

Memo

To:	Murat Omay, Senior Transportation Program Analyst, Office for Research,
	Demonstration, and Innovation (TRI), Federal Transit Administration, U.S.
	Department of Transportation
From:	Mary Blumberg, Manager Strategic Planning and Development, Aging and
	Independence Services Group
CC:	Tim Quinn. Carly Harper, Cyndi Burke
Date:	October 27, 2017
Re:	Simply Get There – Task 5 – Implementation Plan

The following technical memo provides a proposed phasing and implementation plan for the full deployment of the enhanced Simply Get There web application. The recommendations are based on industry best practices for mobility management, mobility on demand, and regional transportation coordination. User cases were conducted via multiple end user stakeholder meetings. The final application or solution must address user needs and handle all major use cases. We have used industry standard requirements documentation methods to capture all major requirements.

This document will integrate all previous deliverables into a single document including: concept of operations, functional and business requirements, API requirements, design and architecture requirements, and technical specifications for the new functionality.

Concept of Operations Summary

The Atlanta Regional Commission (ARC) is the regional planning and intergovernmental coordination agency for the 10-county area including Cherokee, Clayton, Cobb, DeKalb, Douglas, Fayette, Fulton, Gwinnett, Henry and Rockdale counties, as well as the City of Atlanta. For over 65 years, ARC and its predecessor agencies have helped to focus the region's leadership, attention and resources on key issues of regional consequence.

ARC was awarded a Mobility Services for All Americans (MSAA) cooperative agreement by FTA in July 2015 to pursue a second phase of the Simply Get There project. The MSAA program began in FY 2005 with the goal of helping older adults, persons with disabilities, and economically vulnerable Americans to access their daily needs using transportation. The ARC shares the United States Department of Transportation's (DOT's) desire to improve the transportation system for all Americans and has been partnering with DOT and local partners in order to improve it. In addition to developing its first Human Services Transportation (HST) plan in 2007, the Atlanta region published a Travel Management Coordination Center (TMCC) concept in 2008 with FTA funding. Findings from the 2008 TMCC study supported the development of an HST Advisory Committee and an update of the Coordinated HST Plan to facilitate greater coordination of HST transportation services throughout the region. ARC also received funds during FY 2011 and 2012 to develop a one-click/one-call application called Simply Get There (SGT), which began operating in 2015. The most recent round of MSAA Deployment Planning cooperative agreements will allow ARC to create system specifications for a web-based application that will bring the system forward from "trip discovery" (pinpointing options) to "trip transaction" (centralized booking, scheduling, and dispatching).

Section 2 provides an in-depth background of the current web application that the project will leverage or extend to a more comprehensive travel management coordination platform. SGT is the current trip planning and trip discovery application developed and deployed. The web application is currently deployed and utilized by multiple users and agencies in the Atlanta region.

If the website is not an option for a user, they can call the Aging and Disability Resource Connection (ADRC) for assistance over the phone. This project includes a robust training and dissemination initiative, which includes sharing the website at public events and training users and caregivers and support staff who may work with users. To date ARC has worked with over 80 partner organizations and trained over 1,000 residents.

The current project will leverage this application and, potentially, architecture to extend the scope of the functionality to support a multi-modal, regional transportation coordination platform. Key functional areas to be considered in the next phase include:

- Centralized Resource Management
- Centralized Eligibility Determination
- Web-Based Reservations
- Automated Scheduling and Provider Assignment
- Provider Management and integration to existing Information and Referral System (ESP)
- Transportation brokering and least cost most appropriate provider assignment
- Automated Dispatching
- Automated Payment
- Automated cost allocation and invoicing
- Regional Trip Coordination
- Transportation Analytics

Integration considerations for the coordination platform will consider the following:

• Third party scheduling and dispatching application integration

- Customer Information and Access
- Real Time information integration
- Provider communication and integration
- Transportation Data Exchange
- Support for "no tech" providers
- Security and Privacy

Multi-modal considerations for the coordination platform will consider the following:

