

Lower Savannah Aging, Disability & Transportation Resource Center: Regional Travel Management and Coordination Center (TMCC) Model and Demonstration Project

Final Report

OCTOBER 2014

FTA Report No. 0065
Federal Transit Administration

PREPARED BY
Lower Savannah
Council
of Governments
(LSCOG)



COVER PHOTO

Courtesy of Edwin Adilson Rodriguez, Federal Transit Administration

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Lower Savannah Council of Governments (LSCOG)
2748 Wagener Road
Aiken, SC 29802

SPONSORED BY

Federal Transit Administration
Office of Research, Demonstration & Innovation
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

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Metric Conversion Table

SYMBOL	WHEN YOU KNOW	MULTIPLY BY	TO FIND	SYMBOL
LENGTH				
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
VOLUME				
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liter	L
ft³	cubic feet	0.028	cubic meters	m ³
yd³	cubic yards	0.765	cubic meters	m ³
NOTE: volumes greater than 1000 L shall be shown in m ³				
MASS				
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
TEMPERATURE (exact degrees)				
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C

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TABLE OF CONTENTS

1	Executive Summary
4	Section 1: Description of Lower Savannah Council of Governments
6	Section 2: Description of the Lower Savannah Region and the Network Transportation Providers
10	Section 3: The Early Years: A Vision For and Grant Development of Coordinated Transportation
12	Section 4: Medicaid Brokerage and Its Impact on Coordination
16	Section 5: Development of Transit Services in Orangeburg and Calhoun Counties
20	Section 6: Technology Components of the TMCC Project
25	Section 7: Technology Components: Theory Meets Reality
38	Section 8: Project Evaluations
39	Section 9: Recommendations, Observations, and Lessons Learned
47	Section 10: Grand Opening Event and Information-Sharing
50	Section 11: Conclusion

LIST OF FIGURES

6	Figure 2-1:	Map of Lower Savannah Region of South Carolina
19	Figure 5-1:	Atrium of Cross County Connection transit facility in Orangeburg, SC
47	Figure 10-1:	Ribbon cutting ceremony, August 2010
48	Figure 10-2:	ADTRC grand opening luncheon
49	Figure 10-3:	ADTRC marketing sign

LIST OF TABLES

7	Table 2-1:	2010 Census Data, Six Counties of Lower Savannah Region
51	Table 11-1:	ADTRC Call Volume

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 - Allendale County Office on Aging
 - Bamberg County Office on Aging
 - Generations Unlimited (Barnwell)
 - Santee Wateree RTA (Orangeburg and Calhoun)
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ABSTRACT

This report details the deployed technology and the implementation experiences of the Lower Savannah Aging, Disability & Transportation Resource Center in Aiken, South Carolina, which served as the regional Travel Management and Coordination Center (TMCC), created with assistance from a Mobility Services for All Americans (MSAA) grant award. The Lower Savannah Council of Governments (LSCOG) leveraged the MSAA award with grants from several other sources to procure and deploy a number of technologies to learn if they could enhance human services transportation and its coordination among the five transportation providers that served as partners in the regional TMCC demonstration project.

EXECUTIVE SUMMARY

The Lower Savannah Council of Governments (LSCOG) is one of 10 regional planning and development Councils of Government agencies established within the State of South Carolina. LSCOG represents six counties located in the southwestern part of the state. It applied for a Mobility Services for All Americans (MSAA) grant opportunity on behalf of the human service transportation providers serving these six counties and the area's residents in need of increased access to transit in this mostly rural region.

LSCOG was competitively successful in becoming one of the eight national finalists for an MSAA Phase I planning grant in 2007 and was one of three finalists awarded MSAA Phase II implementation funding in 2009. LSCOG was expected to create a Travel Management and Coordination Center (TMCC) model that would procure and deploy Intelligent Transportation Systems (ITS) to demonstrate the impact technology potentially could have on the coordination of human service transportation.

LSCOG was awarded \$680,000 in MSAA federal funding to support the TMCC demonstration project and was able to leverage several grants acquired during this same time period to address the large scope of work being undertaken in the region. A new American Recovery and Reinvestment (ARRA) grant helped build a small wing onto the existing LSCOG building in Aiken to house the newly-enhanced Aging, Disability & Transportation Resource Center (ADTRC), the local name of the regional TMCC. The wing also houses the mobility managers assisting with the transportation needs of the general public from all six counties. The South Carolina Department of Transportation (SCDOT) awarded LSCOG funding for technology and mobility management under the competitively-selected New Freedom and Job Access Reverse Commute grants. Finally, the South Carolina Lt. Governor's Office on Aging named LSCOG as a sub-recipient of a Systems Transformation grant awarded from the Centers for Medicare & Medicaid Services (CMS) during the project timeline. In total, LSCOG was able to provide the local transportation providers who partnered in the project with an array of technology, software, installation, and training sessions to support the TMCC project at no cost.

With the help of outside consultants, a technical advisory committee, FTA project managers, federal evaluators, vendors, and a systems engineering approach to implementation, LSCOG secured and deployed many different technologies as part of the MSAA demonstration project. The single most expensive technology component of the project was the purchase and installation of 100 individual Mentor Engineering Rangers, mobile data terminals (MDT) that provide, among other things, automatic vehicle location (AVL) and the ability for dispatchers to instantly update driver manifests and driver communications. The MDT/AVL units also aid in the verification process, as they can be linked with RouteMatch demand response software used for scheduling, billing, and reporting.

LSCOG owned only 5 vehicles that were being used in a small fixed-route system that served only one county in the region; the other 95 Rangers were given to the independent, autonomous human service providers who agreed to be partners with LSCOG in the demonstration project. All partners agreed that the MDT/AVL units soon became indispensable to their daily operations and increased their ability to be flexible, efficient, and more timely.

Other successful ITS deployed during the demonstration included a new phone and auto attendant call center equipment for the ADTRC in Aiken; enhanced software components created by RouteMatch Software, Inc., to aid in the coordinated scheduling of transportation among the various transportation partners; the purchase of new software that could track in real time the fixed-route vehicles being used in two different counties (vs. only demand-response vehicles); and the acquisition of new RouteMatch software and databases for two partners that did not have that technology already in place.

A new website was created for the ADTRC, and web portals were installed for use by the general public and transportation providers who wanted to join in coordinated transportation in the future but lacked the comprehensive RouteMatch software package. A data warehouse and an outbound notification system also were experimented with during the project, but were later found to be of limited benefit and/or prone to problems, and will not be renewed or further developed until a three-year sustainability period has passed.

The independent evaluators hired by FTA to study all three of the MSAA Phase II demonstration projects struggled with their acquisition of hard data from the LSCOG region that could prove, or disprove, the hypotheses that new technology would enhance coordination efforts, increase the number of passenger trips provided, bring greater efficiency to the use of existing vehicle fleets, and improve the passenger customer experience. Several issues affected data acquisition and its comparison with a baseline. First, little baseline data were found to be indisputably accurate, since they had been acquired using older methods of collection and reporting by the various partner agencies. Newer, more accurate numbers acquired after the project started were helpful, but evaluators were no longer convinced that the operating environment was “apples to apples” due to tremendous changes that happened over the period of the grant; therefore, they were careful not to draw straight-line conclusions.

The single most significant issue between Phase I planning and Phase II implementation was the decision by the State of South Carolina to change its Medicaid transportation to a for-profit broker instead of continuing to use the long-established single transit provider in each county, which often was a human service agency or a regional transportation authority. These single county transit providers were the original LSCOG MSAA partners in the project, and their operations and client base changed drastically over the first three years under

the brokerage system. This also resulted in a “pull back” from the network transportation providers’ earlier interest in consolidating and centralizing certain operational duties as it was originally considered during the planning stages of the new TMCC model.

This report details the originally-expected (vs. actual) benefits of each technology component pursued by the TMCC project. It details the rise of a new transportation system in Orangeburg County and the financial fall experienced by some of the project partners when they no longer controlled their own Medicaid contracts. Also detailed is the negative impact this change in Medicaid transportation had on budding transportation coordination efforts that were underway in the region. The report provides a list of 20 recommendations, observations, and lessons learned from experiences gained with technology acquisition and deployment, grant management, and the coordinated transportation efforts among the participating agencies.

Description of Lower Savannah Council of Governments

The Lower Savannah Council of Governments (LSCOG) is a regional planning and development agency serving the local governments of a six-county region in South Carolina. LSCOG is one of 10 regional Councils of Government serving the counties of South Carolina and houses several programs under its authority:

- Community and Economic Development Planning and Administration
- Regional Workforce Development Board (WIA)
- Regional Tourism Department
- Human Services Department
 - Regional Area Agency on Aging
 - Older Americans Act funding for contracting and purchase of programs such as home-delivered meals and in-home supports
 - Aging, Disability & Transportation Resource Center (ADTRC)
 - Information, Referral and Assistance specialists
 - Medicare counseling and a “SHIP” Program
 - Medicaid Managed Care Plan counseling and selection
 - Family Caregiver Support Program
 - Regional Long-Term Care Ombudsman

Housing these programs, combined with the roles of acquiring State and federal grants and leading the progression of human service transportation coordination, has placed LSCOG in a good position to lead stakeholder involvement in the implementation of a Travel Management and Coordination Center (TMCC) and act as its champion.

It is important to note that LSCOG is not a direct provider or operator of transportation. Rather, LSCOG facilitates transportation services in the region by being a grantee of transportation funding streams and contracting outside the agency for providers of transportation services.

During the planning and implementation stages of the TMCC project, LSCOG was responsible at one time or another for writing, submitting, competing (when necessary), and being awarded the following grants, which were leveraged in whole or in part, to complete the TMCC’s efforts for a one-call center and

the purchase of 100 units of mobile data terminal (MDT) and automatic vehicle location (AVL) and supporting technologies shared with the participating transportation service providers:

- CMS Systems Transformation Grant (national competition)
- MSAA I Planning Grant (national competition)
- MSAA II Implementation Grant (competition among previous MSAA planning grantees)
- United We Ride Grant (national competition)
- Section 5304 Planning Grant (SCDOT award)
- Section 5316 Rural Grant (SCDOT competitive selection)
- Section 5317 Rural Grant (SCDOT competitive selection)
- Section 5316 Urban Grant (FTA Region IV regional competitive selection)
- Section 5317 Urban Grant (FTA Region IV regional competitive selection)
- Section 5307 Urban Grant (Direct Recipient Public Transportation for Aiken County)
- Section 5303 Urban Planning Grant (MPO award)

SECTION
2

Description of Lower Savannah Region and Network Transportation Providers

The Lower Savannah Region is made up of six counties on the southwestern side of South Carolina. The LSCOG name originated from its proximity to the Savannah River, which serves as the border of between South Carolina and Georgia and is less than 20 miles from the LSCOG offices. A map of the Lower Savannah Region is shown in Figure 2-1.



Figure 2-1
Map of Lower Savannah Region of South Carolina

The six counties served by LSCOG include Aiken, Allendale, Bamberg, Barnwell, Calhoun, and Orangeburg. The LSCOG office building houses the TMCC and is located in Aiken County. Because of its proximity to the Georgia state border and the Georgia city of Augusta, a part of Aiken County is considered by the Federal Transit Administration (FTA) to be a “large urban” transit area. These are defined by a census population of more than 200,000; Augusta makes up the bulk of that census threshold in population. However, since the urbanized portion of Aiken County is included in this designation, LSCOG is a Direct Recipient of Section 5307 funds for large urban areas. The rest of Aiken County and all the other five counties are quite rural.

