMCC)

System Needs	ID	Level 1 System Requirement	M/D	ID	Level 2 System Requirement	M/D	Traceability	ID	Level 3 System Requirement	M/D
One Stop Call Center - The TMCC Shall:										
3.1.4	S1-1	Provide information about transportation services to riders and operators via a web site	M	> S1-1.1	Provide information on eligibility, routes, and schedules of transportation services	M				
				> S1-1.2	Enable riders and operators to obtain privacy-protected vehicle trip information	M	S2-1.5			
				> S1-1.3	Provide a web site that is accessible to personal mobile devices	D				
				> S1-1.4	Provide information on vehicle trip status and updates based on vehicle's geographic location	M	S2-2.1			
				> S1-1.5	Provide information on system status and disruptions for riders and operators	M	S2-2.1			
				> S1-1.6	Enable riders accessing www.njfindaride.org to link to the TMCC web site	M				
				> S1-1.7	Provide a web site that is accessible to riders with visual, hearing, and/or other disabilities	M				
				> S1-1.8	Provide a web site that is accessible to riders who speak a language other than English	M				
				> S1-1.9	Record and report customer feedback	M				
3.1.4	U1-1	Enable riders to link to the TMCC from their personal computer	M	> U1-1.1	Enable riders to access information about transportation services	M				
				> U1-1.2	Enable riders to request an eligibility determination	M	S1-1.1			
				> U1-1.3	Enable riders to request/schedule a trip	M				
				> U1-1.4	Enable riders to check on status of their scheduled trips	M	S2-2.1			
				> U1-1.5	Enable riders to access the estimated arrival time of their scheduled trip	M	S2-2.1	> U1-1.5.1	Update the estimated arrival time not more than once per minute	M
3.1.4	U1-2	Enable riders to obtain travel information by telephone	M	> U1-2.1	Enable riders to speak with a live operator who is trained on the existing array of transportation services	M				
				> U1-2.2	Enable riders to obtain travel information by telephone without speaking with a live operator	D				
				> U1-2.3	Enable riders to record requests when a live operator is not available	M				
				> U1-2.4	Enable riders to request determination of eligibility for funding sources	M	S1-1.1			
				> U1-2.5	Enable riders to make trip reservations with operators via telephone	M				
				> U1-2.6	Enable riders with visual, hearing, and/or other disabilities to access the telephone system.	M				
				> U1-2.7	Enable riders using a language other than English to access the telephone system	M				
3.1.4	S1-2	Provide link to State 211 and 511 Systems	M	> S1-2.1	Be able to accept calls from the 211 and 511 systems	M	U1-2.1			
				> S1-2.2	Be able to transfer calls to 211 system	M				
Coordination of Provider Trip Functions - The TMCC Shall:										
3.1.3	S2-1	Have a software package that enables coordination and automation of TMCC and operator functions	M	> S2-1.1	Have a software package that provides access to all of the daily runs for all operators	M				
				> S2-1.2	Have a software package enabling both the TMCC and operators to take customer registration based on eligibility	M				
				> S2-1.3	Have a software package enabling both the TMCC and operators to take customer trip	M				
				> S2-1.4	Have a software package that enables repeated or subscription trips (anchored on fixed	M				
				> S2-1.5	Have a software package that automatically assigns trips to vehicle runs	M		> S2-1.5.1	Have a software package that enables vehicle run creation based on bundling of passenger trip requests	M
								> S2-1.5.2	Have a software package that enables trip insertion by the operator dispatch personnel	M
				> S2-1.6	Enable the scheduling software to produce a vehicle trip manifest in either trip pick-up order or drop-off order	M				
3.1.3	S2-2	Provide to the TMCC and the operators access to the geographic location of operator vehicles	M	> S2-2.1	Have vehicle geographic location transmitted from each vehicle to the base location	M		> S2-2.1.1	Update vehicle location at not more than once per minute	M
				> S2-2.2	Enable the geographic location of vehicles to be shown on Geographic Information System (GIS) generated maps on a computer screen	M		> S2-2.2.1	Enable the TMCC and operator dispatchers to view the location of all operator's vehicle fleets on a computer screen	M
3.1.3	S2-3	Enable the recording and transmission of information between the vehicle and the TMCC and operator dispatch personnel	M	> S2-3.1	Enable the driver to receive his/her manifest of trips on a computer display	M	S2-1.5			
				> S2-3.2	Enable the operator dispatcher to transmit changes to the vehicle trip manifest	M	S2-1.5			
				> S2-3.3	Enable two-way communications between driver and operator base	M				
				> S2-3.4	Enable vehicle and passenger data for individual passenger boarding and alighting location and time to be frequently transmitted back to the TMCC and operator reporting software module	M	S2-1.1			

