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Opportunities for State DOTs (and others) to Encourage Shared-Use Mobility Practices in Rural Areas

FINAL REPORT

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Executive Summary

Shared-use mobility (SUM) practices are transportation services that are shared among users. SUM can include 'traditional SUM' practices such as public transit, taxis, limousines, etc., or 'technology enabled SUM' (will be referred to as 'SUM' in this report) practices such as ridesourcing, carsharing, bikesharing, micortransit services, etc. Advances in electronics, wireless technologies, and mobile applications on smartphones have contributed to the tremendous growth of SUM practices and Americans have embraced these new mobility options which are flexible, convenient, and affordable. Recognizing that technology enabled SUM services are part of the new transportation ecosystem, public transit agencies started partnering with SUM providers to enhance the appeal of public transit rather than diminish it.

While SUM practices exist in all size communities, their presence is much more prominent in urban communities compared to rural communities. While significant mobility gaps exist in rural transit/transportation services due to factors such as lack of funding, low population densities, and long travel distances in rural areas, SUM practices have the potential to fill those mobility gaps by offering fast, on-demand, and reliable transportation options. Many innovative SUM initiatives are being piloted and implemented in rural communities in conjunction with already-existing rural transit/transportation services and with business models tailored for rural communities.

This study investigated various categories of SUM services such as ridesourcing, carsharing, bikesharing, and microtransit service's applicability in rural communities and determined the potential to supplement and/or compliment traditional rural transit/transportation services. This study also focused on the mobility as a service (MaaS) framework for applicability in rural setup. The study of rural SUM implementation in this research effort is drawn from: 1) a comprehensive literature review of SUM initiatives and implementations in rural communities in the United States, 2) interviews conducted with SUM agency contacts and rural community contacts to learn about opportunities and challenges from existing rural SUM implementations, and 3) eight in-depth case studies conducted with relevant rural SUM implementations to understand the planning and implementation aspects. Knowledge gathered and lessons learned from these tasks were used to develop a rural SUM best practices toolkit to inform state DOTs, regional transportation agencies, rural transit agencies, local governments, and other state and local agencies about various steps and tasks involved for strategically implementing SUM strategies such as ridesourcing, carsharing, bikesharing, and microtransit services. Further, guidance is also provided on the role of government, state DOTs, rural transit agencies, transportation planning agencies, and/or state economic. development or small business development agencies to advance the selected SUM strategies in rural settings.

SUM Interviews

Interviews were conducted with SUM operators, existing rural SUM program sponsors, and community stakeholders to better understand the motivations for launching rural SUM solutions, arrangement of any public-private partnerships, opportunities, challenges, and best practices. A total of seven interviews were secured including those with four SUM operators (Uber, Lyft,

MAVEN Carsharing, and Via), and three rural communities (state of Missouri, North Mankato, MN, and Breckenridge, CO) implementing SUM services. While major ridesourcing providers Uber and Lyft have their major markets in larger cities, they have expressed a willingness to work with rural transportation providers or local agencies to supplement or compliment already existing transit/transportation services. However, Lyft has already begun operating in rural communities and recorded a 25 percent service increase for its 150 smallest markets between 2017 and 2018. Unlike Uber and Lyft, that primarily use contracted drivers, ridesourcing service providers such as Feonix Mobility Rising, and RubyRide have used volunteer drivers and employed drivers, respectively, to provide on-demand ridesourcing services in rural communities. While carsharing services are available in a few rural communities with universities, their presence in typical rural communities is non-existent because of a lack of knowledge among service providers about rural markets, a lack of potential use cases, and expensive operational costs. There were no operational microtransit services in rural communities. However, at least one service provider was observed to be available for potential operations.

SUM Case Studies

A total of eight in-depth case studies were conducted to examine rural SUM implementations such as ridesourcing, carsharing, bikesharing, vanpool, and microtransit services. Rural SUM case studies were selected in such a way that they are geographically distributed, addressed unique mobility challenges, and involved diverse supporting agencies/organizations as partners. Table ES.1 provides a summary of case studies conducted for this research effort.

Table ES.1: Summary of Rural SUM Case Studies.

S.No	SUM Program/ SUM Category	Location (Population)	Program Description	Impact
1	Needles Carshare Program/ Carsharing	Needles, CA (Pop: 5,007)	Needles carshare is a rural small-scale carshare program providing a flexible transportation option for carless rural residents.	50 registered members, 70 percent of the program cost covered by utilization revenue generated.
2	Green Raiteros Electric Vehicle Rideshare Program/ Ridesourcing	Huron, CA (Pop: 7,311)	Non-profit rural ridesourcing service featuring electric vehicles provides an affordable transportation option for residents to reach critical services.	Affordable ridesourcing trips to critical services.
3	Michigan Mobility Challenge Grant/ Rural MaaS	Three rural Michigan counties. (Pop: 91,807, 17,573, and 116,447)	Improve demand response and healthcare transportation services in three rural Michigan counties.	25 percent enrollments in new platform, 20 percent reduction in trip cancellations, 10 percent reduction in no-shows, 10 percent increase in rides.

Table ES.1: Summary of Rural SUM Case Studies Continued.

4	Winnebago Catch-A-Ride/ Rural MaaS, and Ridesourcing	Winnebago County, WI (Pop: 284, 778)	Several Winnebago County entities created Winnebago Catch-A-Ride Rural Mobility as a Service program by collaborating with Feonix Mobility Rising and QRyde.	Reduce mobility gaps, and provide available services on-demand.
5	Via Arlington Service/ Microtransit	Arlington, TX (Pop: 396, 394)	The City of Arlington is the first city in the nation to offer on-demand ridesourcing as its sole public transportation solution.	100 percent increase in public transit ridership, 97 percent customer satisfaction rate.
6	Lyft NEMT Services/ Ridesourcing	Multiple communities across the U.S.	Lyft, has created partnerships with non-emergency medical transportation (NEMT) providers to offer convenient and affordable medical-related transportation to those in need.	Reduced wait times, increased on-time performance and cost efficiencies for patients.
7	Allen County Bikeshare Program/ Bikesharing	Allen County, KS (Pop: 12,519)	A bike share program in Kansas offers bike access to rural community residents.	Free bike rentals with the county for residents and visitors.
8	Pennsylvania Vanpool Incentive Program/ Vanpool	Statewide program.	Program provides grant funds to private and public partners throughout the state to subsidize the costs of establishing new commuter vanpool programs.	75 new vanpools created across the state of Pennsylvania.