- Transportation Network Companies
- Real Time Fixed Route Information
- Vanpool Integration
- Provider database expansion and integration

The planning phase of this effort is underway and includes the following, the first three bullets of which are deliverables in this Cooperative Agreement:

- Development of a Concept of Operations
- Stakeholder engagement
- Travel Management Coordination Platform (TMCP) Design
- Determine technology toolset and functional requirements to expand capacity in existing providers and integrate the trip planning / discovery process into the service delivery operations

Stakeholder Engagement:

The concept of operations document has been developed with extensive feedback with stakeholders. ARC recognizes that Simply Get There's enhanced capabilities must be based on the needs of users, including end users and partners such as transportation providers, in order to achieve its overall objective to improve mobility for residents through the Atlanta region. Therefore, ARC began the project by engaging stakeholders who had been involved in the initial phase and identifying additional potential partners. Because there had been staff turnover at a number of agencies between the initial phase and the launch of phase 2, ARC staff met one-on-one with new points of contact to build relationships and ensure buy-in from new staff to the project. After those initial meetings with new staff, ARC held a series of group meetings for all stakeholders to gather their input and feedback. This stakeholder engagement was a valuable part of the information gathering that informs this concept of operations document. ARC will continue to engage stakeholders as we move through additional steps of phase 2 and through the future.

Stakeholder meetings have been conducted with the following stakeholder types:

- 1) Technical Stakeholders, including people who develop and use software applications
- 2) Agency Stakeholders who work with older adults and people with disabilities
- 3) User Stakeholders, including residents who may have been trained on the software and who are the target populations for human services transportation

Multiple stakeholder events have been conducted to:

- Educate stakeholders on SGT features and functionality
- Educate stakeholders on the next phase of SGT

- Get feedback from stakeholders on feature gaps, workflow, and process.
- Incorporate stakeholder feedback into concept of operations. Feedback on requested features

and functionality will be included in the prioritization and design process.

Stakeholder topics and discussions revolved around the following questions:

- Describe your agency and transportation program?
- Key challenges in coordination or mobility?
- Familiar with SGT and how it could assist your consumers?
- Does anyone currently utilize this type of system? If so, how?
- What are key functional areas that your organization may need relating to fixed / demand response trip planning?
- Do you currently use software for transportation management? If so, what vendor?

Key agency and user stakeholders included:

DARREN WALLACE	DEPARTMENT OF VETERANS AFFAIRS
JESSICA GILL	Cobb Senior Services
CAROL ROWE-JONES	Gwinnet County Senior Services
STEPHEN ARMOUR	Goodwill Industries
DAWN HARDESTY	Noblis
CANDACE KORTOVICH	North Fulton Senior Services
CHARLENE WILDER	FTA
MARSHAREE O'CONNOR	Atlanta Regional Workforce Board (ARWB)
KENYATA SMILEY	MARTA
DIANE REED	Henry County

 Table 1
 - Individual Stakeholders

The Simply Get There (SGT) Comprehensive Stakeholder Team includes:

SIMPLY GET THERE PARTNER	POINT OF	EMAIL
ORGANIZATION	CONTACT	
AGING AND DISABILITY RESOURCE CONNECTION (ADRC)	Cara Pellino	cpellino@atlantaregional.com
ARC TRANSPORTATION ACCESS AND MOBILITY MANAGER	Cain Williamson	cwilliamson@atlantaregional.com
AREA AGENCY ON AGING (AAA)	Kathryn Lawler	klawler@atlantaregional.com
ATLANTA REGIONAL WORKFORCE BOARD (ARWB)	Marsharee O'Connor	MO'Connor@atlantaregional.com
ATLANTA UNITED WAY 211	Don Zubler	dzubler@unitedwayatlanta.org

CENTER FOR VISUALLY IMPAIRED	Anisio Correia	acorreia@cviga.org
(CVI)		
COBB COMMUNITY TRANSIT (CCT)	Vida Covington	Vida.Covington@cobbcounty.org
DEKALB OFFICE OF SENIOR AFFAIRS	Sandra Morrow	skmorrow@dekalbcounty.ga.gov
DISABILITY LINK, THE CENTER FOR	Ken Mitchell	KMitchell@disabilitylink.org
INDEPENDENT LIVING (CIL)		
GEORGIA COMMUTE OPTIONS	Ryan Ellis	rellis@atlantaregional.com
(GCO)		

