

Mobility Services for All Americans (MSAA): Integrating Human Service Transportation in the Mobility on Demand (MOD) Future

Rik Opstelten, Federal Transit Administration

Murat Omay, Federal Transit Administration

Carol Schweiger, Schweiger Consulting

Dawn Hardesty, Noblis

The Mobility on Demand Future: The Philosophy behind Integration

The US DOT's Mobility on Demand (MOD) program is rooted in the knowledge that America's communities are made stronger when all people have access to carefree, safe, reliable, transportation, regardless of where they live, who they are, and what their travel needs are.

Realizing the MOD vision requires the collaboration of a full range of transportation options (e.g., public, private, human service transportation) to offer the greatest possible level of mobility within regional transportation systems. Through collaborative multi-provider and multi-option platforms, the objective of MOD emerges to not only provide a "basic" service, but one that improves the mobility of all Americans by increasing the number of available transportation options, enhancing their usefulness to the populations they serve, and offering new levels of affordability and reliability due to effective/efficient operations. In combination, these features serve as essential elements for filling significant gaps in transportation services, especially for transit-reliant populations in areas where those services are heavily fragmented, unaffordable, and unreliable.

Maximizing the usefulness of transportation resources, and filling gaps in mobility creatively is at the heart of Mobility Management, a concept long advanced by US DOT defined as: "a customer-centered approach to finding transportation solutions for all populations with a particular focus on people with disabilities, aging populations, English-language learners, low income communities, and other groups with unique needs."¹

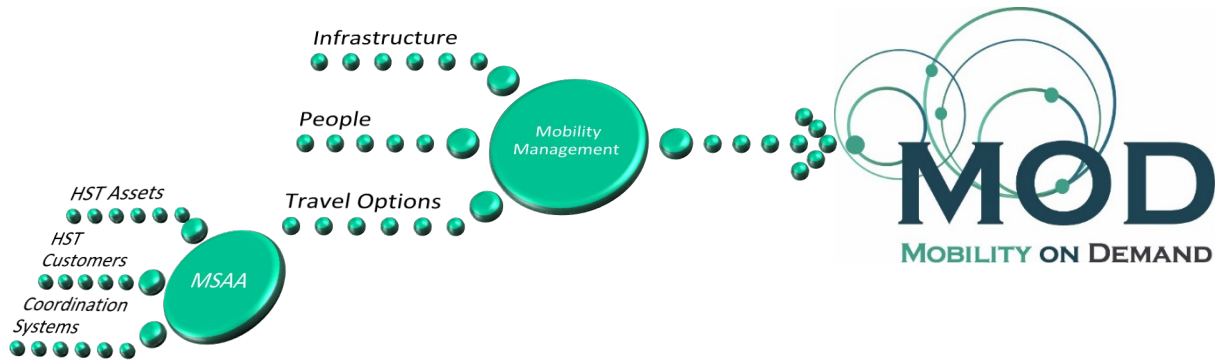
Mobility Management takes a holistic approach to the community-wide transportation network, identifying opportunities to increase the efficiency of current operations and infrastructure, while seeking innovative approaches to bridging any gaps in the transportation network. Mobility Management is characterized by a focus on individual needs, not on moving the masses, and on innovation, changing usual business practices.² Built around the principles of individual-centric perspective of Mobility Management concept, Mobility on Demand takes the person-centered approach

¹ National Center for Mobility Management and Corporation for National and Community Service Senior Corps Program, "Mobility Management: Introduction, Implementation, Community Service and Seniors," prepared for the Federal Transit Administration, August 2017, page 2

² Elizabeth Ellis, Mobility Management, prepared for AARP Public Policy Institute, October 2009, © 2009, p. 1, https://assets.aarp.org/rgcenter/ppi/liv-com/roundtable_091013_mobility.pdf

to integrate and create mobility options to a new level **expanding it to the serve the broader population.**

MSAA concepts are key tools of mobility management; presenting an opportunity to better leverage Human Service Transportation (HST) resources and serve HST populations. Understanding the



background of the MSAA Initiative helps show how MSAA’s concepts facilitate mobility management and help eventually realize the MOD vision.

The Vision of Mobility Services for All Americans (MSAA)

The goal of MSAA is to improve access to employment, healthcare, education, recreation, and other community activities for people with special transportation. This is done by coordinating and integrating HST and community transportation resources to create more effective mobility options.

MSAA advances the state-of-the-art in comprehensive traveler support; interoperable and coordinated transportation operations and management; and streamlined program management requirements addressing both technical and institutional barriers to coordination.