Rural SUM Toolkit

One of the outputs of the study is a five-task rural SUM toolkit for strategies such as ridesourcing, carsharing, bikesharing, microtransit, as well as rural mobility as a service (MaaS) platforms. The rural SUM toolkit can inform state DOTs, regional transportation agencies, rural transit agencies, local governments, human service agencies, and other state and local agencies about the various steps and tasks involved for strategically planning to pilot and implement relevant SUM strategies to meet the unique transportation needs in rural communities. This toolkit can be applicable for small urban communities as well. A summary of the rural SUM toolkit is presented below:

Task 1: Identify Mobility Gaps, and Determine Service Needs:

Gather Input from Citizens and Community Representatives – Planners gather input about mobility gaps, barriers for transportation, and the efficiency of existing rural transit services and/or other specialized transportation services.

Leadership from Community Partners – Representatives from state/regional/local agencies can form a planning committee/advisory group to follow a strategic planning process to identify and address the transportation challenges. A community champion, along with a lead organization, should be identified in this initial task.

Preliminary Partnerships – Rural communities can form preliminary partnerships with state/regional/local agencies, healthcare organizations, economic/workforce development agencies, local employers, etc., to facilitate strategic planning process for potential SUM service planning and implementation.

Task 2: Determine the SUM Category that Best Suits Rural Community Needs:

Rural communities can address identified mobility challenges by building use cases that they want SUM services providers to address. SUM strategies analyzed that can potentially address rural mobility challenges include:

Ridesourcing Services – have potential to provide on-demand short-distance trips for the elderly, NEMT recipients, veterans, and the general public in rural communities.

Carsharing Services – can meet a specific use case in rural communities by offering access to an automobile for a short period of time to residents without vehicles, low-income individuals, and people with a driver's license looking for independent mobility options.

Bikesharing Services – may be affordable systems to promote active transportation options in rural communities. Systems include bikesharing models such as the low-cost bikesharing system, the library model, and the community bike donations model..

Microtransit Services –did not exist in rural communities as of this writing. However, interest in entering rural markets was expressed by microtransit service providers.

Rural Mobility-as-a-Service – can integrate already existing transportation services along with any existing SUM services onto one platform so target users can access information, make trip reservations, pay for the trip, and receive trip alerts when needed, all at one place.

Task 3: Establish Partnerships

The agency leading the potential rural SUM implementation effort, along with other partners should begin exploring opportunities for partnerships with SUM service providers in the SUM category that best fits the identified use case/cases. Public private partnerships are critical for SUM implementation as: 1) Public partners can help private SUM service providers better understand rural community characteristics, travel markets, existing complementary services, and identified challenges and use cases for SUM operators to address. 2) Private SUM service providers are important for rural SUM implementation as they provide technology, software, and mobility platform to address rural mobility challenges.

Task 4: Evaluate Challenges, Accessibility, and Impacts

While public/ private partners plan for specifics of SUM implementation, some potential challenges to be aware of and needs to be addressed include: limited funding availability for piloting and/or implementing unconventional SUM strategies, potential low demand in rural communities, need to gain trust of rural riders (especially for ridesourcing services, and its drivers), availability of adequate broadband coverage for SUM operations feasibility, accommodating riders with wheelchair access, and accommodating riders who do not have access to smartphone or do not have a bank account. Public/private partners should also identify impacts for potential rural SUM service operations; identifying impacts can help set goals for SUM operations as well as help secure funding.

Task 5: Funding and Implementation

Availability of funds/grants is essential for piloting/implementing rural SUM services, as well as subsidizing SUM trips/services to provide affordable mobility options for rural market. Unlike transit services, most SUM services are capital-light business models, and benefit more from assistance for operational expenses. Some funding opportunities for rural SUM services include: FTA formula funding (section 5310 & 5311), mobility on demand (MOD) grants, state DOT funding, community initiatives, and other national, state, and local grants.

Implementation of rural SUM starts with a 6- to 12-month time frame for contract setup process, followed by a 6- to 12-month pilot phase to test the implementation plan. Based on availability of a sustainable funding source, relevant modifications can be made to address any challenges faced in the pilot phase to continue operations.

Guidance for State DOTs and Other Agencies to Promote SUM services Practices in Rural Areas

To facilitate the implementation of technology-enabled SUM practices for providing on-demand, reliable service with broader coverage, state DOTs and other agencies can use the following strategies: 1) diversify state DOT funding between traditional and SUM services, 2) allow eligibility to use FTA formula grants (Section 5310 &5311), FTA's MOD grants, and state DOT transit funding for rural SUM practices, 3) create a one-stop learning platform about rural transportation challenges and SUM opportunities to help SUM providers understand rural markets as well as create awareness for public agencies about cost-effective and innovative SUM practices, 4) ensure availability of broadband internet service in rural areas, 5) advocate for the significance of transportation for healthcare and employment in rural communities, and 6) explore potential initiatives and funding opportunities from regional transportation agencies.

Chapter 1: Background and Introduction

The term "shared mobility" is defined by Society of Automotive Engineers (SAE) as "the shared use of a vehicle, motorcycle, scooter, bicycle, or other travel mode; it provides users with short-term access to a travel mode on an as-needed basis" (*1*). Shared mobility (which is referred to as shared-use mobility (SUM) in this report) may include public transit; taxis and limousines; ridesourcing, carsharing, bikesharing, and ridesharing programs; microtransit services; scooter-sharing; shuttle services; and neighborhood shuttles.

Until recently, public transit service was the only SUM enterprise in most communities. However, with advances in electronic and wireless technologies and mobile applications on smart phones, technology-enabled SUM practices (such as ridesourcing, carsharing, bikesharing, microtransit, etc.,) have grown tremendously. Americans have embraced this new set of convenient and affordable mobility solutions that have transformed the transportation landscape in places large and small. In many cases, the 'technology-enabled SUM' (will be referred to as 'SUM' from now on in the report) services have benefitted from broad societal trends related to a renewed interest in urbanism, environmental conservation, and the emergence of the so-called "gig economy."