Simply Get There Requirements Summary

The Simply Get There minimum viable product (MVP) will provide an end to end solution for the mobility management, online reservations, provider management, scheduling, routing, and dispatching. An MVP is the minimum amount of functionality that must be built to be able to successfully sell and solves a large percentage of the problem. This allows you to get the product to market faster, gain valuable customer feedback, add / modify features, re-deploy to customer, and continue the iteration. Agile development methodologies are recommended for this approach.

The following document provides a high-level description of major features and functionality required for the paratransit / demand response market. Target market consists of small to medium sized paratransit, NEMT and senior service providers.

Requirements are broken down into major modules that will need to be developed to support data management requirements, scheduling and routing, and dispatching. The requirements define a "minimum viable product" or MVP. An MVP is the minimum amount of functionality that must be built to be able to successfully sell and solves a large percentage of the problem. This allows you to get the product to market faster, gain valuable customer feedback, add / modify features, re-deploy to customer, and continue the iteration. Agile development methodologies are recommended for this approach.

Core modules for could include:

- 1. Customer Management
- 2. Provider Management (integrated to ESP)
- 3. Vehicle Module
- 4. Drivers Module
- 5. Reservations Module
- 6. Provider Assignment
- 7. Automated Scheduling
- 8. Route Optimization
- 9. Dynamic Dispatching
- 10. Reporting and Cost Allocation

11. Administration

* Integration to existing Simply Get There and ESP Plus is mandatory. API considerations will be developed in the next technical memo.

ARC will be responsible for these modules and their implementation. The systems will be redundant through duplication of critical components or functions of the system with the intention of increasing reliability of the application or system in the form of a back-up or fail-safe or to improve actual system performance. Redundant storage options in the system design enables customers to store critical, non-reproducible data at higher levels of redundancy. It provides a highly valuable solution for distributing or sharing content that is durably stored elsewhere, or for storing thumbnails, transcoded media, or other processed data that cannot be easily reproduced. The option stores objects on multiple devices across multiple facilities, providing exponential times the durability of a typical disc drive.

Technical Considerations:

- 1) Address Geocoding
- 2) Vehicle Routing Problem
- 3) GTFS Fixed Route Integration
- 4) Real Time Traffic
- 5) ETA Calculation
- 6) Generic Base Mapping

Route optimization tools and API's will be used to solve the schedule / route problem. Application will provide required trip, route, and depot data. API will provide schedule, route, and route lines. Schedule parameters will be defined in application and passed to API. Schedule display and management will be handled by client.

Developers must focus on usability, user experience, and performance. Application will be 100% web-based and sold as a SaaS solution. Target markets will include the small to medium transit agencies and senior services markets.

Design Considerations:

- 1. Open and Published API Support
- 2. Broker / Provider Support
- 3. Transit "Partners" Coordination
- 4. Multi tenancy
- 5. User Experience
- 6. ARC Back Office Integration (ESP Plus)

Users Types:

- 1. Data Manager
- 2. Reservationist
- 3. Scheduler
- 4. Dispatcher
- 5. Billing / Invoice
- 6. System Administrator

Roles and Permissions:

System should be architected for easy assignment to user types based on user roles and permissions. Create Write Update Delete (CRUD) roles and permissions should be assigned to user roles and types. Module level permissions and field level permission sets should be designed to model user role access and organization data needs. Single sign on based on user assigned roles is optimum.

Workflow for application should include:

- Create and Edit customers
- Create and edit vehicles
- Create and edit reservations
- Create and edit schedules
- Dispatch and monitor performance
- Report and bill on transportation performed with strong exception reporting capabilities

Architecture and API Technical Summary

This section provides a high-level overview of key technical and architectural concepts. A base or foundation understanding of these will become important in the business model, cost structure, and application re-design / re-architect business decisions in the future.