Aiken County is the largest and most affluent county in the region, and Allendale County is the second poorest county in the entire state. Table 2-1 shows the population and per capita income of each of the six counties in the region. The median household income for Aiken County is \$44,399 and for Allendale County is \$25,966.

Table 2-1
*Census Data, Six
Counties of Lower
Savannah Region**

County	Population	Per Capita Income**
Aiken	160,099	\$ 24,677
Allendale	10,419	\$ 14,361
Bamberg	15,987	\$ 18,680
Barnwell	22,621	\$ 18,109
Calhoun	15,175	\$ 22,483
Orangeburg	92,501	\$ 18,289
Total	316,802	\$ 19,433

*Regional land area = 3,981 sq. mi.

**Per capita income is less than median household income for each county listed.

The Lower Savannah Region is large, covering 3,981 square miles. Much of the region has higher-than-average levels of ill health, poverty, disability, and single-parent households. Some counties lack adequate medical care, so residents must travel out of the county, and often out of the region, to access it. Rural health centers have reported that one-third of all medical appointments are missed due to their patients’ struggles with transportation.

The rural nature of the region creates many barriers to effective transportation services. The sheer geographic area of the counties, the number of unpaved roads, the high unemployment rate, and a low taxpayer revenue base to fund transit programs all contribute to the difficulty of moving around the region. Census data reveal that approximately 25 percent of families in the region do not have a vehicle available to them.

LSCOG submitted proposals and was the MSAA grantee and lead agency of the demonstration project. LSCOG was interested in competing for MSAA

funding that would also be of benefit to outside agencies pursuing human service transportation in the Lower Savannah Region and who desired improved coordination within the region and increased efficiencies within their operations. While the initial stakeholder group during the MSAA planning grant was large and varied in order to bring together broad representation for the mandatory needs assessment, the MSAA implementation grant narrowed the primary stakeholders to five human service transportation providers that make up the partner “network” and serve, in some way, the transportation needs of all six counties. These partners received free equipment, installation, training, software licenses, and other benefits secured through LSCOG management of the various grants leveraged to support the demonstration project.

The partner agencies include the following:

- **Aiken Area Council on Aging (AACOA)** is a human-service not-for-profit agency serving Aiken County through aging and various transportation programs. AACOA coordinates its transportation, with the assistance of mobility managers at LSCOG, for the contracted services of Section 5310, Americans with Disabilities Act (ADA) paratransit, and Section 5307 large urban fixed routes. AACOA also holds private contracts with LogistiCare for its Medicaid-brokered Non-Emergency Medical Transportation (NEMT) transportation.
- **Allendale County Office on Aging (ACCOA)** is a human service agency assigned by the Allendale County to serve older adults with aging programs. It is also a contracted provider with LogistiCare for its Medicaid-brokered NEMT transportation serving the local area. It is the primary provider, by contract, of service in Allendale County for Section 5310 and Section 5311 transportation service offered to the public in the form of demand-response transportation. Public transportation is offered under its small Allendale Scooter transit system, and mobility managers at LSCOG take the calls for the Allendale Scooter service.
- **Bamberg County Office on Aging (BCOOA)** is a human service agency assigned by the Bamberg County to serve older adults with aging programs. It is also a provider with a private contract with LogistiCare for Medicaid transportation performed in the local area. BCOOA performs coordinated transportation with a shared-ride model called the Handy Ride and uses Section 5311 public transportation and Section 5310 transportation funding for older adults and persons with disabilities to support the Handy Ride.
- **Generations Unlimited (GU)** is the Barnwell County Council on Aging office. It is the provider of aging services for the county and secures Section 5311 public transportation funding for its transit system, Local Motion. LSCOG also contracts with GU to provide Section 5310 coordinated human service transportation.

- **Santee Wateree RTA (SWRTA)** is a regional transportation authority from a neighboring region that agreed to contract with LSCOG and Orangeburg County for Section 5311- and Section 5310-funded transportation provided in a coordinated fashion with area council on aging and disability groups. SWRTA also had private contracts with LogistiCare for Medicaid transportation, which assisted with a coordinated shared ride model. However, SWRTA has undergone significant changes within the last two years and is no longer providing Medicaid NEMT transportation and soon will no longer provide demand-response transportation service. It will continue contracted service for the Section 5311 grantees in the area, providing fixed-route transportation only. This has precipitated changes with the transit system (Cross County Connection) and the role of coordinated transportation in Orangeburg and Calhoun counties. LSCOG mobility managers are very active in the transit system and take calls for trips in that geographic area.

The Early Years: A Vision for and Grant Development of Coordinated Transportation

LSCOG set out on a path to develop both transit capacity and coordination among transportation resources in the six counties of the region it serves—Aiken, Allendale, Bamberg, Barnwell, Calhoun and Orangeburg—in southwestern South Carolina. Based on a 1999 coordination study funded by SCDOT, LSCOG brought together an informally-bound group of stakeholders to become an advisory group, the Regional Transportation Management Association (RTMA), and a more formally-established group to make policy recommendations, the Policy Committee. Each county in the region signed a Memorandum of Agreement to participate in the RTMA and made the commitment to provide one elected county government official to sit on the Policy Committee. Only two counties in the region had any type of public transit at the time, so the stakeholders were primarily human services agencies and a few for-profit or advocacy organizations. In 2000, LSCOG was made the designated transportation coordination entity for the region by SCDOT, and a more formal effort to enhance human service transportation began.

At that time, some local human service agencies in the region were enjoying economic success from assuming the role of the single NEMT² contracted provider position for their respective counties and were positioning themselves to be prime candidates to operate shared-seat demand-response transportation for other funding sources in order to serve more people in their counties. LSCOG staff worked over the next 10 years to help develop coordinated public transportation services in the four counties that did not have any public service, one county at a time. It was a slow and painstaking process, involving local government, local community leaders, and local service agencies who were willing to work together under the auspices of the RTMA. SCDOT was also involved during the planning and development processes, and in each county local government agreed to invest in supporting the new systems.

While this work was underway, LSCOG staff also was working on building the internal infrastructure to lead coordination among resources in the region. In 2003, LSCOG became designated and was funded as the first Aging and Disability

Resource Center (ADRC) in the state and one of the first 10 in the United States. This brought about further collaborative planning and development among state, regional, and local partners in the process. It gave LSCOG the necessary infrastructure to become a one-call center for human services and long-term-related care services and benefits. Experience with the established goals of the RTMA and the ADRC validated the desire of LSCOG to focus on transportation as a missing link in providing access to local citizens to independence and health. In a 2003 strategic planning session, the RTMA transit operating agencies developed a written vision for a one-call center, enhanced by transportation technology and increasing citizen access to needed transportation. A formal vision was defined, a goal was set, and the effort to obtain funding began.

In 2004, at the instigation of LSCOG, the State unit on aging applied for and won one of a limited number of Centers for Medicare and Medicaid Services (CMS) Systems Transformation grants available nationally. Beginning in 2005, large parts of this CMS grant were appropriated to LSCOG to provide planning and implementation funding to add and integrate transportation to the information and assistance offerings of the ADRC. It also provided available matching funds for further grants seeking to carry out this planned expansion. LSCOG realized that to implement coordination among regional transit-providing partners successfully, new technology was critically needed. The prospect of acquiring enough financial resources to provide the 100 or so vehicles belonging to the stakeholders in the region involved in the coordination network of the RTMA was challenging. LSCOG's area is predominately rural and parts of it are very poor. LSCOG successfully competed for MSAA Phase I planning funds and was among a group of eight nationally-selected agencies that participated in the design of a TMCC from 2007 to 2009.

The hypothesis that drove this work centered on the potential for combining technology with teamwork among regional transit operators who had the will, but not necessarily the means and equipment, to work together to hold costs down and serve the most people possible. Making some technological improvements in the ADRC—which would soon become an Aging, Disability and Transportation Resource Center (ADTRC)—and providing new technology were central to the design of the project.

Only the original eight grantees awarded Phase I grants were allowed to compete for the MSAA Phase II grants to implement their TMCC designs. LSCOG successfully competed for Phase II funds and was one of three sites chosen nationally to proceed with implementation, which began in 2010. Phase II funds were awarded at \$680,000 and were combined with CMS System Transformation grant funds and locally-awarded competitive grants available from SCDOT to support the original vision of the RTMA and the design of the TMCC.

Medicaid Brokerage and Its Impact on Coordination

A change in the way Medicaid's NEMT is now carried out had, and continues to have, a significant impact on both the progress and the outcomes of the MSAA/TMCC project. It has negatively affected most of the rural public transit providers in South Carolina, and its effects continue to spill over into the health and well-being of the populations it serves.

Medicaid Transportation Delivery Model Before

As the LSCOG MSAA Phase I planning grant was being awarded, the South Carolina Department of Health and Human Services (DHHS) implemented a change. Instead of keeping a single procured provider of non-emergency, non-ambulance Medicaid transportation services for each county in the state, the Medicaid transportation service was switched to a brokerage system. This change from a county system to a broker model significantly impacted coordination and the TMCC project. Shortly after the original Phase I proposal development carried out by LSCOG for the MSAA grant, in four of the six LSCOG counties, human service agencies were the provider of FTA-funded rural public transit services and the sole provider of Medicaid's NEMT services. These human service agencies also carried out other contracted transportation services. The transportation services were demand-response and served all parts of the counties in which they operated and were operated on a shared-seat basis. In the remaining two counties of the Lower Savannah Region, a Regional Transportation Authority from a neighboring region was the exclusive Medicaid transportation provider for those two counties and had a local office, a fleet of vehicles, a dispatch center, etc., and operated coordinated transportation in the same manner.

These providers were the basis for the network of coordinating transportation providers serving the Lower Savannah Region. Through years of coordination development work led by LSCOG, these agencies became that network and shared an interest in using technology to further the steps they were already taking to bring about shared-seat, coordinated transportation. Standing orders for such services as dialysis, cancer treatments, therapy, mental health day programs, etc., became predictable travel patterns serving both the towns and the rural areas of each county. It was possible for these transportation providers to work into available seats other passengers traveling to employment, non-Medicaid medical appointments, or other destinations as they traveled about the counties. Initial DHHS permission for these transportation providers to share

a Medicaid-funded and assigned trip had progressed to an agreement on the mileage rate to be shared among the network and a computer software solution at DHHS to accommodate providers between counties inputting trip data on the same shared trip.

Medicaid Transportation Delivery Model After

When the brokerage system was implemented, a new mileage rate was negotiated with the many individual transportation providers, including the established transportation providers making up the coordination network in the Lower Savannah Region. No longer would there be just one provider of transportation service per county. A point-to-point method of counting eligible mileage was implemented rather than a passenger-per-mile method. Deadhead miles would not be reimbursed, and wait times had to be carefully considered and approved ahead of time. The broker treated each trip assignment as an individual transportation event that took only Medicaid passengers into account, and the broker began assigning a pickup time for the transportation provider in addition to the medical appointment time. This was done without regard for any other passengers who may also be riding in the vehicle, any previously-established travel patterns, and often without any local literacy regarding true travel time necessary for rural distances. The contract performance measures for the Medicaid passengers had to be followed. Losing control of these aspects of transportation delivery made it very difficult for a provider under a Medicaid contract to coordinate with other funding sources and contracts. Permission was denied by the broker to share a particular assigned Medicaid trip among different providers if they wanted to coordinate a trip between the counties.