In a Transit Cooperative Research Program (TCRP) (Report 188) study, the Shared-Use Mobility Center (SUMC) conducted interviews with transportation officials and surveyed more than 4,500 shared mobility users in seven large cities in the United States and found that while SUM practices have rapidly increased in recent years, rail and bus transit services remain the most commonly used shared modes of transportation, followed by bikesharing, carsharing, and ridesourcing (*2*). Although ridesourcing companies such as Uber and Lyft (known as transportation network companies [TNCs]) have received the most attention, there are a range of SUM practices that provide a growing number of mobility options. The study further found that SUM practices largely complement public transit, therefore enhancing urban mobility (*2*). Emerging mobility providers can sometimes help transit agencies by providing services to hard-to-serve areas, and allowing transit to focus its resources on higher-ridership routes (*3*). While traditional public transit services and other specialized transportation services receive federal, state, and local funds for capital needs, most SUM services are capital-light and operational-heavy business models.

SUM services are constantly being improved and enhanced to provide efficient and economical shared-use transportation services to their users. For example, TNCs have been very successful in providing real-time, on-demand trip services. Recently, Uber and Lyft added ridesplitting services UberPOOL and Lyft Line, respectively, that allow drivers already carrying a passenger to add additional passengers whose destination might share a common route. Carsharing and bikesharing services have begun partnering with a number of transit agencies to use SUM services to better address first mile/last mile gaps in a city's transit network (*2*). Many public transit agencies are developing online tools and mobile applications to incorporate multiple SUM services, allowing users to plan a trip with more than one SUM service and use a single form of payment for the entire trip. Public transit agencies also have recognized that ridesourcing

companies and other SUM services are a part of the new transportation ecosystem, and that partnering with them holds the potential to enhance the appeal of public transit rather than diminish it.

Shared-Use Mobility Practices Defined

The terminology for various SUM services are used in different ways at various sources. In this report, SUM service terminology and definitions are primarily taken from SAE International's taxonomy document (*1*). SUM service categories primarily studied in this research effort are ridesourcing, carsharing, bikesharing, and microtransit services. However, other SUM services such as ridesharing are also included in parts of the report based on relevance. Definitions for various SUM categories are presented below, with more detailed descriptions provided in Section 2. Apart from SUM service categories considered in the study for rural implementations, rural Mobility-as-a-Service platform's implementation and applicability will also be investigated in the research effort.

Ridesourcing: "Ridesourcing services are prearranged and on-demand transportation services for compensation in which drivers and passengers connect via digital applications. Digital applications are typically used for booking, electronic payment, and ratings."

Ridesplitting: "A type of ridesourcing which is also referred to as dynamic carpooling that allow customers requesting a ride for one or two passengers to be paired in real time with others traveling along a similar route (*4*)."

Ridesharing: "Ridesharing (also known as carpooling and vanpooling) is defined as the formal or informal sharing of rides between drivers and passengers with similar origin-destination pairings. Ridesharing includes vanpooling, which consists of 7 to 15 passengers who share the cost of a van and operating expenses, and may share driving responsibility."

Carsharing: "Carsharing offers members access to vehicles by joining an organization that provides and maintains a fleet of cars and/or light trucks. These vehicles may be located within neighborhoods, public transit stations, employment centers, universities, etc. The Carsharing organization typically provides insurance, gasoline, parking, and maintenance. Members who join a Carsharing organization typically pay a fee each time they use a vehicle."

Bikesharing: "Bikesharing provides users with on-demand access to bicycles at a variety of pick-up and drop-off locations for one-way (point-to-point) or roundtrip travel. Bikesharing fleets are commonly deployed in a network within a metropolitan region, city, neighborhood, employer center, and/or university."

Microtransit: "Microtransit is defined as a privately or publicly operated, technology-enabled transit service that typically uses multi-passenger/pooled shuttles or vans to provide on-demand or fixed-schedule services with either dynamic or fixed routing."

Mobiltiy-as-a-Service: "Mobility as a Service (MaaS) [sometimes also called as Transportation as a Service (TaaS)] is the integration of various forms of transport services into a single mobility service accessible on demand. To meet a customer's request, a MaaS operator facilitates a diverse menu of transport options, be they public transport, ride-, car- or bike-sharing, taxi or

car rental/lease, or a combination thereof. For the user, MaaS can offer added value through use of a single application to provide access to mobility, with a single payment channel instead of multiple ticketing and payment operations. For its users, MaaS should be the best value proposition, by helping them meet their mobility needs and solve the inconvenient parts of individual journeys as well as the entire system of mobility services (*5*)."

Rural and Small Urban Areas Defined

In this study, the research team defines rural communities as those having populations of less than 50,000, and small urban communities as those with a population of more than 50,000, but less than 200,000. This definition was established by the US Census Bureau and is used by FTA to distinguish rural from small and large urbanized areas in the administration of its formula programs.

Shared-Use Mobility Toolkit for Cities

In 2016, the Urban Sustainability Directors Network (USDN) partnered with SUMC to create the Shared Mobility Toolkit (referred to as the SUMC toolkit) as a resource for cities to better understand the emerging opportunities and challenges related to SUM (*6*).

The SUMC toolkit can be used by cities, transit agencies, and other mobility stakeholders to understand emerging transportation solutions' impacts on their communities, and set goals to maximize shared mobility benefits. The SUMC toolkit is divided into the following four parts:

1. An interactive shared mobility mapping tool that can be used to identify the shared use vehicle locations and service areas from all providers in 50 North American cities
2. An opportunity analysis tool which helps identify transportation gaps so that cities can understand where greater service is needed and what shared modes could support the gap
3. A shared mobility policy database which include policies, studies, and strategic plans for more than 600 practices as well as best practices and case study documentation to SUM practices
4. An interactive SUM benefits calculator for toolkit users to quickly access the potential benefits (*6*)

This toolkit was primarily aimed towards urban areas and included content drawn from more than 50 North American cities and metropolitan regions, including 27 USDN study cities. While most of the North American cities considered were large cities, the 27 USDN cities were categorized as small (<200,000 residents), medium (200,000-1,000,000 residents), and large (>1,000,000 residents). Seven of these 27 USDN cities were small cities with populations of less than 200,000 (*6*).

SUM Practices in Rural Communities

Even with the rapid evolution of many new SUM practices, conventional SUM practices such as ADA paratransit services, demand-response transit services, specialized transportation services (such as volunteer driver programs, non-emergency medical transportation (NEMT) services, veteran's transportation services, and other human service transportation services) and sometimes fixed-route public transit services are still prominent and highly relied upon in rural

communities. These conventional services provide lifelines to their users, connecting them to healthcare providers, employment opportunities, educational institutions, and social activities.