Seamless Fare and Billing - The TMCC Shall:											
3.1.2	S3-1	Be able to assign shared costs between multiple funding agencies that pay for passengers on the same vehicle trip	M	>	S3-1.1	Enable different levels of unit cost to be assigned for each operator based on their total transportation cost components	M				
				>	S3-1.2	Enable individual funding agency cost assignments to be determined based on the units of service (passenger hours or miles) carried by individual operators	M				
				>	S3-1.3	Enable the individual trips to be attributed to individual agency billing codes	M				
3.1.2	U3-1	Enable the rider to pay individual operators electronically	M	>	U3-1.1	Enable the cost of the operator trip to be charged back to a combination of the rider account and/or funding agency accounts	M				
3.1.2	S3-2	Enable the operator to be reimbursed by multiple funding agencies	M	>	S3-2.1	Enable the operator to have a means of electronically recording the unit of service provided to the rider	M				
				>	S3-2.2	Enable the operators to generate a report totaling the rider trips by funding category	M	S3-1.3			
				>	S3-2.3	Enable the operator units of service to be billed to the various funding agencies or riders	M	S3-1.3			
				>	S3-2.4	Enable the TMCC to maintain a back-up copy of trip and transaction records	M				
Rider Information and Security - The TMCC Shall:											
3.1.1	S4-1	Enable the TMCC to provide access to arrival, departure and delay information for individual vehicle trips	M	>	S4-1.1	Enable the vehicle geographic location to be transmitted from the vehicle	M	S2-2.1			
				>	S4-1.2	Enable the vehicle geographic location to be translated into expected arrival time information	M	S2-2.1			
				>	S4-1.3	Enable the expected arrival, departure and delay information to be displayed on the TMCC	M	U1-1.1			
				>	S4-1.4	Enable vehicle location data and arrival, departure and delay information to be displayed at key stops/locations	M	S2-2.1			
				>	S4-1.5	Enable vehicle arrival, departure and delay information to be made available to riders via telephone system	M				
3.1.1	U4-1	Enable the rider to access transit system information and individual trip information from key stops/locations	M	>	U4-1.1	Enable the rider to obtain information on routes and schedules from the TMCC rider information service from their operators	M	S1-1.1			
				>	U4-1.2	Enable the rider to access their scheduled trips with operators	M	S1-1.2			
				>	U4-1.3	Enable the rider to obtain expected vehicle arrival, departure and delay information	M	S1-1.2			
3.1.1	S4-2	Provide enhanced security for riders on vehicles	M	>	S4-2.1	Provide on-vehicle cameras that can record event data	D		>	S4-2.1.1	Record event data activated by a vehicle event	D
									>	S4.2.1.2	Record event data activated by the vehicle driver	D
									>	S4-2.1.3	Enable the recorded event to be downloaded to an operator-based computer for review	D
				>	S4-2.3	Enable the driver to alert the dispatcher of an on-board emergency	M				
				>	S4-2.4	Enable the driver to contact 911 in the event of serious emergency	D				
3.1.1	S4-3	Provide enhanced security for riders at key stops	D	>	S4-3.1	Provide security cameras at high crime stops	D				
				>	S4-3.2	Provide 24-hour monitoring of security cameras	D				
				>	S4-3.3	Enable riders to report emergencies from key stop locations	D				
3.1.1	S4-4	Provide transportation information at key stop/locations about routes, schedules, and operators	M	>	S4-4.1	Enable the TMCC rider information services to be accessed via electronic request	M	S1-1			
3.1.1	S4-5	Provide automated alerts and reminders to riders	M	>	S4-5.1	Provide automated telephone messages on trip updates to registered riders	M	S2-2.1			
				>	S4-5.2	Provide automated text messages (SMS) on trip updates to registered riders	D	S2-2.1			

Sx-x = System Requirements | Ux-x = User Requirements | M/D = Mandatory/Desirable

** Note - System Elements reference the 18 January 2008 Concept of Operations*

Next Steps

The project team is continuing to advance the design activities. Next steps in building the model for the Camden County TMCC include:

- Circulate and walk through the System Requirements with key Stakeholders.
- Schedule Stakeholder meetings to move forward discussion on Hi Level Requirements and detailed design.
- Schedule one-on-one meetings with operators and funding agencies.
- Advance self assessment reference matrix for Faith-Based organization travel requirements.
- Refresh the evaluation criteria for initiative measurement of progress.