After the Medicaid brokerage began, the broker worked to bring in numerous outside transit providers, including small “mom and pop” operators and volunteers who were reimbursed at a very low rate for mileage. The predictability of trips for previously-established transportation agencies eroded, and most of the longer, out-of-town trips to major medical centers began to be assigned to the less-expensive providers. Mileage volume was diluted among the increased number of contracted providers to the point that sustainability over the long term began to be jeopardized, and many of the providers, both private and public, began to see their funding reserves disappear and their revenues shrink drastically.

Additional Outcomes from the New Medicaid Brokerage Model

These changes soon affected the provider network’s ability to accept shared-ride trip requests from the traveling public they had previously accommodated.

Established transportation providers that had performed Medicaid transportation for their counties for years began to lose trip assignments. Most important, the real “bread and butter” of a transportation agency—the “standing order”—was no longer ensured for a provider; the broker would agree to assign only one trip, one day at a time. A provider may get assigned Mr. Smith to transport on Monday, but the broker could not guarantee that same provider would be assigned Mr. Smith’s trip on Wednesday and Friday of that same week. A transportation agency’s ability to predict its schedule and accept coordinated trips from other passengers in advance was lost.

Because of this, many public transit providers across the state have found themselves on the verge of financial ruin. One formerly large and viable provider of transportation services covering two counties in the Lower Savannah Region, and an important MSA project stakeholder, has stopped performing all demand-response service, including dropping its contract for Medicaid NEMT; it simply was losing too much money. Now, the traveling public in the rural outlying areas have greatly-reduced options for mobility in those two counties.

That impact is felt in each of the six counties that make up the Lower Savannah Region. Even when a provider still is providing Medicaid NEMT transportation and accepting shared-ride coordinated transportation, the number of trip requests from the general public for demand-response service has increased, but the ability of the provider to accept and provide the trip has declined. The older travel patterns had been built on the pickup and destination locations of Medicaid clients; now, network transportation providers simply were not getting enough of those trips under the new model to be traveling to the same destinations to which the public once was able to ride along, especially if the trip request was for a ride to medical facilities well outside the region (Columbia, Charleston, Greenville). The broker appears to be successful in finding alternative “mom and pop” providers for longer distances.

Advances in the ability to use technology to enhance coordination of transit services across funding sources came at the same time as the State agency spending the greatest amount of money to provide transportation to SC citizens was taking giant steps backward in coordinating its services. LSCOG and its network of providers have assisted others around the state with educating elected officials and decisionmakers about the net negative effects of the current brokerage system on the overall availability of transportation to the transit-dependent public. SCDOT has expressed grave concern about the ability of current Medicaid NEMT transportation providers to sustain operations once existing vehicles need to be replaced. Discussions are now taking place through the SC Transportation Coordinating Council, hosted by SCDOT, about possible alternative models for operating a more coordinated system of publicly-funded transportation. The state’s public transportation association, the SC Alliance for Mobile Infrastructure, has taken this on as a major initiative for fiscal year 2015

and is working in tandem with SCDOT to educate decisionmakers on the need for a better model of service delivery for Medicaid NEMT and other publicly-funded transit services. LSCOG and its provider network are engaged in this activity and are hopeful that there will be increasing opportunity for coupling tested technology with greater opportunity for transit coordination across funding sources in the future.

Development of Transit Services in Orangeburg and Calhoun Counties

During the time that LSCOG was working on completing the design for the ADTRC and preparing its competitive proposal for the implementation phase of the MSAA project, staff were working with an enthusiastic and large group of stakeholders in Orangeburg and Calhoun counties to address the need for a public transit system to serve these last two counties in the region that were without public transit service. Orangeburg is a large county, and Calhoun is a small one; the two often collaborate on infrastructure such as the local medical center and the technical college, which are shared between the counties.

The stakeholder group included 90 people—elected officials and representatives from medical providers, social service agencies, employment programs, the higher educational institutions in the area, and citizens. The group met as part of a planning and implementation process over a three-year period, with meetings facilitated by the LSCOG Assistant Executive Director and assistance from the agency’s Human Services Division Director and other LSCOG staff. Participants in the group were passionate about the need for transportation services but also were cognizant that two previous attempts to start and maintain a public transit system by other stakeholder groups had failed in the past.

SCDOT staff were involved along the way and, after a careful planning process, which included a feasibility study, SCDOT agreed to fund the new public transit service in a demonstration project status for a period of three years. LSCOG served as the grantee and administrator of the Section 5311 rural public transit funding for the system. The Santee Wateree Regional Transit Authority (SWRTA), located in a neighboring region, was the Medicaid NEMT transportation provider for the two counties and was the logical provider to take on public transit in the area by allowing extra demand-response passengers to share available seats on its vehicle fleet, operating throughout both counties. It enjoyed a good reputation and a track record for quality service and had a local transit office with a fleet of vehicles and supervisory, scheduling, and dispatching staff, as well as a nearby home office to provide quality control, IT services, financial operations, drug testing, maintenance and regulatory compliance oversight.

Launch of the New Public Transportation System and Pilot Services

The Cross County Connection public transportation system was launched in 2009 with call-ahead demand-response service serving both Orangeburg and Calhoun counties. Several months later, two fixed routes were developed to service downtown Orangeburg. Soon after that, a fixed route began serving the county seat of Calhoun County with express service into Orangeburg.

The next phase was a test run for a route connecting towns in eastern Orangeburg County to existing downtown routes. However, ridership on that route did not correspond with the public interest in the route, and service was discontinued during the demonstration period.

A goal of the Cross County Connection was to contract with and provide on-campus service at South Carolina State University (SCSU), located near downtown Orangeburg, to help ensure the system's sustainability. Claflin University, a neighboring private, religiously-affiliated university also expressed interest in being served by the system. In 2011, an SCSU campus route, the Campus Loop, was successfully implemented for the fall semester, as were express services to the most popular shopping and entertainment destinations. It was anticipated that demonstrating the popularity of the route with students would be the final encouragement needed to persuade campus leaders to institute a student transit fee across the board to invest in the system. Although a series of unanticipated financial setbacks for SCSU has prevented it from investing in the transit system, the popular Campus Loop route still operates.

In Calhoun County, a daily route in the county seat of St. Matthews stopped at the County Complex campus and made a run into Orangeburg and back several times each day. The routes were timed to meet the needs of students at the Orangeburg–Calhoun Technical College, who traveled between the main campus in Orangeburg and the satellite campus in St. Matthews. However, heavy student ridership did not materialize, as had been anticipated during the planning phase, and the advisory committee decided to operate the Calhoun route just one day each week as a result.

The Changing Landscape and the Role of the Mobility Manager

It became evident that the volume of demand-response transit service that had been serving local citizens throughout the large land area of Orangeburg and Calhoun counties and 17 municipalities was going to have to be cut back to sustain the popular and more visible fixed routes of the Cross County Connection system. In the second year of the project, demand-response volume was curtailed, this time because SWRTA began making fewer and fewer Medicaid trips within the county due to the effects of the implementation of the new Medicaid brokerage system by the State. Trip requests were being denied on occasion because not enough passengers could be grouped together to ride to common destinations. The cost of performing demand-response service as part of a human service coordination plan originally had been spread over several funding sources but now was increasing as the overall volume of Medicaid trips assigned to SWRTA declined and could no longer be cost-allocated to that funding source.

Incoming calls to the ADTRC for transit assistance increased between 2010 and 2013. Mobility management staff remained busy with calls from the Orangeburg and Calhoun areas, even with a decline in reservations for demand-response service. Inquiries about the service increased as routes were added and more people began to use the system. Fortunately, the TMCC project was providing new technologies that could handle the call volume at the ADTRC. Mobility management staff also tracked unmet needs, declined demand-response trip requests, and continued to take calls from passengers involved in other public transportation programs in other counties,

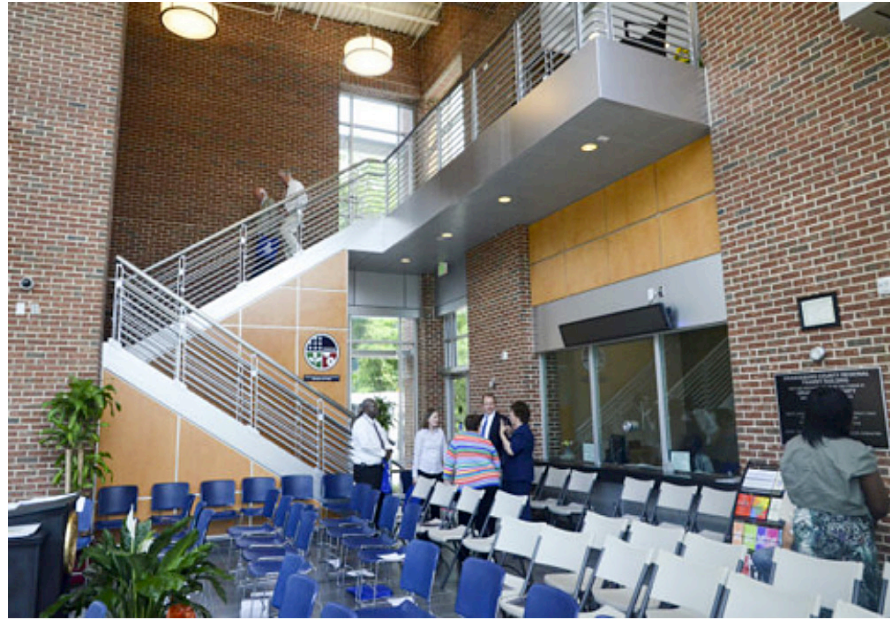
New ARRA Funding for the Cross County Connection Facility

An opportunity arose to apply for ARRA funds to construct a much-needed transit transfer facility in downtown Orangeburg to serve the Cross County Connection transit system. LSCOG was the successful applicant for funding for a new \$3 million building that would provide safe and comfortable shelter for passengers and housing for transit system staff and buses and would upgrade the appearance of the street on which it would be located.

The building's grand opening was in the summer of 2013, and in July 2013, LSCOG transferred both the building and the 5311 public transportation grant to Orangeburg County. At the request of the local government, LSCOG continues to assist with system administration as a technical consultant.

Figure 5-1

*Atrium of Cross
County Connection
transit facility in
Orangeburg, SC*



Technology Components of the TMCC Project

An objective of the TMCC project was to determine if technologies could increase coordination among agencies that transport clients and, as a result, provide more passenger trips in the Lower Savannah region as a whole, particularly if this could be accomplished without investing in larger vehicle fleets. Intelligent Transportation Systems (ITS) were to be deployed in both the one-call/one-click center and among the transportation providers that were the stakeholders in the MSAA Phase I planning grant and the Phase II implementation grant.

The most expensive technology procured for the transportation partners by LSCOG were on the MDT/AVL units and software, which would provide several advantages for the transportation providers. A discussion of the anticipated benefits of such technology investments follows.