US DOT has laid out a phased approach to meeting the MSAA vision:

- **Stage 0: Current Conditions.** Facilitating more transportation options could improve travel. With advancements in technology and improved systems, obtaining a ride could be both efficient and seamless. Current service provisions require impractical advance reservation times as well as models that are based on published (and outdated) information instead of real-time information on critical trip elements such as availability, schedules, demand, vehicle options, etc.
- **Stage 1: System Interoperability.** In Transportation Management Coordination Center (TMCC) models, there is one number to call or one website to access for travel needs, regardless of destination, trip purpose, or time. The local TMCC provides a traveler with various transportation options (via phone or Internet). The ride is scheduled by the TMCC, the rider is notified about the arrival time of the ride, before the ride arrives, and any changes to the planned arrival time, if any..
- **Stage 2: Multi-Modal Accessibility and Traveler Connectivity.** A TMCC mobile application allows travelers such as someone with a visual impairment the option for standing order trips or demand-response trips. Because it is connected to the TMCC and communication/information network, the traveler’s information and choices are updated in real-time.

- **Stage 3: Real-Time and Information-based Spontaneous Transportation.** The mobile application extension of TMCC allows travelers, such as someone with a cognitive disability, to request trips in real-time. Because it is connected to the TMCC network, the user's profile with contact information and current location are identified by the system. The user simply uses the mobile application for spontaneous travel request, along with the type of vehicle he or she needs. The TMCC system runs the requests through the network and notifies the traveler about which option would arrive the quickest based on the traveler's profile, real-time choices, and program qualifications.
- **Stage 4: Mobility on Demand.** With MSAA and MOD improvements to person-centered travel options, barriers to mobility are eliminated. Enablers such as integrated payment, vehicle automation and accessibility-enhancing personal technology have come together to make the Complete Trip accessible for all people.

Mobility Services for All Americans produces benefits for many: simplified trip-making for riders, effectiveness for service planners, efficiency for operators, and streamlined management for human service programs. In addition to the obvious localized impacts of these benefits, the aggregated outcomes also provide positive regional and National impacts, not only from a quality of life perspective by improving social and healthcare aspects, but also advancing equity, accessibility, productivity, workforce participation and economic strength.

Realizing the vision of MSAA requires establishing partnerships among the agencies and organizations that provide and pay for transportation and developing technology-based systems that support person-centered coordination of those resources. Figure 1 illustrates the different components and stakeholders of the MSAA and TMCC collaborations.



Photo Credit: Pressfoto - Freepik.com

Figure 1. How MSAA Works

Such complex systems must be developed in a structured way to “synchronize” the essential elements involving the demand, supply, payment, and information. The TMCC systems, therefore, aim to integrate the traveler (demand), service provider (supply), relevant funding programs (payment), and the data flow between them (information). Development of such systems requires a systematic approach that involves key elements from the V-Process of Systems Engineering, as shown in Figure 2.

- Bringing together the stakeholders and potential users
- Understanding and documenting their needs
- Defining those needs iteratively in high-level and detailed design documentations
- Developing system requirements to address the documented needs

- Procuring the system components and subsystems based on the developed system requirements
- Implementing these systems by iterative testing and validating that they function as intended, and
- Verifying that the system meets the identified and documented stakeholder needs