Robust, viable public transit service is often challenging in rural areas because of low population densities and long distances. Consequently, there are significant gaps in rural transit service that have the potential to be addressed through emerging, technology-enabled SUM practices that offer fast, flexible, convenient, and reliable mobility options. However, the implementation of emerging SUM practices in typical rural areas by already-established SUM agencies (Uber, Lyft, Zipcar, Car2Go, Chariot, etc.) is minimal compared to urban areas.

While most emerging SUM practices are not available in typical rural areas, innovative SUM initiatives and pilot projects are being experimented with in conjunction with already-existing rural transit/transportation services and with business models tailored for rural communities. Lessons learned from public partnerships in larger urban settings and from initial rural SUM implementations could be instructive for rural transit agencies (and state departments of transportation [DOTs]) wanting to establish new partnerships with ridesourcing companies and other SUM service providers to augment transit services in rural areas. It is also important to study and document how state DOTs can ensure public-private partnerships with ridesourcing agencies and other SUM agencies to ensure Americans with Disabilities (ADA) compliance and service accessibility for seniors, low-income individuals, and persons with disabilities, particularly when SUM practices are used to supplement ADA paratransit services. There is a great need to identify and analyze various emerging SUM practices being tested in rural communities across the country to determine if they can supplement and/or compliment traditional rural transit services.

Study Objectives

This "Opportunities for State DOTs (and others) to Encourage Shared-Use Mobility Practices in Rural Areas" research was directed by the NCHRP 20-65 panel (Research for the AASHTO Standing Committee on Public Transportation) to review various rural SUM implementations and develop a framework for their successful implementation in other non-urban and small urban environments.

The objectives of this research effort include:

1. Review and compile emerging SUM practices and programs primarily from US rural settings, and in small urban settings when applicable; determine applicability of various SUM practices to rural settings; and review mobility initiatives from state DOTs, the FTA, and other federal programs that promote emerging SUM practices in urban/small urban/rural areas and determine their applicability to rural settings.
2. Conduct SUM interviews with SUM agency contacts and rural community contacts with regard to initial rural SUM implementations to learn about opportunities and challenges for various SUM practices in rural communities.
3. Conduct in-depth case studies of a few of the most relevant rural SUM implementations to learn about planning and implementation aspects of rural SUM implementations.

4. Develop a rural SUM best practices toolkit that can help rural communities become informed about tasks involved for strategically planning and implementing various SUM services, and provide detailed guidance on the role that government, rural transit agencies, transportation planning agencies, and/or state economic development or small business development agencies will need to play to advance the selected category of SUM services in rural communities.
5. Convene a rural transit/transportation focus group to validate and update the rural SUM toolkit and guidance documents developed.

Organization of this Report

This report is compilation of research for NCHRP Project 20-65, Task 76. The report is organized as follows:

Chapter 2: Review of SUM Practices in Rural Areas – presents an overview of SUM service categories – ridesourcing, carsharing, bikesharing, and microtransit services in rural areas.

Chapter 3: Mobility Initiatives from State DOTs, FTA, and Other Federal Programs that Promote Emerging SUM Practices – presents a summary of four different state/federal initiatives that promote SUM practices in rural communities.

Chapter 4: Rural SUM Interviews – presents a summary of interviews conducted with SUM providers and rural community contacts about rural SUM implementations.

Chapter 5: Rural SUM Case Studies – presents eight in-depth case studies of rural/small-urban SUM implementations detailing planning and implementation specifics for various SUM services.

Chapter 6: Rural SUM Toolkit – presents a rural SUM “best practice” toolkit that can inform state DOTs and other agencies of the steps and tasks involved to strategically implement technology enabled SUM services in rural communities.

Chapter 7: Guidance for State DOTs and Other Agencies to Promote SUM Practices in Rural Areas – presents guidance on the role that government, state DOTs, rural transit agencies, transportation planning agencies, and/or state economic development or small business development agencies will need to play to advance SUM practices in rural settings.

Chapter 2: Review of SUM Practices in Rural Areas

This chapter summarizes the review of emerging SUM practices and initiatives in rural areas in the United States. SUM practices are summarized by various selected categories such as ridesourcing services, carsharing services, bikesharing services, and microtransit services.

Ridesourcing Services

Ridesourcing companies (known as transportation network companies, or TNCs) have expanded rapidly to numerous cities in the United States and around the world. Uber provides ridesourcing services in more than 320 cities, and Lyft provides ridesourcing services to more than 630 cities in the United States. Annual TNC ridership increased by 37 percent from 2016 to 2017 to 2.61 billion trips, and –together with taxicabs – the for-hire market sector was projected to surpass local bus ridership by the end of 2018 (*7*). However, TNCs draw the vast majority of their riders from urban areas. In fact, 70 percent of TNC ridership comes from only nine metropolitan areas in the United States (*7*).

While both Uber and Lyft primarily provide ridesourcing services to larger urban areas and small urban areas, they have started operations in a very few rural US communities. Lyft specifically announced in 2017 that it offers its services to 40 US states including rural areas (*8*). Hoping to establish a business model for ridesourcing services in rural areas, Liberty Mobility Now launched in several Midwest states in 2016 and 2017, with an emphasis on providing service to seniors. Its financial model was dependent on many sources such as users, grants, and contracts with insurance companies, hospitals, cities, and state agencies. Liberty provided rides using independently contracted drivers who used their own vehicles in seven states—Nebraska, Virginia, Ohio, Missouri, Texas, South Dakota and Colorado. Rides were $1 a mile with a minimum fare of $5.10 plus a $1.10 booking fee. There was no charge for additional passengers, and rides could either be booked immediately or up to five days in advance. If a user did not have access to a smartphone, they could call a landline to book the ride. However, early in 2018, Liberty Mobility ceased operations and filed for bankruptcy, citing a lack of resources and time to prove the feasibility of the model (*9*). Feonix Mobility Rising is another ridesourcing provider that primarily focuses on using state-of-the-art technologies to solve mobility challenges for vulnerable communities including rural populations. Most of its initial implementations used volunteer drivers on a ridesourcing platform to provide on-demand trips in rural communities.

TNC giants Uber and Lyft, operating as Uber Health and Lyft Concierge, have entered into non-emergency medical transportation (NEMT) to help patients visit healthcare providers by making their NEMT trips affordable and convenient. Further, they have also started providing wheelchair accessible (WAV) on-demand services for riders with accessibility requirements. While WAV services existed in a few urban communities, their presence in rural communities is minimal.