Expected Benefits

MDT/AVL Technology

MDT/AVL equipment was expected to provide agency dispatchers with the ability to view, in real time, the location of their entire fleet throughout the day, providing them with more choices on which vehicle and driver to assign for the will-call pickups that form much of the transportation activity throughout the day. Pickups for return trips home are particularly susceptible to inefficiencies because response to a call must be within a certain time period for contract performance measures; drivers must be close enough to the pickup location and available to respond without interrupting the travel plans of any passengers already on the vehicle. Occasionally, the trip will be solo because of the difficulty in scheduling return trips for an unknown pickup time. Prior to MDT/AVL technology installation, dispatchers would radio drivers to inquire about their current location to determine who could pick up a returning passenger. Many dispatchers suspected that driver responses were not always accurate, which presented an ongoing challenge for real-time scheduling.

It was anticipated that MDT/AVL technology, through inter-agency coordination and cooperation among regional transportation providers, would allow providers to view other agency transportation assets in real-time. This could aid in requests for assistance if another provider was in the vicinity of the will-call client and could provide pickup service on the original provider's behalf. For example, if Allendale Scooter had a vehicle parked at a dialysis center in Orangeburg and was waiting for three hours to return its passenger home to Allendale after

treatment, SWRTA could request that the parked Allendale Scooter driver pick up a SWRTA client close by and provide the return-trip transportation, which would be more cost-efficient than finding one of its own drivers/vehicles that could respond to the SWRTA will-call request.

Another benefit would be that drivers interacting with the MDT and pressing the “arrive” and “depart” buttons at various scheduled stops along the way would make the verification process much more efficient, save staff time, and possibly reduce human error when reconciling the driver’s manifest with actual trip performance data at the end of the day. Verification is a crucial step in the development of billing and is a separate module in the RouteMatch TS scheduling, dispatching, and billing software currently used by the transportation partners.

MDT/AVL equipment also would provide a way to communicate with the driver without using a radio. While various “canned” messages are available for dispatchers to send to a driver, the most important communications between drivers and dispatchers are for add-on trip requests—will-call return trip requests and cancellation requests. By using the MDT/AVL unit to manage trips electronically, the manifest could be updated accurately, and the verification process could be updated at the same time.

MDT/AVL equipment on fleet vehicles also would provide an effective method to resolve the scenarios that occur in demand-response transportation when a driver claims to have made a stop and waited on a passenger, but the passenger claims the driver never showed up for the scheduled pick-up. The AVL captures the exact time, date, and location of the vehicle and can be played back on the dispatcher’s computer screen later to resolve disputes.

Coordination Module Technology

All the transportation providers used RouteMatch software for their scheduling, dispatching, verification, and reporting tasks prior to the onset of the TMCC project. An important part of this project was to provide an upgrade from the original 3.0 version of the RouteMatch software to the 5.1 version, which had more robust features and included a new coordination module. This new module would be the tool used by both the one-call/one-click center and the transportation providers to communicate the need and availability of seats on vehicles operating around the Lower Savannah Region.

This would take place at two levels of coordination. The first would involve the LSCOG/ADTRC mobility managers taking travel requests from the public either by phone or through the website and uploading the trip request to providers for acceptance or rejection of the trip request. The passenger’s original trip request would be entered and forwarded electronically through the coordination module to the network provider believed to be best suited for the trip, or it would be placed “on the board” and offered to more than one (or all) transportation

providers in the network. The providers receiving the trip request would review the trip request and make their own decision on acceptance or rejection.

Coordination also could occur between individual transportation providers using the coordination module without involving LSCOG/ADTRC. For example, if Agency A had a trip with which it needed assistance, the coordination module could be used to send the trip request to Agency B (or additional transportation providers if desired) to learn if it (they) could fulfill the trip on behalf of Agency A. This module feature was designed for situations when Agency A “owns” the passenger/client and wants to retain responsibility for his/her transportation but cannot provide this particular trip or a leg of the scheduled trip and is willing to offer the trip to other transportation partners to perhaps save money, cover for scarce transportation assets, or meet a trip performance measure that was in jeopardy. This use of the coordination module could be helpful to providers who have private contracts or passengers/clients that do not contact the one-call center at LSCOG and could be serviced by two transportation agencies interested in coordinating with each other.

The coordination module also included several features to help facilitate coordination scenarios. Once the transportation partners agreed on rates, RouteMatch would load the module with billing rules to aid in the generation of reports and invoices for reimbursement. Billing rules would take into account different funding streams and could be tied to these funding sources for different rates (i.e., Medicaid, 5310, 5311 public transportation). After a trip was performed, the verification module in the RouteMatch TS database would send the transit performance trip data back to the original transportation provider through the coordination module. This would be accomplished with the help of the MDT/AVL units equipped on the vehicle fleets.

The coordination module was planned to track trip requests, acceptances, rejections, performance data, reporting, and billing to aid with trip coordination throughout the region and among the transportation providers involved in the implementation phase.

Data Warehousing

A part of the TMCC project was to meet the needs of stakeholders—transportation providers and their transit funders such as SCDOT—for accurate trip data for reporting purposes. American Medical Response (AMR) was to develop and deploy this data warehouse, which would interface with RouteMatch Software databases owned by each of the transportation providers and the LSCOG one-call center. The interface would pull appropriate transit data out of each involved agency’s database and deposit it into a single repository.

LogistiCare Medicaid Broker Import

A small amount of funding was set aside for the development of an import between RouteMatch Software and LogistiCare, the Medicaid (NEMT) broker. All participating transportation providers involved with the TMCC project had contracts with SC DHHS for non-emergency Medicaid transportation. The Medicaid broker, LogistiCare, would send trip requests to the transportation providers electronically or by fax. The development of an import that would allow LogistiCare to electronically send daily trip requests to transportation providers and have them download directly into the RouteMatch software database would save schedulers hours of data entry each day.

The importance of facilitating NEMT trips in the most effective manner possible could not be overlooked since shared-ride seats for other forms of transportation needs depend heavily on travel patterns agencies established while fulfilling their private LogistiCare contracts. In other words, what was good for NEMT transportation was good for the goal of coordination for all project participants.

Computer-Aided Dispatch for Fixed Routes

Two out of the six counties involved in this transportation project are large enough to provide small fixed-route bus service being performed by the same providers of demand-response service. In an effort to maximize coordination, a computer-aided fixed-route dispatch software module was purchased to add the fixed-route vehicles into the technology enhancements taking place. One of the expected benefits of this investment was to bring visibility to the real-time location of fixed-route buses for passengers who wanted to transfer between a rural demand-response vehicle and the fixed routes that service more densely-populated areas. A Mentor Ranger was planned to be installed on the fixed-route buses to assist drivers with tracking the boarding and disembarking of passengers and provide a report generated by the software. It would also become an important way to measure on-time performance of buses and provide information to mobility managers for the public such as where the bus is located.

IVR and Outbound Notifications

Interactive Voice Response (IVR) would help the TMCC respond to a large volume of calls and properly route the calls among the various staff and programs offered by the TMCC/ADRTC, such as transportation and aging programs. The Phase I planning deliverable, Concept of Operations, was developed with traditional PBX phone technology in mind. If the center became a truly centralized call center handling all transportation-related calls in the six-county region, the IVR component would be helpful in routing calls to the appropriate partner agency when warranted. Also, it was anticipated that the transportation provider network in the region would become interested in extending its service

hours, and IVR could help route partner agency after-hours call volume to a centrally-located after-hours dispatcher covering for multiple agencies, saving money for the partner agencies who would not have to maintain after-hours staff in their offices.

An outbound notification module would be purchased and added to the existing RouteMatch scheduling and dispatch TS database(s). This new module would interact with the MDT/AVL units installed on the vehicles and in the TS software database and the phone system. The expected benefits included the ability for passengers to receive an incoming phone call when the assigned and scheduled transit vehicle was close to picking them up. A common complaint from consumers of demand-response transportation service is the large window of time (at least one hour) during which they needed to be ready and watching for the driver to arrive. A common complaint of drivers was that passengers were not ready when the driver arrived.

The outbound notification module also could serve as a way to reach out to many different passengers at a time for group messages such as recorded phone announcements regarding the cancellation of transportation service due to inclement weather. The outbound notification system also could call passengers the night before with a trip reminder and offer the opportunity to confirm or cancel the scheduled trip. This would work to lower the high “no-show” trip volume that costs transportation providers both time and money, since as “no-show” trips are not reimbursable under most funding streams.

Web Portals

In an effort to implement a one-call,/one-click TMCC, online web portals were envisioned for passengers wanting to make an online trip request and transportation provider(s) who might join the network of coordinated transportation providers but may not have access to the full RouteMatch scheduling and dispatch TS software. TMCC mobility managers could still assign trips to those providers by using a web portal designed to download a manifest of passenger trips coming through the TMCC, enabling them to participate in coordination.

Technology Components: Theory Meets Reality

The goal of MSAA Phase 3 (referred to as Phase I by all eight site grantees and throughout this document) was the planning and design of several TMCC models that would be developed by the grantees and shared with the public. Three of the eight Phase I grantees would have their TMCC designs submitted for competitive selection for implementation under Phase 4 (referred to as Phase II by the site grantees and throughout this document) so that a demonstration of their individually-theorized designs could be observed. The MSAA grantees understood that their plans may not be implemented but that there was value in the effort to implement the TMCC and share the outcomes with others.

This section provides observations involving the technology that was planned for and procured for this demonstration project. A later section addresses non-technological issues that affected the project.

Component Observations

MDT/AVL

The single greatest investment in technology for this project was the purchase of 100 MDT/AVL units for distribution to and installation in the partner agencies' vehicle fleets within the six-county region. LSCOG was able to leverage other grant funds at the same time as the MSAA project and, therefore, could offer an attractive package to the partners. The partners would be able to equip each of their vehicles in the fleet with an MDT/AVL unit from Mentor Engineering. LSCOG also would provide the financial support needed for each unit, including initial installation, licensing, and ongoing maintenance and support for three years. LSCOG also offered support for the necessary wireless data plan from Verizon that each unit used between the spring of 2010 and the summer of 2014.

The systems engineering approach to MDT/AVL resulted in a carefully-timed rollout of this part of the project to each successive partner agency, complete with formal training, a Go Live event, and eventual systems acceptance by the agency's Executive Director.

In some ways, the MDT/AVL technology component was the most successful part of the entire project. Four years after the initial rollout and at the end of LSCOG's financial assistance of the units, all partner agencies have kept their AVL capacity and are making arrangements to support their technology financially moving forward.

Challenges for MDT/AVL

The most serious challenge experienced regarding the MDT/AVL technology component of this project was a pervasive problem with units not functioning properly shortly after installation. Researching the solutions was time-consuming and complex: was it the installation of the unit, the new Verizon wireless hookup, user error and drivers needing more training, the hardware, the Mentor software on the units, or the RouteMatch software interchange that tied the transit data to the scheduling and dispatch software? The failure rate for the units approached 40 percent, and the conclusion was that it was a malfunction with the actual unit—the hardware.

Mentor Engineering took full responsibility for the malfunction and sent two technicians to visit each partner site to resolve the problems. The failure involved screen calibration, and the technicians adjusted and repaired each of the 100 units, including those that had not failed. Mentor Engineering then extended the one-year warranty to a second year. The site visits, repair work, and warranty extension were provided at no additional cost to the project. After this work was completed, the MDT/AVL units, called Rangers, performed as expected.