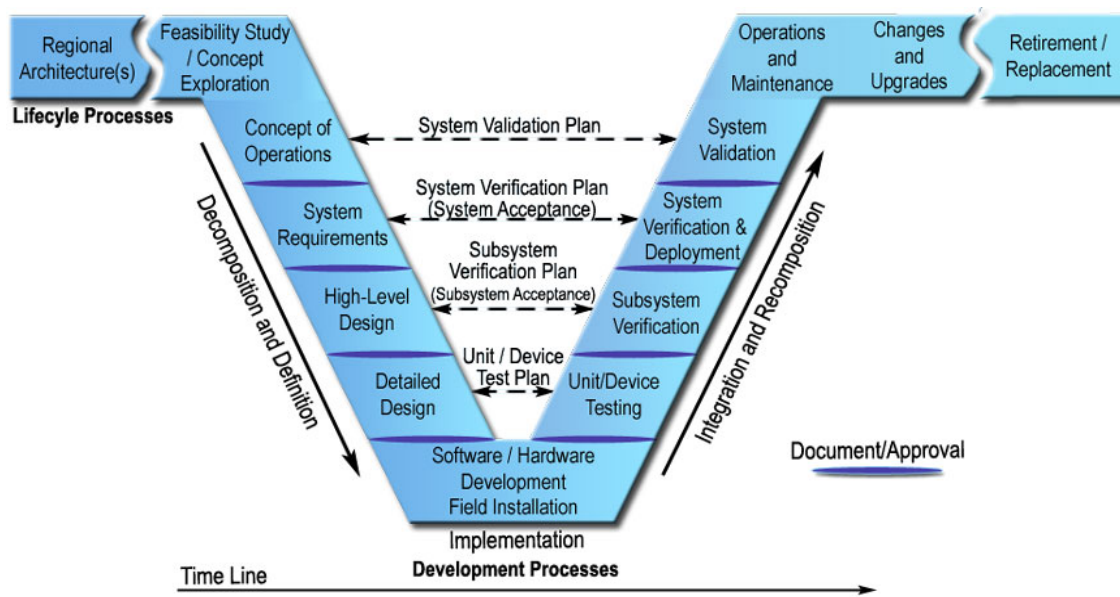


Figure 2. V-Process of Systems Engineering for TMCC Planning and Design Framework³

The History of MSAA

There are over 80 Federal programs that fund transportation services for the public and transportation disadvantaged. The recognition that this situation created barriers to transportation coordination, among other issues, led to the February 2004 Presidential Executive Order⁴ on Human Service Transportation Coordination which established the Federal Interagency Transportation Coordinating Council on Access and Mobility (CCAM) to enhance accessibility and mobility for persons who are transportation-disadvantaged, especially individuals with low-incomes, people with disabilities, and older Americans. This Council is chaired by the Secretary of Transportation with representation from 11 executive departments or agencies of the Federal government. The Executive Order requires all Federal agencies to work together to enhance transportation access, minimize duplication of Federal services and facilitate the most appropriate, cost-effective transportation for older adults, people with disabilities and low-income populations.

³ U.S. DOT FHWA Systems Engineering for Intelligent Transportation Systems (Figure 7: Systems Engineering "V" Diagram) <https://ops.fhwa.dot.gov/publications/seitsguide/section3.htm>

⁴ Executive Order 13330

After the creation of the CCAM, USDOT launched the MSAA Initiative with funding from the Intelligent Transportation Systems (ITS) Joint Program Office (JPO) to apply ITS solutions to HST delivery. From 2006 to 2014, three distinct phases of MSAA were accomplished:

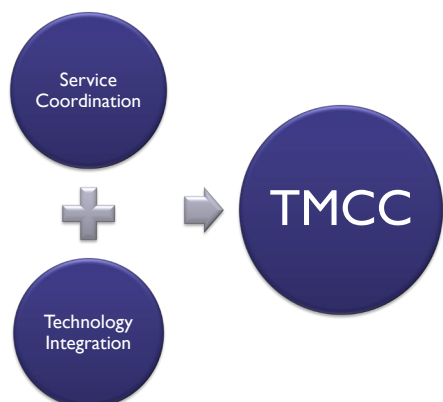
- Phase 0 - Foundation Research
- Phase 1 - Deployable Model System Designs, and
- Phase 2 - Model Deployment of Select Travel Management Coordination Centers

The Foundation Research phase determined that “the ‘ideal’ system to assist in the improvement of human services transportation (HST) would be a replicable, scalable TMCC; this center could exist physically or virtually.”⁵

In late 2006, eight project sites⁶ were funded to a high-level system design for a TMCC specific to their region and operations, and provided related technical assistance to support their work.

The result from Phase 1 was develop seven ‘deployment-ready,’ replicable, and scalable detailed system designs for models of TMCCs that deliver enhanced human service transportation across a variety of operational environments and scenarios.²

These demonstrations proved that a TMCC could provide one-stop, unified, customer-based travel information and trip planning services, and support coordinated human service transportation. Building on the success of Phase 1 and 2 efforts, a round of MSAA Deployment Planning grants were awarded to the following four agencies in 2015:



1. **Northwest Metro Denver Coordination System – Via Mobility Services:** This project is expanding Via Mobility Services to other urban communities within the Northwestern Denver Metro Area (Northglenn, Federal Heights, Broomfield, and Thornton). This project builds on the Denver Regional Mobility and Access Council (DRMAC’s) Veterans Transportation and Community Living Initiative (VTCLI) Trip Exchange Project.
2. **San Luis Obispo County TMCC - United Cerebral Palsy of San Luis Obispo/Ride-On Transportation:** This project will enhance personal mobility using Common Fleet Information Platform through TMCC’s real-time Ride Coordination System (RCS) across the county.
3. **Simply Get There Trip Triage Design – Atlanta Regional Commission (ARC):** The extension of ARC’s ‘One-click/One-call (OC/OC) project is to develop an open-source Atlanta Region Travel Management Coordination Platform (TMCP), which is designed for the complexity of HST trip transactions
4. **Travel Management Coordination Center of Southern Wisconsin – Greater Wisconsin Area on Aging Resources (GWAAR):** This project is developing a deployment plan for a regional TMCC,