Ridesourcing demand characteristics for rural areas are very different when compared to urban areas. Generally, ridesourcing services operate sustainably in communities characterized by shorter trip distances within a small geographic area; this arrangement assured the ridesourcing driver a good chance of securing a return trip (*10*). In rural areas, depending on the community

characteristics, ridesourcing trips may be very short, which may not help secure enough driver revenue per trip, or the trips may be very long, in which case the trip can be expensive for riders, and could diminish the chances of securing a return trip for a potential ridesourcing driver. A study conducted for the rural disadvantaged communities of California's San Joaquin Valley applied the City of Fresno's current Uber fare structure for potential ridesourcing services in their rural disadvantaged communities and found that median driver revenue per ridesourcing trip would be negative (-$12.30) (*10*). Negative fare revenue to drivers showed that the current ridesourcing fare structure could not be applied to its rural operations, and therefore the study has developed a high ridesourcing fare structure that could potentially let the drivers in rural communities earn positive revenue. The current Uber fare structure for the City of Fresno includes one-way trip time cost (10 cents per minute), and distance cost (80 cents per mile), along with a minimum fare and other fees. The high ridesourcing fare structure instead incorporates full round-trip time cost (8 cents per minute) and distance cost (54 cents per mile). This fare structure has increased the median hourly revenue for ridesourcing drivers to $6.20 per trip. Further, cost reductions of $19 to $27 per trip was estimated if current transit is replaced by ridesourcing services with the high fare structure (*10*).

While ride-splitting services are popular in select bigger cities, it may be challenging to apply these services in rural communities, considering the low spatial and temporal demand. However, ride-splitting service may be facilitated for rural communities by incorporating a "book ahead" feature that could be available from some ridesourcing companies (*10*). Because ridesourcing services (and other emerging SUM practices) typically rely on the use of smartphones linked with credit or debit cards, lower income individuals, individuals with limited English proficiency, individuals who do not own a smartphone, or individuals who do not have a bank account or a credit card could not use these services. A Transportation Research Board study (*11*) examined public transit in the context of emerging technology-enabled SUM services and provided recommendations to policymakers and regulators about the need for accessibility for all users. These recommendations address the potential disparity between access for people with various disabilities and other travelers as new SUM services expand. While the collaborations and partnerships between technology-enabled SUM agencies and public transit agencies are initially geared towards achieving shared goals, they are not highly formalized or structured and can lead to potential regulatory and legal concerns (*2*). Most importantly, while government contracts and public transportation agencies' partnerships with private SUM services can effectively supplement public transit services, they can present challenges for complying with ADA and other federal regulations if partnering SUM agencies cannot properly accommodate and provide equal services for disabled riders (including those with wheelchairs), seniors, and low-income individuals. While some SUM agencies are working toward improving accessibility of their services to various demographic populations, additional research is underway on this issue to better formulate public-private partnerships to address the identified concerns and challenges, as well as determine the impact of accessibility of SUM services to the transportation disadvantaged. The following presents summary findings from recent research on public-private partnerships with TNCs.

Partnerships Between Transit Agencies and Transportation Network Companies (TNCs):

A recent TCRP study (J-11/Task 26) produced practical guidance for making informed decisions on where, when, and how partnerships between transit agencies and transportation network companies (TNCs) can be considered (*12*). The study compiled all known transit agency/TNC partnerships and conducted surveys and follow-up interviews with transit agency representatives about the transit agency/TNC partnership experience. The study also included interviews with TNC policy staff, industry experts, and FTA representatives. Based on the responses to the surveys and follow-up interviews, 20 transit agency/TNC partnerships were considered for in-depth case studies. All of these agencies are in larger urban areas. Case studies focused on understanding various aspects of the program such as partnership relationship initiation goals, anticipated outcomes, category of partnership formed (formal vs. informal), regulatory considerations, operational characteristics, program evaluation, and lessons learned.

Motivations for partnerships between transit agencies and TNCs included: demonstrating innovation; using TNCs to provide specific services to increase mobility, improve cost efficiency, etc. without the need to make major capital investments; and meeting specific policy goals or challenges. Target markets for TNC partnership services included first mile/last mile connections for transit service, ADA paratransit customers, people from lower density environments, late-night trips, and guaranteed ride home participants. Most of the partnerships involved transit agencies subsidizing TNC trips. While partnership designs involved formal (money exchange involved) and informal arrangements, formal partnerships involved transit agencies initiating a procurement process by issuing a request for proposal (RFP) or request for information (RFI). These formal partnerships had better opportunities for TNC partners to share data (although sufficient data sharing is still identified as a significant issue). While TNCs were able to provide on-demand flexible trips through these partnerships, similar service with equivalent response times for wheelchair-accessible vehicles is identified as a hurdle, and partnerships mostly engaged a third-party wheelchair-accessible provider along with a TNC partner. Synthesizing all the findings from transit agency/TNC partnerships, researchers generated a Partnership Playbook to guide transit industry personnel while working in partnerships with TNCs (*12*).

Schwieterman, et. al. (2018) conducted a similar study to review the past and present partnerships between TNCs and public agencies in the United States. Figure 2.1 provides a summary of partnerships, program highlights, and their current status. The status of 29 partnerships designed to improve mobility were studied; 22 of them were reported as still active.