A second challenge for the wireless MDT/AVL technology component was driver use of the Ranger units. Some had difficulty remembering to press the buttons on their touchscreens that would record the time of arrival and departure from each individual address scheduled on the driver manifest, which prevented an electronic time and location “stamp.” The problem was compounded by drivers later clearing stops on the Ranger when at a different location and time (such as during a break). Drivers continued to carry the paper version of their manifests and made the necessary data entry on the paper version rather than use the electronic version of their manifest loaded onto their Ranger each morning. They did not like the transparency and accountability the Rangers brought to their daily performance and did not understand the significant benefit a Ranger could bring to the verification process by staff. Using the Rangers properly could cut the time needed for verification and billing by as much as 60 percent, if done properly.

A third challenge for the wireless MDT/AVL technology component was that the Rangers on each of the 100 vehicles did not lead to the transparency originally hoped for among the different service providers. An anticipated benefit to coordination was that vehicle locations for network partner A could be seen by network partner B in real time and that information could be used to share or coordinate a trip if it appeared the other agency’s vehicle and driver were available and perhaps closer. This was not possible because a software component involving the many RouteMatch databases and the coordination module did not perform in the manner originally envisioned.

Positive Outcomes for MDT/AVL

Although the MDT/AVL did not allow viewing different agencies' vehicles, it performed well in being able to view the location of all vehicles within one agency's fleet. The transportation service providers in the network stated that this technology has brought improved efficiency to their operations. Benefits identified by the group include better utilization of drivers for scheduling, especially will-call pick-ups; the ability to send add-on trips to the driver manifest throughout the day; the ability to perform playback functions that retrace the route taken by a driver throughout the day, which helps to defend the agency against customer claims that a driver was not at a certain location at a certain time to pick them up; improvements with the verification and reconciliation tasks performed at the end of the day; increased communication with drivers throughout their shift without using radio contact; mapping and GPS support for addresses and locations; and an emergency button for the driver to activate to notify dispatch of a serious problem, if needed.

Coordination Module

The coordination module was considered the most complicated component of the technology procured for the project. This software module was not commercially-available off the shelf (COTS) and was a new concept for RouteMatch to design and implement. The module needed to be compatible with the RouteMatch TS database(s) already in use throughout the region and the state.

Challenges for Coordination Module

As happens with many technology projects, the delivery of the module was delayed. Upon the unveiling of the module and its capabilities, it quickly became apparent that more design work and programming would need to be completed to fulfill the complete vision for the module. At the time of the first-version release of this module, the following capabilities were identified as being important for future releases and improvements:

- Sending trip requests that are standing orders
- Sending same-day trip requests
- Receiving trip data after performance of a trip

The RouteMatch coordination module software developers originally envisioned project partners using the module to coordinate a trip that an owner agency was having trouble performing or desired to share with others. Thus, the module was not created with the ability to send out a trip request for same-day service because the developers did not think it was enough notice for a network provider to post a trip request for coordination (assistance) and be able to receive a timely acceptance/confirmation from a second agency. As a result,

the coordination module had a 24-hour limit on posting trips, which was set up as a default setting that could not be overridden. This same understanding of how the coordination module would be used also led to the inability to place a trip request into the software module as a standing order—assuming that an owner agency want not to give its standing order trips away on an ongoing basis. Therefore, the coordination module was designed and set up to accept trips involving only a single date and time.

These concepts for coordination module utilization were not necessarily wrong; they did accommodate the purposes of coordination between a network agency performing transportation services that wants to offer up a trip opportunity to a fellow network partner without having to go through a mobility manager at the call center to do it. It did not, however, accommodate the greatest usage of the coordination module in practice: the LSCOG/ADTRC mobility manager acting as a broker who wanted to assign a trip to only one agency and not offer it to others.

The LSCOG/ADTRC takes calls from throughout the six-county region on behalf of transportation providers, but the majority of callers are funneled to only one selected transportation provider in the county. This is because of contractual arrangements that may be in place and/or because funding sources that pay for the passenger trips do not want to subsidize the passenger trips outside their targeted population. For example, if Bamberg County is paying the local match for FTA Section 5310 grant funding for eligible trips for older adults and persons with disabilities, it wants its funding to pay only for residents of Bamberg County. If there is only one FTA Section 5310 transportation service provider procured for Bamberg County, then the mobility manager must send the trip requests of Bamberg County residents directly to that procured service provider. That provider decides if it can accept the trip and perform it themselves. These trips often are standing orders for weekly scheduled events (Monday, Wednesday, and Friday for dialysis, for example). The mobility manager must have the ability to send that trip request through the coordination module as a standing order to the one procured provider who is responsible for fulfilling the transportation request. The mobility manager should not have to enter that trip into the software module three times every week or make the passenger call three times each week to request the trip through the call center.

To avoid this problem, the mobility manager at the LSCOG/ADTRC sends the trip through the coordination module for the first date and writes a note in the Comment section that the request is actually a standing order. The network service provider accepts the first trip of a standing order within the RouteMatch coordination module and re-enters the trip into its database as a standing order. Instead of clicking one button for the acceptance of the trip request and having that trip and client information automatically populate directly into the scheduling module of the service provider's RouteMatch software database, it is a two-step

process. Of concern is that the TMCC mobility manager is recording a standing order as one trip (the first one) and is losing the ability to count future standing order trips for that passenger as being serviced or coordinated through the TMCC. Reporting functions for the TMCC are no longer accurate under that scenario.

This was not seen as an insurmountable problem by the developers at RouteMatch because the coordination module was designed to capture trip data on trips performed, which would catch the standing orders not fully entered by the mobility manager. The performed trip data would arrive through the software and originate from the installed Rangers on each vehicle. This would be a way for the TMCC to learn of and count future trips being performed as a standing order for a particular passenger without having to enter the trip repeatedly in the coordination module. However, the function of capturing trip data and sending it back to the TMCC did not work past the opening weeks of deployment. A software upgrade from RouteMatch soon broke that connection, and it has not been functioning properly since that time.

Positive Outcomes of Coordination Module

The coordination module was successful from the beginning in moving information from one agency to another. The TMCC and the network partners have been able to depend on sending and receiving fast and accurate trip requests and client profiles. The module also provides information on assigned funding codes that has been helpful in report generation, and it has been a useful way to communicate with transportation providers and lessen reliance on phones and fax machines as time progresses.

LSCOG and RouteMatch have worked together for years to bring improvements to the software programs involved in this project. Three years after deployment of the coordination module, RouteMatch still conducts site visits and conference calls with LSCOG staff to get input on software performance and identify items in need of enhancement. LSCOG believes this investment in time and interaction has resulted in a better version that soon will be deployed to LSCOG/ADTRC and other TMCC-like agencies around the nation. The RouteMatch database upgrade, version 6.1.08, has been designed to address the three issues discussed above and features enhanced functionality in the module display screen, reporting, and vehicle tracking.

Data Warehousing

AMR worked closely with RouteMatch to design and create a software program that ultimately was housed on a server at the RouteMatch server farm in Denver, Colorado, for the exclusive use of the LSCOG TMCC project. This software program was created to pull transit trip data from each of the individual transportation providers' RouteMatch databases and deposit them in one spot

for access. This was created to fulfill the desire of SCDOT for plentiful and accurate transit data to be mined for both its rural NTD report and for mapping transit trends for short- and long-term planning documents.

Challenges to Data Warehousing

The challenges to this technology were unique, in that it worked exactly as designed from the launch but ultimately was rejected. Viewing the early reports in the data warehouse revealed transit data that could not possibly be accurate; some numbers were so skewed that they were immediately rejected, which put all the data into question.

It was determined that the problems were originating at individual transportation provider sites. RouteMatch's database was collecting information from the Ranger units installed on the vehicles, but because some drivers were not using them properly, trip performance data being collected for the data warehouse were inaccurate as a result. Some partner site staff who understood that the automated collection of transit data was not accurate simply ignored the automated, electronic verification process and input the handwritten entries from the paper driver manifest. In other words, they collected their supporting documentation and manifests in the same manner as before the Rangers were installed. Initial inquiries from LSCOG confirmed that the RouteMatch software was being used for verification, but it was not revealed that transit data from the Rangers was being overridden and entered into the RouteMatch database from the paper manifest. Once this was learned, the need for re-training and more employee buy-in to the new business practices was emphasized. Drivers began to use the Rangers more efficiently, and the verification process began to improve.

Another issue was the that level of cooperation related to data warehousing among stakeholders began to fail. Executive Directors of network partner agencies did not want reports to be collected automatically and viewed by others without them viewing the reports first, especially in light of potential inaccuracies. SCDOT planned to require these agencies to continue to submit transit data manually on SCDOT forms. Also, the Medicaid broker concurrently was issuing written notices to its network of transportation providers that HIPPA prevents certain information sharing, and Medicaid passenger transit data being automatically collected and mixed in with other coordinated trips was cause for concern. Eventually, permission to collect transit data for the data warehouse was soon withdrawn by the individual sites.

Positive Outcomes of Data Warehousing

The desire for accurate transit data is a worthwhile pursuit, and SCDOT, LSCOG, and individual transportation providers all recognized that a better effort needed to be made to ensure this. SCDOT changed its reporting format, and project partners began to appreciate what new technology could do for them

in collecting data. The data warehousing effort revealed that almost none of the agencies report transit data in the same way. SCDOT is leading an effort across the state to provide common definitions for transit terms and get all providers to calculate and interpret their transit data in the same way.

LogistiCare Medicaid Import

With South Carolina changing to a private, for-profit Medicaid broker model with LogistiCare, and with all network transportation providers involved in the TMCC project providing Medicaid transportation under a contract with LogistiCare at the time, this project took on the cost and effort of creating an import between the broker's software system and the RouteMatch software databases in current use.

Challenges of the Import

The challenge of this component was to get software developers at LogistiCare and RouteMatch to find the time to work together to create an import that would allow the broker to assign trips to a transportation provider who then could import all its assigned LogistiCare trips into the RouteMatch without having to manually enter each trip each day. After two revisions, the import was deployed for use; however, one year later, LogistiCare lost its Medicaid procurement from the SC DHHS, so the import was no longer necessary. LogistiCare eventually regained its original position as the Medicaid broker during an emergency procurement after the new broker backed out of its state contract.

Positive Outcomes of the Import

The import between RouteMatch and LogistiCare was successful and performed as expected. The agencies that used it were satisfied with it, and it saved them significant data entry time. Not all network partners used the import, which was a surprise to LSCOG. Inquiries revealed that the import worked best with "clean" client profiles inside an agency's RouteMatch database, but the import duplicated trips if the agency's RouteMatch database did not have clean, accurate client profiles originally entered. Agencies that wanted to benefit from the import took the time to clean up their database first; other chose not to do so and, therefore, did not use the one-click feature to import their trips daily. Cleaning up client profiles to eliminate name spelling errors also helped with the efficiency of other RouteMatch software functions such as reporting. When LogistiCare returned to its broker position, both RouteMatch and LogistiCare fixed the broken links and reloaded the import on any provider database requested. The import is still being used today.

Computer-Aided Dispatch for Fixed Routes

A useful piece of technology became available between the time of the original proposal submission to the MSAA grant funders and the actual deployment of the TMCC sometime later. Originally, the project would support demand-response

transportation service and vehicles used for that purpose. RouteMatch acquired a software product of another company and offered support for a fixed-route transportation mode as well. Aiken County and Orangeburg County had small fixed-route systems operating in their counties, and it was decided to use the money from a new funding source to procure the software needed to interface with MDT/AVL equipment that could be installed on fixed-route buses.