⁵ Science Applications International Corporation (SAIC) and TranSystems, *Mobility Services for All Americans Model Deployment: Technical and Management Assistance – Final Report*, prepared for the USDOT ITS JPO, September 2013.

⁶ Eight Phase 2 project sites, https://www.its.dot.gov/research_archives/msaa/msaa_background.htm

enabling high-tech coordination among local transportation providers, demonstrating how modern, relatively inexpensive cloud- and mobile-based tools can improve interoperability.

These projects are overcoming technical and institutional barriers to promote system interoperability by establishing operational data sharing and coordination between multiple technology platforms, involving at least two human service transportation programs and providers, and demonstrating functional common fleet information platforms.

The result of these last round of planning grants will be the completion of fundable deployment plans for technological and integration systems that bring together a variety of transportation options to enhance mobility of the HST population and beyond. The continuation of support for TMCC-based transportation coordination and transition of MSAA to fit the greater vision of Mobility on Demand (MOD) is currently being made possible by aligning cross-program objectives of several FTA and ITS JPO initiatives/programs under the MOD umbrella. The MOD vision supports mobility management concepts that are similar to TMCC systems, with an overall goal of integrated mobility for all.

MSAA in Mobility Management

Mobility Managers work to ensure that all of a community's transportation assets and resources are used to their greatest potential, providing the most mobility possible in the most effective and efficient way. In many areas, particularly smaller suburban and rural settings, the human service transportation fleet represents a significant portion of the available transportation assets, regardless of whether funded by government, philanthropy, or the faith-based organizations.

Better leveraging those assets presents an opportunity to improve mobility across the board. In the case of MSAA, technology-based mobility management concepts play a great role in the collaboration of assets and resources in a way that mobility transforms from being a commodity to a service. MSAA has shown how such coordination would work, how the developed systems and processes would support that integration, and shown the value of a structured process for including stakeholders like funders, operators, customers, and system users in the design process. Such partnership development is a key competency of mobility managers. MSAA has provided tools, and a process to bring the right people around the table, with the right process to lead to a useable integration, and, more importantly, having the right objectives for a common goal built around consensus of all stakeholders.

For mobility managers, working to maximize their community's mobility by integrating and creating travel options, from bikeshare to carshare to volunteer driver programs, leveraging the human service network in the way envisioned by MSAA allows them to reach farther and do more, in more contexts.

Supporting Mobility on Demand

It is also important for the agency/region to have a mobility plan in place to support continuous and effective mobility management operations by keeping up with the technological advances, business collaboration models, and policy evolvments in the industry. Integration of and monitoring these elements are part of the MOD vision, which is one of the primary reasons for the logical progression of MSAA and TMCC types of concepts and systems into the community-based mobility management

concepts, and, ultimately, transition into the integrated mobility system as envisioned by the MOD philosophy.

MCAA supports the Mobility on Demand vision by leveraging HST resources and connecting with the customer base served by the 80-plus federal programs that are part of the CCAM. Using MCAA as a key link in the MOD vision helps provide options to different market segments and promotes equity and inclusiveness in transportation options by promoting access to people with fewer options.

MOD encourages expanded research opportunities including those that foster greater system connectivity, demand responsiveness, and automated travel. Integration of mobility services from different providers and agencies is being accomplished under the MOD Sandbox projects, where innovative business, technology, and platform collaborations are implemented as demonstration projects, and their effectiveness is measured through a series of next generation performance metrics. From the broader perspective of FTA's mobility ecosystem, the intention is to transform the rather isolated MCAA-supported projects (implemented or in deployment planning stages) into the broader ecosystem of mobility for a region, supporting an integrative service provision. Some of the initial steps in the integration phase is to understand the opportunities for integration and plan for the transformation process. Such transformation and integration planning is particularly challenging due to the localized uniqueness of each system and setting. Therefore, developing a framework for the integration of technology-based demand-response systems to the regional mobility system appears to be the next logical phase in the process.