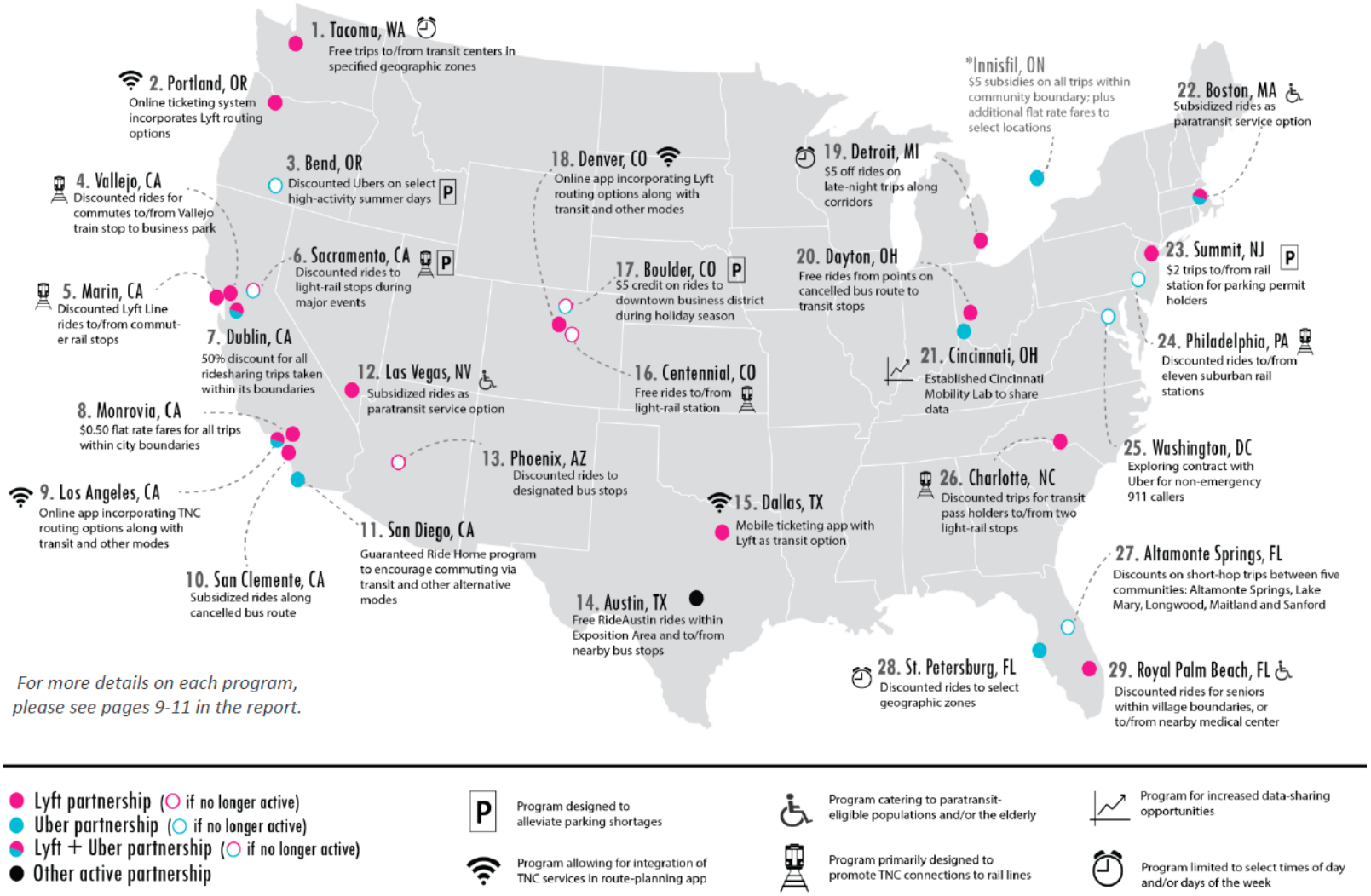

Figure 2.1: Past and Present Partnerships Between TNCs and Public Agencies in the US.

Source: Schwieterman, Livingston, & Slot, 2018 (*13).*

While there were very few partnerships in 2015, there were more than two dozen by early 2018. However, Schwieterman, et. al found that only a few of the nation's larger transit agencies have participated in collaborative arrangements with TNCs. The partnerships evaluated in the research effort were categorized under various types of partnerships/programs. These categories and the number of programs under each category included: 1) connecting riders to transit service using incentivized ridesourcing services, categorized using various criteria (18 programs); 2) developing smart phone applications for trip planning that combine ridesourcing and transit in the same trip (4 programs); 3) mitigating parking shortages or forestalling the need for parking lot investments (3 programs); 4) providing alternatives to conventional paratransit services that promote mobility of impaired riders, elderly, and disabled (2 programs); and 5) providing specialty programs that indirectly promote transit use and transit service development (3 programs).

The study further predicts four likely trends with regard to public agency and TNC partnerships in the future: 1) additional large transit agencies will likely try collaborations with TNCs; 2) before development of any new partnerships, a more formal evaluation of current partnerships/programs is much needed; 3) more cities will explore improving paratransit services with ridesourcing partnerships; and 4) future partnerships have the potential to integrate fares for trips involving transit/TNC connections (*13*).

Carsharing Services

While carsharing has been around since the 1940s, it has gained much popularity in the past decade with the availability of smartphones (*14*). Strong growth of carsharing services has been seen mostly in large urban areas. Carsharing services provides users with access to an automobile for a short period of time. Various carsharing services might offer round-trip carsharing, one-way or point-to-point carsharing, peer-to-peer carsharing, and niche carsharing services (*15*). Companies providing carsharing service include Zipcar, Car2go, Enterprise Carshare, Maven, etc., Research shows that carsharing users drive less and are less likely to own personal vehicles (*16, 17, 18*). While private agencies such as Zipcar, and Car2go were the largest carsharing companies in the world, the public sector facilitates carsharing programs by encouraging deployments and by leasing parking spaces for the vehicles (*11*).

While not many rural communities offer carsharing services, a few rural communities do operate some sort of carsharing services which could include Zipcar, and peer-to-peer carsharing. These programs will be the subject of further analysis in subsequest sections of this research that describe interviews and case studies of some of the unique rural Carsharing implementations.

Bikesharing Services

Bikeshare programs have gained much popularity in the last decade in the United States, as well as internationally. Many cities have implemented bikeshare programs because of their numerous benefits such as access to a low-cost public transportation, health benefits from increased physical activity, improved connectivity, flexible mobility, emission reductions, reduced fuel use, support for multimodal connections, and reduction of congestion on roadways (*19, 20*).

According to studies conducted with more extensive bikeshare systems in larger urban areas, bikeshare programs can both substitute for and complement public transit services, depending on population density and other factors. Further, dockless bikesharing has become much more prominent recently in larger urban areas. Large TNCs have also entered the bikesharing industry by collaborating with bikeshare providers. Uber recently acquired the JUMP bikesharing start-up to expand its ridesourcing service and enter the dockless mobility market. JUMP is best known for operating dockless, pedal-assist bikes. Similarly, Lyft recently acquired the Motivate bikeshare company, which is the country's most ridden bikeshare system with a presence in larger cities such as New York (Citi Bike), San Francisco Bay area (Ford GoBike), Chicago (Divvy), Boston Metro area (Bluebikes), the Washington, D.C. metro area (Capital Bikeshare,) Portland (BIKETOWN), Columbus, Ohio (CoGo), and Minneapolis (Nice Ride) (*21*).