Technical Summary

This Working session will provide a <u>high-levelhigh-level</u> overview of key technical and architectural concepts. A base or foundation understanding of these will become important in the business model, cost structure, and application re-design / re-architect business decisions in the future. The detailed presentation is attached to this memo.

- Service Oriented Architectures*
 - o Web Services refers to the technologies that allow for making connections.
 - Services are what you connect together<u>connect</u> using Web Services.
 - A service is the endpoint of a connection.
 - A service has some type of underlying computer system that supports the connection offered. The combination of services—internal and external to an organization—make up a service-oriented architecture.

* Reduced Redundancy Storage is:

- Defined with a Service Level Agreement
- Designed to provide 99.99% durability and 99.99% availability of objects over a given year. This durability level corresponds to an average annual expected loss of 0.01% of objects.
- Designed to sustain the loss of data in a single facility.
- Best Practice: Representation State Transfer (REST)
 - o It is a style; not standard
 - o Best practice for implementing web-based applications and services

- o Applications built on this framework are considered "RESTful"
- o Best example of this framework: Internet
- Cloud Computing
 - Cloud computing is a model for enabling ubiquitous, convenient, ondemand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction
 - Characteristics
 - On-demand self-service
 - Broad network access
 - Resource pooling
 - Rapid elasticity
 - Measured service
- Software as a Service
 - Software as a Service (SaaS) is what most people mean when they say "the Cloud."
 - o SaaS provides a complete software solution.
 - The easiest way to think about SaaS is that it is some type of standard software package that can be used on demand and is paid for by subscription, by use, by advertising, or by sharing information
 - Platform as a Service (PaaS) may also become relevant to ARC.
- Extended Markup Language (XML) Electronic data interchange
 - Popular standard for application and data sharing
 - Commonly used in web services for presenting, communicating, and storing data
- Application Programming Interface (API)
 - APIs allow for the creation of a minimal interface that is relatively stable that can be used by other software systems to access or manipulate the underlying systems or data.
 - This allows for enhancements to the underlying systems or data without disturbing the software systems that use the API
- Security and Authentication
 - Authentication is the mechanism you use to verify the identity of visitors to your Web site or Web application. Typically, you do this by assigning a user name and password to a visitor or allowing a visitor to anonymously access public content on your site.
- Software Development Methodology Best Practice
 - o AGILE
 - An iterative methodology that focuses on 'agility' An iterative methodology that focuses on 'agility' and 'adaptability' in development. Instead of one time-consuming and rigid development schedule,

- Every aspect of development i.e., requirements, design, etc. is continually revisited throughout the lifecycle.
- Design is not set in stone and is kept open to last minute changes due to iterative implementation and allowed to evolve as new ideas come in with each release.
- The team structure is cross functional, closely knit and selforganizing.
- Customer will be provided demonstrations at the end of each iteration (sprint) and their feedback may determine the next course of changes in the next iteration.
- The iterative cycle continues till the customer is delivered with a product which exactly meets their expectations.

Implementation and Budget Estimate

The following section outlines a proposed implementation schedule and budget based on the user's highest priority business requirements. Major feature and functional components are bundled into logical feature sets. It is expected the project can be fully implemented in three major phases with the first phase addressing the major pain points of the project.

Project goals include:

- 1) Integration with Simply Get There trip discovery web application
- 2) "Trip triaging" capabilities to find ideal cost/accommodations match
- 3) Data analysis/monitoring to find efficiencies and influence planning/future implementation in a system-wide feedback loop

Additional functions to support project goals include:

- 1. Ability to create client profiles with permissions to use multiple providers, records of current eligibility, trip accommodations needed, and indication of other programs they might join
- 2. Ability to schedule a trip
- 3. Ability to pay for a trip
- 4. Ability for ARC or a provider to charge a user and for ARC to pay a provider
- 5. Information on and ability to schedule travel coaching/training assistance
- 6. Cross-modal trip booking and connections to manifest creation and scheduling systems as well as route optimization across modes
- 7. Payment and billing Cost sharing calculated on back-end
- 8. Modular system ("plug and play" system that users could adapt to local needs)
- Integration with third party systems, including Computer- Aided Dispatched /Automatic Vehicle CAD AVL software, Google, Google Maps, RouteMatch, and Trapeze
- 10. Ability to track trips by the funding source
- 11. Ability to generate invoices
- 12. Web-based application that can be hosted or deployed locally on ARC servers or a location of ARC's choosing

- 13. A robust API to map data from other ARC and partner systems
- 14. Ability to house some transportation provider information on this application, rather than pulling all information from two external databases
- 15. Ability to be 508 compliant

The major new functional modules and extensions to support the goals above may include:

- Centralized Eligibility Determination
- Centralized Resource Management
- Automated Web Reservations
- Electronic Payment
- Automated Scheduling and Provider Assignment
- Route Planning and Optimization
- Multi Modal Transportation Coordination
- Real Time Asset Tracking and Dispatching
- Transportation Verification
- Transportation Data Analytics
- Customer Mobile App
- Driver Mobile App

Phase 1 – Web Based Reservations

Major function components of phase 1 include:

- Centralized Resource and Eligibility Management
- Automated Web Reservations
- Billing and Cost Analytics
- Regional Transportation Coordination API

Resource Management

Creating and editing customer demographics including default address information (geocoded), eligibility information, capacity and constraint related parameters (mobility needs, PCA's, guests, etc....), trip related data (trip purpose, trip type), and billing information. Information below defines the core data management requirements for customers.

Major Functions:

- SEARCH Searching for Customers
- NEW Creating New Customers
- EDIT Editing Customers
- DELETE Deleting Customers

The vehicle module simply provides users the ability to define the type of vehicles operated and their relevant characteristics. This data is very important for route and schedule optimization. Vehicle data will be passed into scheduling tools. Much of the data below is required by FTA for National Transit Database (NTD) annual reporting.

Key considerations for managing vehicles in proposed system:

- Vehicle Capacity
 - o Ambulatory Seats
 - Wheelchair Slots
- Vehicle Availability
- Vehicle Requirements
 - o Drivers must have this capability to be assigned to it
- Vehicle Pull In / Pullout (Garage Location)

Web-Based Reservations

The reservation module allows customer service representatives (CSR) to quickly and easily book trips. There are two types of trips:

- Demand Response (single trip)
- Standing Order (recurrence pattern)

Major functions include:

- New Reservation
- SEARCH for Reservation
 - Easy and flexible search functions.
 - Once customer with trips is identified, user can edit record
 - EDIT
 - DELETE
 - COPY
- Schedule / Assign to provider
- API support to coordinate transportation request

Billing and Cost Allocation

Trip billing, invoicing, and cost allocation will be a major feature set in phase 1. This includes the following features:

- Trip Cost Estimation based on contract or program billing rules
- Billing verification and eligibility
- Third party billing and invoicing
- Cost analytics and allocation

Phase 1 - Implementation Estimate

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	Application Development Fees			Annual Application Annual Technical Hosting Support			Timeframe			
		Low		High					Low	High
Resource Management	\$	75,000.00	\$	150,000.00	\$ 2	4,000.00	\$	12,000.00	6 Months	9 Months
Customer										
Eligiblity										
Driver										
Vehicle										
Resource Management	\$	75,000.00	\$	150,000.00	\$	-	\$	-	3 Months	6 Months
Web Based Access										
Provider Assignment API										
Billing and Cost Allocation	\$	25,000.00	\$	50,000.00	\$	-	\$	-	3 Months	6 Months
Total	\$	175,000.00	\$	350,000.00	\$ 2	4,000.00	\$	12,000.00	9 Months	12 Months

Phase 2 – Automated Scheduling and Dispatching

Major functions of phase 2 would include:

- Automated Scheduling and Provider Assignment
- Route Planning and Optimization
- Automated Dispatching
- Electronic Payment

Automated Scheduling and Route Optimization

The most complex problem associated with this application is the scheduling and routing problem. Trips must be automatically assigned to a route/vehicle pair that meets the customer requirements and does not violate system constraints.