Challenges to Fixed-Route Software

There were challenges to the implementation and use of this software program. Starting as a stand-alone software package, it was later revised to become a module that would be housed within the existing RouteMatch software program. During the transition from one delivery method to the other, the software developed glitches that would take a long time to fix. RouteMatch waived support fees during the down time.

LSCOG was the first agency to purchase the new software, so it served as a beta test site for this technology component. Since RouteMatch and LSCOG/ADTRC staff were interacting regularly during the implementation work plan and providing valuable feedback to software developers, they were the first to note that the fixed-route software was not compatible with the features of the Rangers that had been installed on several fixed-route buses. The software functioned on the Rangers, but it would not capture passenger boardings and alightings at each stop.

RouteMatch approached Mentor Engineering for a software fix that would allow the driver to push buttons on the Ranger touchscreen each time a passenger got on or off at a stop. The stops had already been programmed into the driver manifest sent to the vehicle each day via the Ranger. However, the software solution for this absent feature was not something Mentor Engineering was willing to design and implement. Around this time, Mentor was bought out by a competitor of RouteMatch (Trapeze Group), and joint efforts on product development stopped. RouteMatch had already engaged its software developers to work on tablet AVL wireless technology that would be compatible with Verizon and could eventually replace the Rangers as a less expensive MDT/AVL product. RouteMatch offered free installation of the new Samsung tablet, which was compatible with RouteMatch software, had a Verizon wireless modem that would work with the existing wireless plan, and could display the necessary software features to capture passenger counts at stops.

Positive Outcomes of Fixed-Route Software

The computer-aided dispatch software module for fixed routes was successfully deployed such that the primary agency providing the contracted service and the LSCOG/ADTRC mobility managers can both view the location of buses in real time and monitor schedule performance. The software application on the tablet

also allows messages to be sent directly to the driver, which has been helpful when a mobility manager has communication with a customer who wants to catch a bus along the flag-down fixed route and the driver can be sent a message to be on the lookout for that pickup. Also, the general public can call either the LSCOG/ADTRC location or the network agency performing the general public transportation contractor to inquire about the timing of vehicle arrivals. Both agencies also can draw reports out of the RouteMatch software.

Demand-response passengers are better able to connect or transfer to fixed-route vehicles and coordinate their schedules between the two modes of transportation. This appears to be most helpful to rural passengers who travel into a more urban area that have fixed-route capacity, which opens up more locations for rural passengers than would have been available under their FTA Section 5311 subsidized transportation, which is limited to rural pickups and destinations.

IVR and Outbound Notifications

The TMCC phone system is of vital importance in the implementation of a one-call/one-click center since it is the primary way that passengers make contact with transportation providers. The TMCC design intended to take its phone system a step further and make it a customer service tool that would serve passengers with additional information about their transportation experience.

Challenges to IVR and Outbound Notifications

Technology changes rapidly, and this project was not immune to such changes between the time of Phase I planning document submission and Phase II implementation, a period of 2–3 years. The original design was to provide an upgraded PBX telephone exchange at the TMCC location that could be linked to the other network provider phone systems and provide seamless call routing. This design was not implemented.

At the time of deployment, the TMCC was able to advantage of the expertise of AMR consultants who had set up large call centers in various locations around the United States to service their large ambulance service and emergency response interactions with local authorities, as well as some call centers that serviced large Medicaid broker businesses. These consultants were able to provide clarity in regards to two telecommunication considerations of the TMCC. First, LSCOG did not have the technical capacity in either experience or personnel to provide its own telecommunications system solutions; an off-site hosting agreement would be the most efficient and economical way to meet the phone needs of the TMCC. Second, technology was rapidly moving away from a PBX hard-wired telecommunication system and towards Voice Over Internet Protocol (VoIP) systems. The LSCOG offices were operating an old PBX and voice mail system by Fortran that soon could not be serviced due to its age.

LSCOG was in need of a telecommunication system that would be upgraded for its ADTRC expansion into a TMCC model and for the entire office and all other departments.

The final telecommunication decision was to procure the VoIP services of Spirit Telecom of Columbia, South Carolina, for the LSCOG and include an upgrade of auto attendant services for the ADTRC, which needed a more robust telecommunication solution than other departments within LSCOG. Spirit Telecom provided small team of engineers (doing business as SwampFox) that could work with RouteMatch to integrate the outbound notification system with the telecommunication solution.

Despite significant effort over an 18-month period, the outbound notification system was difficult to integrate into the Spirit telecommunication system, the Rangers, the RouteMatch software, and the ADTRC. At the time, RouteMatch did not have its own IVR solution and had to use third-party vendors to bring outbound notification to any of its projects. Spirit Telecom/Swampfox was selected by LSCOG as a new vendor for RouteMatch. During the course of the next 18 months, outbound notifications worked in the testing phase, but failed shortly afterwards. Fixes for broken VPN connections were frequent between Spirit/Swampfox and RouteMatch. In the end, LSCOG did not renew the ongoing maintenance and support services for the outbound notification module after the first year. The technology did finally work without any glitches, and Spirit Telecomm, Swampfox, and RouteMatch were commended on making the integration of discrete components work. However, the outbound notification ultimately was rejected by the network partners and passengers because of negative passenger feedback or the business practices of the transportation provider agency, which did not support the function of outbound notifications.

Passenger feedback was quickly received after the integration of systems was complete, and the feedback was not as expected. Passengers in Allendale County, for example, began to complain that they did not want their pre-paid phone minutes being used up with trip reminders; they would quickly hang up before entering the requested numbers through the IVR script for confirmation or cancellation of their scheduled trip for the next day. This was especially significant if the passenger had a standing order in the system and did not feel the need to confirm every trip. Passengers also complained that the notification phone calls informing them the vehicle was on its way to pick them up were not helpful since they were not being advised of an exact pick up time as expected; the call to the passenger was generated when the vehicle was supposed to arrive within 10 minutes. This ability was predicated on the Ranger MDT/AVL unit using its GPS capability to send a signal to the outbound notification module, which would then use the phone system to initiate a phone call. Due to “blank spots” in Verizon wireless coverage in some of the rural areas of the region, GPS could not trigger

the notification at the desired time and location, so passengers would sometimes fail to get a call or would receive one while already sitting on the vehicle.

When the outbound notification rollout began at its second partner site, SWRTA in Orangeburg, another issue impeding its success was that scheduling and dispatch staff were not using the RouteMatch software supporting scheduling and dispatch software and databases in a manner that was conducive with new technology. The business practice was to enter a placeholder of “7:00 AM time of pickup” into the schedule regardless of when the vehicle was actually supposed to arrive. It was determined that SWRTA did not use the routing and scheduling engine tool in the RouteMatch software, but rather let individual drivers determine their own routes and schedules the night before performing the trips; drivers would call their passengers the night before to tell them when to expect a pickup arrival time.

This business practice was not discovered during a pre-deployment assessment made by project consultants of RouteMatch. It was later learned that consultants were directed by SWRTA to work with SWRTA staff from the main Sumter office, which used its RouteMatch database in a different manner than the Orangeburg office, unbeknownst to Sumter staff. If the business practice had not changed, it would never have worked with outbound notifications because the RouteMatch software would have “7:00 AM” listed as the pick-up time and the outbound notification module would pull that time and automatically enter it into the night before confirmation phone call script. The passenger would be confused by the 7:00 AM time in the automated phone call, which conflicted with the time the driver had informed them he/she would arrive. The passenger would either hang up or press the number 2 for cancellation because 7:00 AM was not their anticipated pickup time. Cancelling a trip through the outbound notification module using the phone system resulted in that trip being taken off the electronic manifest sent to the driver’s vehicle through the Ranger.

Because of this, rollout to other sites of the partner network transportation providers was rejected as partners began to hear about the problems being experienced at the first three sites, and advance notification calls were no longer a valued aspect of the TMCC project. As a result, LSCOG ceased pursuit of outbound notification.

Positive Outcomes of IVR and Outbound Notification

Although the challenges to this technology component were great, there were some positive outcomes. LSCOG was able to secure a VoIP system and Avaya phone units for its offices and auto attendant capabilities for the ADTRC to handle the increased phone volume that was the result of becoming a call center. Because LSCOG needed to procure its own phone system anyway, the cost to the TMCC project to add a more robust telecommunication solution to the new LSCOG/Spirit Telecom agreement for the ADTRC was less than first

anticipated. Spirit Telecom was, and remains, a procured vendor for the State of South Carolina. It uses a statewide data network of multi-protocol label switching (MPLS) that an increasing number of government offices, municipalities, and others are joining each year. This provides the network transportation partners with the ability to join the MPLS network when their small agencies are ready to switch from their legacy systems. This will enhance future efforts the network transportation providers may have to leverage their agency staffing resources for after-hour or weekend work and have the technology route calls appropriately.

The outbound notification and coordination moduled were the two technology components that needed to span the entire project and form an important bridge between one agency and another and the TMCC call center. While the coordination module was successful in doing so, the outbound notification module revealed that, even with the software upgrade training and the MDT/AVL Ranger training, more training that was needed. Each agency tended to use the RouteMatch TS database for scheduling and dispatch in its own way and was sometimes unaware that it was capable of performing important, time-saving tasks on its behalf. It also revealed that some transportation agencies were in a position to embrace technology and move forward and others were not. This hesitancy was not evident during the planning stages of the TMCC project and was an important discovery.

In 2013, LSCOG was able to use a small mobility management grant that would enable all the transportation providers to be retrained by RouteMatch in their use of the basic and—most important to their operations—TS database for scheduling, dispatch, and billing software. Four of the five sites welcomed this opportunity and benefited from two site visits from RouteMatch consultants to each of their agencies for the express purpose of enhancing the current use of their software package and increasing their skill sets. It is hoped this experience can be leveraged in the future towards more standardization between regional agencies and the way they provide coordinated transportation.

Web Portals

Web portals were part of the TMCC project and originally were designed to accommodate three groups of stakeholders: passengers, out-of-network transportation providers, and medical facility front desk staff who wanted to assist patients with their transportation needs. All three of these web portals would be a product of RouteMatch software and would be tied to the coordination module or directly with a particular agency's RouteMatch scheduling database.

Challenges of Web Portals

The web portals were delivered by RouteMatch Software and were expected to provide an online opportunity for passengers and others to interact with the

TMCC for their transportation needs. The passenger web portal added to the new ADTRC website for public use. However, ADTRC mobility managers did not consider this web portal to be user-friendly for the general public and asked for a “work-around” with which RouteMatch assisted them.

The most important issues with the web portals are four-fold. The first was that passengers using the web portal had to do a search of their address before they could enter it for a trip request. RouteMatch TS scheduling and dispatch software is designed to have agency schedulers “search” the database first, before entering a trip for scheduling. This is an important step in avoiding client duplication in the database. The online web portal being used by passengers was set up to accommodate this database feature but was confusing for the general public to use.

Second, it was also confusing for passengers that when they had completed all the trip entry information online they were given a “confirmation” number. However, this online trip entry was a “request” for transportation and not a confirmation that the coordinated trip had been accepted by the network providing agency. The ADTRC mobility manager still needed to shepherd that trip through the coordination module and determine if it could be performed by a transportation provider and then needed to make contact with the passenger to let them know the outcome.