While docked bikesharing systems have been sustained for many years in large cities, their cost is likely out of reach for rural communities. Including stations and support staff, each bikeshare system bike can cost between $3,000 and $5,000. (*22, 23*). Therefore, many rural communities have been experimenting with low-cost bikeshare models (discussed in the following section) which are efficient, scalable, practical for low-income rural residents, and best suited to rural communities. Other bikeshare models (also discussed in the following sections) include the bike library model and community bike donation initiatives.

Low-Cost Bikesharing Systems

While most successful bikeshare business models such as those in New York and Washington, D.C., need high startup investments and capital budgets to establish the system, high levels of ridership are also needed to pay for the system and earn a profit. Sufficient levels of ridership are usually only possible in urban areas with high bicycling demand. However, low-cost bikeshare systems could potentially cater to demand in rural communities with lower budgets. For example, an economical bikeshare system is currently operated in College Park, MD, (population: 32,303) by Zagster (*24*). Zagster is known for operating affordable bikeshare services for smaller markets and communities. Characteristics of this bikeshare system include offering bikeshare as a service where the company owns the bikes and is responsible for their maintenance, rather than the public-sector partner. Further, the bikes, bike racks, and other needed infrastructure are built to a modest quality to make the program more economical and attractive to smaller markets (*24*). While Zagster operates 100 programs in 35 states, most of these operations are in smaller markets or smaller communities. Social Bikes is another bikesharing company that provides affordable and flexible bikesharing programs for small communities. Some of the rural communities operating bikesharing services through Social Bikes include Ketchum, ID, (population: 2,763) Pullman, WA, (population: 33,354) Huntington, WV, (population: 47,079) and Magnolia, AR, (population: 11,467).

Other rural communities have developed their own creative and affordable bikeshare programs. In Indiana, for example, the cities of Aurora (population: 3,703) and Lawrenceburg (population: 5,034) created a bikeshare system called "River Cities Bike Share Program" for its residents and visitors (*25*). Bike rentals are $3 for the first hour and $2 for each additional hour. The system had 30 bikes across three locations in its first year of operations and generated 1,300 rides in its

first eight weeks, proving the potential of a low-cost system in a rural community (*25*). In Stillwater, OK, (population: 49,829) a bikeshare system called OrangeRide was established that could be useful for both community residents and Oklahoma State University (OSU) students, and at the same time could expand the service area for the area transit system to solve the first mile/last mile problem. Montevallo, AL, (population: 6,636) developed a low-cost bikeshare system called ValloCycle which includes bikes ranging from traditional cruiser bicycles for the general public to hand-operated bikes for individuals with disabilities. Payment for this bikeshare service can be made by using one of the following options: 1) $25 annual fee; 2) $10 annual fee for individuals under 17; or 3) 25 hours of community service (*25*). Aspen, CO, (population: 7,359) famous for its high-end ski resorts, launched a bikeshare system, WE-cycle, in 2013 to operate in conjunction with Roaring Fork Transportation Authority's new VelociRFTA bus rapid transit (BRT) system (*26*). VelociRFTA BRT is a 38-mile route between Glenwood Springs, Aspen and the communities in between. VelociRFTA BRT brings riders to Aspen, CO, and riders seek last-mile connections while they are there. The demand for these last-mile connections were served by WE-cycle service with 100 bikes at 16 locations. The overlap of WE-cycle with VelociRFTA increased VelociRFTA's ridership, as well as increased WE-cycle's usage by 76 percent in its second year of operation compared to its debut year (*26*). Various low-cost and diverse bikesharing systems show potential opportunities for rural communities to implement bikesharing service using an affordable model, or when applicable, in collaboration with local transit agencies, educational institutions, or other agencies with common interests.

Library Model

An innovative rural bikeshare model that gained national attention is the "library model" developed by Allen County, KS, (population: 12,519) (Figure 2.2). While Allen County already had the built environment to facilitate bicycling, a barrier to bicycling identified by community members was lack of access to bicycles themselves (*27, 28*). The program, called Allen County Bike Share, received financial support through a grant from Blue Cross Blue Shield of Kansas (*28*). This program allows the public to check out bicycles for free for different periods of time ranging from minutes to months. The program has 40 bicycles and 2 tricycles distributed among seven locations. With free rental, the program is aimed to meet the needs of residents as well as the low-income population who may or may not have access to smartphones and/or credit cards. To check out a bike, the patron must simply provide a picture ID and sign a waiver form. With very minimal publicity, ridership reached 100 checkouts in the first three months, and plans are underway to expand the system to multiple locations as funding permits (*27, 28*). Leaders in Allen County hope this model could benefit other rural communities in Kansas and beyond (*27*).

Figure 2.2: Allen County Bike Share Station with Single-Speed Cruiser Bikes.

Source: Thrive Allen County, 2017 (*27*).

A similar example was implemented in Mansfield, OH, (population: 46,160) where the community's library (Mansfield/Richland County Library) built a bikeshare service in October 2017 when approached by the Richland Public Health Department about ways to use the library as a public health resource. A grant from the Department was used to purchase the needed equipment, and assistance from local bike shops was used for purchasing bikes and setting up the system. Just like checking out a book or movie from the library, a bike can be checked out for free using a library card. Checked out bikes come with a helmet and patrons need to return the bike by the end of the day to avoid overnight security issues.

In Ohio, the library model of bikeshare has been implemented by libraries in a number of other rural communities such as Athens, Glouster, The Plains, Nelsonville, and Chauncey. These programs have each demonstrated great success with bicycles reported as the most circulated item in the libraries (*25*). Overall, more than a dozen communities across the United States have bikes available for checkout at their local libraries (*29*). The library model demonstrates how existing institutions/community resources in small towns and rural areas could be used to facilitate a bikeshare system that benefits the health and well-being of the community, as well as provide improved mobility options to residents and low-income individuals. Support for this model from grants and public-private partnerships could help establish and maintain the services.