The vehicle routing problem (VRP) optimizes vehicle schedules and routes for a fleet of vehicles. A scheduler or dispatcher managing a fleet of vehicles is often required to make decisions about vehicle routing. One such decision involves how to best assign a group of customers to a fleet of vehicles and to sequence and schedule their visits. The objectives in solving such vehicle routing problems (VRP) are to provide a high level of customer service by honoring any time windows while keeping the overall operating and investment costs for each route as low as possible. The constraints are to complete the routes with available resources and within the time limits imposed by driver work shifts, driving speeds, and customer commitments. This service can be used to determine solutions for such complex fleet management tasks. The goal is to come up with an itinerary for each driver (or route) such that the deliveries can be made while honoring all the service requirements and minimizing the total time spent on a route by the driver.

Automated Dispatching

Dispatching is the process of monitoring the performance of service delivery. Dispatchers need easy and fast access to schedule and trip information. The system must provide data views or lists of routes, trips, and related performance data as required. Mapping of routes and trips is also important for the scheduler and dispatcher to graphically view the planned and actual stops and routes for each provider and vehicle. GIS will be used in later versions to support vehicle tracking. Phase 3 will provide automated vehicle tracking and real time mobile data capabilities to provide real time insight into the regional system.

Phase 2 - Implementation	Esti	imate								
					Ann	ual Application	Ann	ual Technical		_
	_ A	pplication Dev	/elo	pment Fees	Hos	ting	Sup	port	Timeframe	
		Low		High					Low	High
Automated Scheduling	\$	500,000.00	\$	750,000.00	\$	6,000.00	\$	48,000.00	12 Months	18 Months
Route Optimization	\$	250,000.00	\$	500,000.00	\$	-	\$	-	6 Months	12 Months
Automated Dispatching	\$	25,000.00	\$	50,000.00	\$	-	\$	-	6 Months	12 Months
Total	\$	775,000.00	\$1	,300,000.00	\$	6,000.00	\$	48,000.00	18 Months	24 Months

Phase 3 – Real Time AVL and Mobile Data Systems

Major functions of phase 3 would include:

- Real Time Asset Tracking and Dispatching
- Real Time Transportation Verification
- Enterprise Transportation Data Analytics
- Customer Mobile App ("Where's My Ride") with Electronic Payment
- Driver Mobile App ("Paperless Manifest and Real Time Data Collection") with Electronic Payment Acceptance

Phase 3 - Implementation	Esti	imate								
					Annu	al Application	Annu	al Technical		
	Α	pplication De	velo	pment Fees	Hosti	ng	Supp	ort	Time	frame
		Low		High					Low	High
Automated Vehicle Location	\$	100,000.00	\$	200,000.00	\$	6,000.00	\$	48,000.00	12 Months	18 Months
Mobile Data System	\$	100,000.00	\$	200,000.00	\$	-	\$	-	6 Months	12 Months
Mobile Apps	Ş	100,000.00	Ş	200,000.00	Ş	6,000.00	Ş	12,000.00	6 Months	12 Months
Customer										
Driver										
Electronic Payment										
Total	\$	300,000.00	\$	600,000.00	\$	12,000.00	\$	60,000.00	6 Months	12 Months

Implementation Cost and Timeline Summary

			Annual Ap	plication	Annual	Technical		
	Application Dev	Hosting Support			Timeframe			
	Low	High					Low	High
GRAND TOTAL	\$ 1,250,000.00	\$ 2,250,000.00	\$	42,000.00	\$	120,000.00	18 Month	24 Month

Summary

	Low	High
Phase 1	\$175,000.00	\$350,000.00
Phase 2	\$775,000.00	\$1,300,000.00
Phase 3	\$300,000.00	\$600,000.00
	\$1,250,000.00	\$2,250,000.00
Budget		
Recommendation	\$1,500,000.00	\$2,750,000.00