The MOD Sandbox

Social, cultural and technological changes are dramatically remaking the mobility landscape. The prevalence of smart phones, the growing power of data processing and the explosion of Big Data have helped seed the development of mobility concepts and solutions from bike- and car-sharing systems to microtransit and re-envisioned paratransit services. These are providing travelers with flexible and convenient transportation options while impacting the funding and business models that have long sustained public transportation in this country.

Through the Mobility on Demand Sandbox program, the Federal Transit Administration (FTA) is researching how these new service options, in combination with available technologies can support greater individual mobility.

The objectives of the Sandbox are to:

- Enhance transit industry preparedness for MOD
- Assist in the integration of MOD practices with existing transit service
- Validate and document innovative MOD business models and best practices
- Measure the impacts of MOD on travelers and transportation systems
- Examine requirements, regulations and policies supporting the adoption of MOD.

Sandbox Project Example

Paratransit Mobility on Demand Demonstration

The Pinellas Suncoast Transit Authority (PSTA) has received \$500,000 in funding for their “Public-Private Partnership for Paratransit” Demonstration. This effort involves partnerships with a taxi company, a paratransit service, and a TNC to remake ADA-mandated paratransit services, hoping to provide more cost-effective, on-demand, door-to-door service. The project features central dispatch software that provides users with a selection of transportation service providers based on an estimated time of pickup, available payment types, and physical limitations. The project utilizes many of the lessons learned through MSAA, from the importance of stakeholder engagement, to how partnerships are structured, and the technology solutions designed.

Intended Outcomes

Cost

PSTA spends an average of \$22.50/ride for the more than 250,000 trips they provide yearly. The approximately \$6.2M spent represents 10% of the agency’s operating budget. In Fiscal Years 2015 and 2016, PSTA saw increases in paratransit operating expenses of nearly 9% and 5%, respectively. With an increasingly aging population fueling a growing demand for paratransit services and no new revenue sources on the horizon, PSTA will be faced with the need to divert critical funding away from fixed route services to continue to provide paratransit services as required under the Americans with Disabilities Act (ADA).

Service Quality

Currently, PSTA’s paratransit services are operated by a local company that provides both ambulatory and wheelchair trips. Eligible riders may reserve trips up to one month prior, but no later than 5:00 p.m. the day before a trip. Further limiting flexibility for customers, once dropped off, passengers must wait at least 30 minutes between drop-off and pick up times. For medical trips where the end time is unknown, customers must wait up to an hour to be picked up. This lack of flexibility and reliability are common customer complaints and hinder the usefulness of the system.

New Partnerships

The project will demonstrate an integrated, flexible, customer-focused approach to transportation for ADA paratransit-eligible riders, supported by innovative partnerships. Like a growing number of transit agencies, PSTA saw an opportunity to partner with a Transportation Network Company (TNC) to support their goals. TNC coverage in Pinellas County is among the best in Florida with an average response time of under 7 minutes. However, the team understands that the use of TNCs poses challenges, including ensuring equitable access to those who do not have smartphones, or who use wheelchairs. This project works to address this by utilizing new software and service mechanisms, including exploring innovative approaches to increasing the availability of wheelchair accessible vehicles, and providing an interface independent of smart phone use. In addition to new technology and service arrangements, this project will assist in identifying regulatory/legal barriers that might prevent widespread implementation, as well as key performance indicators that can be used throughout the industry, as they explore such innovative approaches.

Managing Mobility on Demand for All Americans: Key Concepts United

The transportation universe is moving inexorably toward a more on-demand and demand-responsive future driven by technology, demographics, and other shifting realities. This brave new world holds much promise, but also challenges. It will be important to ensure that all people can share in the benefits of this evolution...that we achieve Mobility Services for All Americans.

The MSAA program helped our industry see the potential in coordination, integration, and inclusive service planning and delivery. It laid out systems and approaches for capitalizing on the range of human service transportation assets in communities to make mobility easier for those with disadvantages and providers more efficient in providing transportation.

Coordination and inclusion are central principles in the field of mobility management and integrated mobility concepts. The Transportation Management Coordination Center (TMCC) concept, explored and developed through the MSA program, supports the mobility management goal of simplifying consumer access to their mobility choices. One-Call, One-Click centers spread around the country to meet this need.

Today, the vision has expanded. Mobility Services for All Americans means exactly, that- whether the person is older, has a disability, or not, we are creating a world in which appropriate choices are made readily available to all travelers. This vision of Mobility on Demand, founded on creative partnerships and supported by technological systems and innovation is the logical next steps in a movement toward universal mobility for all.