Third, medical facilities could not use a web portal on behalf of their patients. The barriers were concern over HIPPA and confusion over whether or not the patient was using Medicaid NEMT transportation or some other funding source and eligibility. The ADTRC is not authorized to receive and process requests for Title XIX Medicaid NEMT trips—only a Medicaid broker is allowed to perform this function. Front-desk medical staff had difficult knowing when to use the ADTRC website for trips and to understand the service area.

The fourth reason the web portals were not sustained past the first two years of the project was the difficulty in acquiring additional transportation providers that were outside the network and did not use or have RouteMatch software, but who still wanted to participate in coordinated transportation initiatives. Only one provider felt there would be enough transportation volume within the region to participate, but it lost its private Medicaid contract less than one year later and pulled out of most counties.

Positive Outcomes of Web Portals

Web portal investment and licensing has been obtained and remain available for future use should the transportation environment change in ways that are conducive to reactivating them. Since utilization was low, ongoing support and maintenance were discontinued in 2013. The ADTRC website remains active (along with the LSCOG main website) and provides a way for the public to make contact with the ADTRC for transportation assistance after hours.

SECTION

8

Project Evaluations

The MSAA Phase I and Phase II grant awards were not limited to only planning and deployment at sites; USDOT also made financial provision for technical assistance at the sites and for formal evaluation of all TMCC projects by third-party, independent sources. These efforts were carried out by the following organizations to evaluate and bring insight on this project.

An MSAA Technical and Management Assistance Team was provided by Science Applications International Corporation (SAIC, now Leidos), led by Diane Newton. SAIC also wrote the systems impact evaluation after several site visits to the Lower Savannah six-county region and numerous interactions with LSCOG staff and staff from all five transportation provider network sites. The most active evaluators who visited the region were Chris Armstrong and Jennifer Rephlo-Carter of SAIC/Leidos. Their written evaluation, “Mobility Services for All Americans Initiative: Systems Impact Evaluation Lower Savannah Council of Governments Travel Management Coordination Center, Aiken, South Carolina,” is available to the public at the National Technical Information Service, Springfield, VA 22161.

Also providing technical assistance, especially for systems engineering during the project, was TranSystems of Boston. Santosh Mishra of TranSystems was of particular help during the procurement of the MDT/AVL equipment and implementation.

In early 2013, the network of transportation providers involved in the TMCC project in the region was approached for transit data by Gwo-Wei Torng of Noblis and Yehuda Gross of USDOT for participation in a study that would focus on estimating and simulating the potential impacts of coordination on efficiency and productivity gains based on various “what if” coordination scenarios. Staff from Noblis gave a presentation on June 5, 2013, at the 2013 CTAA Expo detailing the preliminary findings, titled “Simulating the Impacts of Coordinating Human Service Transportation—What Ifs.” The TMCC project in the Lower Savannah Region was one of the scenarios discussed.

Recommendations, Observations, and Lessons Learned

Although there was a formal evaluation process put into place for the TMCC project that was performed by independent third-party sources, MSAA grantees also were asked to share tips, observations, or lessons learned to provide insight that may be helpful to others pursuing a TMCC deployment. LSCOG shares its observations in three areas: technology deployment, grant management, and coordination efforts.

Lessons Learned

Project and Technology Deployment

1. Timelines most likely will change.

The LSCOG experience was one of delays—with technology development; deployment, installations, and rollout schedules; getting information from a multitude of stakeholders involved in the project; and software fixes or upgrades. If possible, delays should be planned and timelines should be planned accordingly. Plans should be put in place to shift staff and their efforts to another part of the project while waiting for other parts of the project to progress. Fortunately, almost any delay experienced in this project resulted in a better outcome than originally expected, so delay was not necessarily negative.

2. Technology most likely will change during the project.

Technology changes quickly, and sometimes it changes in the middle of the project. This TMCC project included a formal planning period, a competitive selection period after submission of formal proposals that included planning documents, grant award, and procurement, a period of software platform upgrade, and a roll out of planned new technologies. This process took place from 2007 to 2011 and made the project vulnerable to changes in technology. LSCOG was able to take advantage of the emergence of a new software package for fixed routes, which was not in the original TMCC design, and an improved telecommunications solution due to advances in technology over the years between planning and deployment.

Conversely, newer and less expensive solutions for MDT/AVL emerged during this time period, and the project was not able to take full advantage of them. Maintaining awareness of the fluidity of technology solutions and asking current

vendors about anticipated changes is recommended. It is possible a project can use the timing of new releases to their best advantage, although it is also recognized that decisions need to be made without concern about the newest gadget on market.

3. Procurement will have a significant impact on the project.

The procurement of goods and services can change original project plans. The TMCC project leveraged the funding of several grants, all from either the federal or state government. Following the many procurement regulations tied to federal or State money may require more effort than originally anticipated. If possible, Requests for Proposals or Requests for Bids should include add-on goods or services that may come up during the project or provide for new advances in technology that may be on the horizon. On the other hand, project plans should be flexible enough to move forward even if procurement of goods and services is not as exactly originally conceived.

4. Integration of various technology components holds the key to a successful deployment.

This TMCC project was large and ambitious, and the scope of work and acquisition of goods was shared among more than one vendor. Part of this is a result of the procurement process and part is because no single vendor had all the parts and pieces needed. However, the parts and pieces did need to work together, and integration often was challenging. If possible, it is ideal to have a prime contractor that can be responsible for all components, thus lessening the need for integration among many vendors. It recommended that the prime contractor and its sub-contractors have worked together successfully in the past. If the integration effort is difficult, it could be difficult to determine the cause and effect and find a solution. Contingency funding should be set aside for the scenario in which a vendor believes a solution is outside the already-negotiated scope of work and fees, thus affecting the timeline.

5. Careful consideration should be given to existing infrastructure.

Most projects will expect (or be expected) to use existing infrastructure and to fit within any published statewide ITS framework. Also, when a new technology project is built onto existing infrastructure, it must be able to “handle the weight.” This TMCC project had to shore up the existing infrastructure by first upgrading the RouteMatch Software TS scheduling, dispatch, verification, and billing software from the original 3.0 version to the new 5.1 platform. This was necessary in order to add the new coordination module to the partners’ RouteMatch database and to take on the use of MDT/AVL units within the software database. This was time-consuming and created the need for a new round of training at each partner site because the software had not been

updated/upgraded in several years. The change from version 3.0 to 5.1 was so significant that experienced schedulers and dispatchers were unable to use the new software.

This upgraded software platform, along with the addition of new software functionality, required a more robust Internet connection and speed than was available at some of the smaller agencies. This affected their ability to use the upgraded software and remain connected to the RouteMatch server farm until their Internet service was upgraded, which proved to be difficult because the agencies were part of the local county government structure and the transportation agency could not make this decision and expenditure on their own.

Licenses and the status of product warranties and support/maintenance agreements should be checked for all existing infrastructure involved in the project. LSCOG discovered midway through the project that the largest volume transportation partner had lost its software licenses in a previous year when SCDOT “pulled” them due to non-use and gave them to another agency in the state that was using the RouteMatch software robustly. LSCOG scrambled to secure additional software licenses only shortly before that agency received its agency-wide training sessions. (RouteMatch was very generous with its assistance in this regard.)

Bandwidth and capacity for voice and data should be double-checked early in the planning stages. LSCOG had to upgrade the fiber optic and trunk lines coming into the building that housed the ADTRC/TMCC in order to support the new telecommunications system. LSCOG also needed to provide computers and monitors to several agencies that needed more computing power than their older computers were capable of providing.

Existing infrastructure should be in the best shape possible before migrating to a newer, upgraded solution. Many partner transportation agencies would have benefitted from cleaning up their databases before being moved to a higher software version. Duplication of client profiles and database entry errors were magnified after the migration and had to be addressed for some of the agencies. Especially important is the task of geo-coding addresses in the database; agencies that did not this found themselves at a disadvantage when the new MDT/AVL units relied so heavily on geo-coding to perform at their best.

6. Serious consideration should be given to off-site, hosted solutions.

LSCOG had to compare each technology component that may require in-house specialized skill sets to the option of contracting outside the agency for these services. In the original planning documents, LSCOG planned to host its own servers for the RouteMatch software and the PBX (VoIP) for the new call center phone system. In the end, both of these services were handled by off-site hosts.

7. Try to purchase technology that is COTS.

Commercially-available off the shelf (COTS) technology is most desirable. This project was a research and demonstration project and involved newly-developed technology solutions for the coordination module, the data warehouse, and the LogistiCare import, all of which were valuable components but took extra time and level of effort to deploy. What was not fully understood by LSCOG at the time was how new the outbound notification module was and how IVR integration was not as advanced and well-developed as originally believed. This made a larger part of the TMCC project subject to a form of beta testing, leading to some high levels of frustration.

Another dynamic present in the TMCC project was that the newly-developed products employed by the ADTRC and its partner agencies meant spending time in the early years being “unique,” causing some delays in or problems with software updates.

8. Double the training budget.

Various methods of training were employed in the project, including agency-specific, onsite training; off-site aggregate group training sessions; Internet-based online training material; conference calls with GoToMeeting viewing capability; and written training manuals. In this project, the best training results were with onsite, agency-specific training sessions repeated over two days so that the staff could be divided into two groups—one to cover the workload, the other to receive training. This also was the most expensive form of training. Also, it is recommended that each agency select a person to become an in-house subject matter expert who can serve as the staff trainer during turnover and for new hires.

9. Insist on as much standardization as possible.

Standardization should be valued above site-specific business practices or unique “work-arounds” that some agencies use in their operations. This created quite a challenge during the deployment of certain technologies in this TMCC project. Since the project was building upon an existing ITS infrastructure of the original v3.0 RouteMatch software, agencies had a few years to tinker with the way they used their software packages and special-order customized reports from RouteMatch. These custom reports created a challenge when upgrades occurred; in the end, they had to be discarded altogether. Fortunately, RouteMatch had improved the reporting capability of the newer software versions enough that the partners could be convinced to give them up.

10. Secure a systems engineer, if possible.

LSCOG benefitted from a technical advisor familiar with systems engineering who had been provided by USDOT for this TMCC project. Not everyone

will have this kind of access to technical assistance, but it will be needed if a technology project is large and complex. It is recommended that this technical resource or systems engineering consultant be from an outside, independent source and not just a resource offered by the technology vendor.

Grant Management

11. Procurement should involve both grant managers and technical personnel.

The technology procured for certain projects can be complex enough to overwhelm a lay person or even the project managers. This often means that technical personnel will play a larger role in the procurement of technology for a medium to small organization that does not have its own procurement department. Relying on technical personnel to develop the procurement's specifications and manage the procurement should not be done to the exclusion of a grant manager who is experienced with general local, state, and federal regulations surrounding procurement. A successfully-deployed technology project will be considered a failure if there are ineligible grant expenditures or disqualified procurements discovered later in the review process.

12. Carefully choose the method of procurement.

Several procurement factors must be taken into consideration: Does the project need to use a Request for Proposal or a Request for Bid method? Is there a qualified use of sole-source procurement involved? Should a "piggyback" clause be added to the procurement document for others to use later if trying to expand the TMCC concept at an identified future date? If able to purchase goods and services off a State contract, was due diligence conducted first to verify that the State followed the guidelines the agency would have been required to follow if the project uses federal funding? A common oversight is that federal regulations do not allow for an in-state preference or advantage during the procurement process; however, the State's procurement method may allow extra points to be scored for in-state businesses. During a federal grant review, the project may be asked to prove that in-state preference was not used when purchases were off a State contract for project goods and services.

13. Include flexibility in the written scope of work or vendor contracts.

The project may experience delays, learn of improved technology solutions, need unexpected funding for consultants or attorneys, have to re-train staff using new technologies, or desire to pre-pay some ongoing support and maintenance fees for acquired technology, all of which are contingencies that could/may be built into the planning documents and processes. Sometimes grantees become so involved with planning projects and their expected positive outcomes that they

do not address, in advance, the possible negative situations they may have to deal with along the way or a new opportunity to improve upon the original vision for the project.

14. Plan for future sustainability and identify all ongoing fees.

Future sustainability is always a challenge. This TMCC project was able to leverage five separate grants to perform full deployment and sustain it for the last three years since its launch in August 2010. LSCOG made full use of mobility management funds available under rural Section 5316 and 5317 programs. Under MAP-21, Section 5316 and 5317 have been changed to stand-alone programs, and State DOTs have to treat traditional Section 5310 funding in a different manner. Potential grantees must stay on top of the changing transportation funding and legislative environment when planning for sustainability.

LSCOG benefitted from receiving permission to pre-pay some of the ongoing technology fees for this project. This is a very helpful strategy and should be considered during the vendor contracting process. Careful attention should be paid to fully understanding all ongoing fees that may be involved with a large technology deployment. If the cost is being shared across organizations, then a Memorandum of Agreement between agencies is necessary.

Coordinated Transportation Efforts between Agencies

15. Determine who will be at the stakeholder and planning table.

Interviews with partners in this TMCC project resulted in the recommendation that planning and deployment meetings cover the entire spectrum of the participating organizations. In other words, whereas executive directors of agencies may be needed at meetings where the scope of the project and the inter-agency agreements are coming together, some provision for the actual operators of transportation service or front-line staff to provide feedback should also be arranged. Executive directors of human service agencies that provide transportation services must cover other services within their agency (such as Title IIIB aging services), and they may not be familiar enough with day-to-day operations of transportation to appreciate how a TMCC project is being planned and implemented.

16. Advocate for flexibility from the state agency funding Medicaid Title XIX transportation.

Medicaid NEMT transportation is the most extensive transportation service being offered in the rural regions of most states, and its impact on coordinated human service transportation cannot be overstated. The State of South Carolina is making progress in its effort to get DHHS together with other stakeholders of human service transportation and SCDOT to discuss Medicaid transportation

impacts and more flexible coordination efforts that could be pursued together in the future. Planners of any future TMCC project should review the Medicaid transportation landscape in their state, look at upcoming state procurements, and try to become directly involved in any statewide coordination coalitions or formal efforts. Being actively involved or at least understanding any existing or anticipated Medicaid transportation initiatives or contracting processes will be valuable.

17. Establish relationships with healthcare agencies that serve as common destinations.

It is valuable for healthcare facilities to cooperate with human service transportation providers in allowing multiple patients to be treated at a common appointment time for treatments such as dialysis or chemotherapy. Having pre-assigned pickup times or uncoordinated drop-off times for passengers who have a common destination is a barrier to trip sharing and the efficient use of driver and vehicle resources. Being able to control will-call commitments for transportation providers serving standing-order trips can be vital to coordination.

18. Have coordinated human service providers in the project agree early on common issues.

LSCOG's experience has shown that the project would have been even stronger if the stakeholders had reached agreement on the following issue early on:

- A rate structure for sharing the performance of trips between agencies and how it will be invoiced.
- Policies on how to be held accountable for any performance measures demanded by funders for trips shared between agencies.
- Policies on how to treat reporting obligations to transportation funders and how to handle getting credit for transit performance data when it affects funding.
- Transfer locations for trips shared between agencies and protocols for driver behavior if another agency's vehicle is late or does not show up.

19. Do not underestimate the power of self-interest.

Any TMCC project that involves multiple agencies coming together for coordination must address each agency's concerns, fears, and hopes. It is important to recognize that an individual agency's self-interest is going to be paramount, and this could make or break a project. All should have the opportunity to speak and be heard, and stakeholders should be sought out privately if they have not expressed themselves in more public venues or perhaps offered a confidential survey. Assumptions should not be made when pursuing a vision and mission for the TMCC. Also, recognize that things change for agencies

over time, so they may need to be consulted again to ensure understanding of their position on the TMCC. Try to identify with each stakeholder what would get their buy-in or what might make them leave the group effort, so you can ensure a realistic effort.

20. Have a responsible and committed TMCC project “champion.”

All stakeholders will want to see the TMCC vision come to fruition, but they may not have the time, energy, or commitment to make it happen; they may, however, support someone else helping them. Once a project champion has been identified, it should take the responsibility for scheduling meetings and setting the agenda, taking and distributing meeting minutes, seeking out funding opportunities to present to the group, taking the pulse of the legislative environment, and participating in conference calls, webinars, and conferences in which coordination of human service transportation is being discussed. These basic tasks set the foundation for inter-agency cooperation and the pursuit of coordination.

Stakeholder committee work will enable such things as creating a vision, mission, and scope of work for the group; setting goals and timelines for group accomplishments; and developing budget estimations and broad policy/protocol for shared trip performance.

SECTION
10

Grand Opening Event and Information-Sharing

After years of planning, partnership building, and working with a large group of stakeholders, LSCOG and its project partners at the Research and Innovative Technology Administration (RITA) of the USDOT believed in the importance of holding a highly-visible and celebratory Grand Opening for the TMCC. LSCOG staff planned and orchestrated an event that exemplified the standards of quality customer service and community solidarity with partners and stakeholders, characteristic of the project.

The Grand Opening was held on August 17, 2010, and included both a ribbon-cutting for the new wing of the LSCOG building and a celebration luncheon for more than 100 people at the nearby Convocation Center of the local branch of the University of South Carolina.

Figure 10-1

Ribbon cutting ceremony, August 2010



Dignitaries cutting the ribbon at the ADTRC included Hart Baker, Secretary, SCDOT; Althea Smith, transit advocate; Ronnie Young, Chair, Aiken County Council; Peter Appel, RITA Administrator, USDOT; Roger Hill, LSCOG Chair; Yvette Taylor, FTA Region IV Administrator; Tony Kester, Director, Lt. Governor's Office on Aging; and Wayne Rogers, Executive Director, LSCOG.

Figure 10-2*ADTRC grand opening luncheon*

The luncheon included a mini-technology trade show, with displays of some of the technology used in the project. The luncheon was made financially possible thanks to some of the technology partners involved in the project: RouteMatch Software, Mentor Engineering, American Medical Response, and Spirit Telecom. A printed program for the luncheon included names of the numerous partners involved, descriptions of the technology employed in the project design, a background highlighting the development of the project, and a written word of appreciation to the many who helped to bring this vision to reality.

Speakers included Peter Appel, RITA Administrator, USDOT; Yvette Taylor, FTA Region IV Administrator; Hart Baker, Secretary of SCDOT; Tony Kester, Director of the SC Lt. Governor's Office on Aging; James McLeary, an ambassador of United We Ride; Lynnda Bassham, MSAA Project Director for LSCOG; a representative of the transit partners in the coordinated transportation network; and a transit advocate and passenger who spoke about how learning about and using public transit had enabled her to change her life;.

Since the implementation of the ADTRC in 2010, LSCOG has been on a continuing journey of trial and error, successes and failures, and improvements and enhancements as it refined the design, and it has stood the tests of reality. The project has been recognized by national and state organizations, including the National Association of Development Organizations; the SC Association of Regional Councils, which named it their project of the year in 2010; and SCDOT, which gave LSCOG its Director's Award in 2011 for the development of the TMCC/ADTRC.

Staff from the ADTRC have made presentations at national and state conferences about the one-call/one-click center and its development. This includes invitations

to present at the Community Transportation Association of America, the National Association of Area Agencies on Aging, the Alliance of Information and Referral Systems, the National Association of Development Organizations, and the National Rural Intelligent Transportation Systems Conference. The National Transit Institute brought a Transit Technology class for a field visit during one of its workshops, and numerous visitors from other states have called or visited LSCOG to share ideas and ask for information about TMCC development and operations, lessons learned, and adapting ideas for local use. LSCOG has been generous in sharing time and information with others who are trying to establish similar one-call centers to assist the public and to incorporate technology in transit operations and coordination.

Figure 10-3
ADTRC marketing sign



Conclusion

LSCOG is one of 10 regional planning and development Councils of Government agencies established in South Carolina and represents six counties in the southwestern part of the state. It was competitively successful in becoming one of the eight national finalists for an MSAA Phase I planning grant in 2007 and was one of three finalists awarded MSAA Phase II implementation funding in 2009. With this funding, LSCOG was expected to create a TMCC model that would procure and deploy ITS to demonstrate the impact technology could have on the coordination of human service transportation.

With the help of outside consultants, a technical advisory committee, FTA project managers, federal evaluators, vendors, and a systems engineering approach to implementation, LSCOG secured and deployed many different technologies as part of the MSAA demonstration project. Successful ITS deployed during the demonstration included 100 MDT/AVL units; a new phone and auto attendant call center equipment for the ADTRC in Aiken; enhanced software components created by RouteMatch Software, Inc., to aid in the coordinated scheduling of transportation among the various transportation partners; new software that could track in real time the fixed-route vehicles being used in two different counties (vs. only demand response vehicles); and new RouteMatch software and databases for two partners that did not have that technology already in place.

In addition, a new website was created for the ADTRC, and web portals were installed for use by the general public and transportation providers who wanted to join in coordinated transportation in the future but lacked the comprehensive RouteMatch software package.

The single most significant issue between Phase I planning and Phase II implementation was the decision by the State of South Carolina to change its Medicaid transportation to a for-profit broker instead of continuing to use the long-established single transit provider in each county. These single county transit providers were the original LSCOG MSAA partners in the project, and their operations and client base changed drastically over the first three years under the brokerage system, which resulted in a pull-back from the network transportation providers' earlier interest in consolidating and centralizing certain operational duties as it was originally considered during the planning stages of the new TMCC model.

The most significant change in the work of the ADTRC mobility managers has been increased call volume. The following table shows the number of incoming calls during the first three years after implementation.

Figure 11-1
ADTRC Call Volume

	2011	2012	2013
Total ADTRC calls	18,510	20,287	19,041
Number referred for transportation assistance	11,667	12,668	13,478

This report details the originally-expected (vs. actual) benefits of each technology component pursued by the TMCC project and provides a list of recommendations, observations, and lessons learned from experiences gained with technology acquisition and deployment, grant management, and the coordinated transportation efforts among the participating agencies.

LSCOG worked with many stakeholders and supporters during the implementation process of the ADTRC. Since its formal Grand Opening in August 2010, it has continued to enhance and improve the technology and services provided from this realized version of the TMCC concept promoted by the MSAA initiative. LSCOG is committed to sustaining the ADTRC and its role in coordinated transportation in the coming years.



U.S. Department of Transportation
Federal Transit Administration
East Building
1200 New Jersey Avenue, SE
Washington, DC 20590
<http://www.fta.dot.gov/research>

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Washington, DC 20590
<http://www.fta.dot.gov/research>