Community Bike Donations Initiative

In Wisconsin Rapids, WI, (population: 17,806) a bikeshare system was created by a community coalition. The program was launched in Fall 2014 and called "River Riders Bike Share" (Figure

2.3). The program received 65 donated bicycles that are available for free checkout at four locations in the community (*30*). Wisconsin Rapids already has many bike paths and routes, and this community-driven bikeshare effort could potentially help residents and visitors who don't have bikes to get around. The community coalition made the program possible by gathering a group of partners who were motivated to provide residents with access to healthy transportation choices. Partners were informed about potential ways a bikeshare program can improve their personal or professional interests (*30*). From 2014 to 2017, the River Riders Bike Share program tracked 700 rides and learned about challenges facing the program such as maintenance, tracking, and quality and type of bicycles in the system (*31*). River Riders Bike Share eventually received funding to bring a robust bikeshare system to town, and collaborated with national bikesharing company Zagster to provide a brand new look to its program. Through Zagster, 30 cruiser-style bicycles were deployed, starting April 2018, at six different stations. An additional six accessible bikes, including tricycles, hand cycles, and side-by-side tandem bikes (*31*), will be added later.

Figure 2.3: Community Coalition Bike Share Program Through Donated Bikes.

Source: River Rides Bike Share (*32*).

A similar bikesharing system was established in Norway, ME, (population: 4,955) in April 2015 (*33*). Bikes for this program were donated by area residents and the police department which donated unclaimed stolen bikes. Volunteers repaired the donated bikes as needed. Small grants were received from local organizations to help with parts, bike racks, and helmets. The Bicycle Coalition of Maine's Community Spokes program helped with liability paperwork. Bikes were available for checkout initially from already-existing bike racks, with plans to add additional stations throughout the area. Bike rentals were free and limited to a couple of hours so as not to conflict with business at local bike shops. Following Norway's model, Machias, ME, (population: 2,102) installed 30 bike racks through a grant received from Healthy Maine Streets. Residents of Machias donated bikes to be unlocked and available at these 30 bike racks for free to any interested rider (*33*).

These rural, community-driven programs demonstrate that bikeshare systems can be successfully implemented at a relatively low cost if the community is motivated and receives support from local organizations and partners.

Microtransit Services

Microtransit service initially originated to serve the employees of California's Silicon Valley technology companies by filling the gaps in the region's existing transit network (*34*). Later, private-sector firms such as Leap Transit, Chariot, and Bridj adapted this service to provide a technology-enabled, on-demand transit model to consumers in communities who are willing to pay a higher fare for their commute. When compared to fares for transit trips, microtransit service fares are expensive, but microtransit is often much cheaper than a taxi ride. While some studies suggest microtransit service is unsustainable for a minimum wage earner, providing on-demand and shared services facilitated through technology has been successful in some larger communities. Eventually, microtransit service providers such as Bridj and Chariot, which primarily operated on-demand fixed/flexible routes, have either ceased operations or faced problems in the United States. However, Via Transportation, Inc., which uses a dynamic on-demand platform for providing microtransit services has seen success both in bigger and smaller cities.

A study conducted by the Eno Transportation Center investigated three different initiatives where public transit agencies collaborated and implemented some of the first microtransit pilots in the United States: 1) Kansas City Area Transportation Authority (KCATA) and Bridj; 2) Santa Clara Valley Transportation Authority (VTA) and RideCell; and 3) Alameda-Contra Costa (AC) Transit District and DemandTrans. Some of the lessons learned that could be applied to future public operations of flexible-route, on-demand microtransit are: 1) agencies willing to test microtransit need to prioritize customers' needs and the technology-enabled services should put the customers first; 2) agencies should utilize experienced microtransit contracting agencies to deploy microtransit services; 3) success and failure should be determined based on performance metrics such as improved mobility, increased safety, and enhanced customer experience; and 4) agencies should establish their goals up-front and work with potential technology vendors to design a microtransit project within these parameters (*35*).

While microtransit services are popular and have been experimented with in various collaborations in larger urban areas, their applicability and usefulness in rural areas is unknown as these services have not been implemented even in medium-sized cities (*34*). This research effort will explore microtransit implementation in smaller communities to understand their feasibility and potential for implementation.

Chapter 3: Mobility Initiatives from State DOTs, Federal Transit Administration (FTA), and Federal Programs that Promote Emerging SUM Practices

This section summarizes four initiatives which include some promotion of emerging SUM practices in rural, small urban, and urban areas, as well as a Mobility-as-a-Service (MaaS) framework in the context of rural communities. The first of these are the innovative transportation models and partnerships that state agencies are making with transportation network companies (TNC) to supplement Medicaid's non-emergency medical transportation (NEMT) benefit. The second is the Federal Transit Administration's (FTA) Mobility on Demand (MOD) Sandbox initiative that demonstrates several emerging technologies and innovative methods to provide improved mobility options, including SUM. A third unique and innovative transportation services initiative profiled in this document is demonstration of a rural MaaS framework for the Veterans Transportation and Community Living Initiative (VTCLI). The fourth initiative is a Michigan DOT initiative to promote new technologies and innovative service models in urban, suburban, and rural communities across the state.

Lessons learned from these federal and state programs and initiatives could be useful for promoting, incentivizing, and expanding selected categories of SUM services in rural and small urban areas. These innovative efforts and partnerships may provide on-demand improved mobility options to rural residents or specific transportation-disadvantaged individuals such as veterans, seniors, individuals with disabilities, and other travel markets found in rural areas.

TNCs Supplementing Medicaid's NEMT

Reliable access to transportation services is critical for transportation disadvantaged individuals with chronic health conditions. Lack of transportation services may force these individuals to forgo or delay healthcare trips, resulting in poorly-managed healthcare conditions, and future need for emergency services. Among Medicaid beneficiaries, a primary barrier to receiving health care services has been observed to be a lack of reliable transportation (*36, 37*). Medicaid's non-emergency medical transportation (NEMT) benefit helps such individuals lacking reliable and affordable transportation with appropriate transportation services. To provide transportation through the NEMT benefit, states purchase hundreds of millions of rides from taxis, vans, ambulettes, and public transit each year (*38*). According to the US Department of Health and Human Services (DHHS), at least $1.3 billion was spent on NEMT in 2012.

Each state has flexibility in implementing the NEMT benefit and has created their own service structure (*38*). Some structures include transportation brokers, managed care benefits, fee for service, and public transit. While NEMT services may adequately meet beneficiaries' needs for transportation, they often fall short in addressing time-sensitive needs. Further, some of the challenges that states face in administering the benefits include customer service concerns, limited capacity to respond to unplanned transportation needs, lack of strong quality assurance monitoring and reporting mechanisms to prevent fraud and abuse, and outdated approaches to providing and tracking services. To overcome some of these obstacles, many programs, health

plans, and states are exploring or pursuing opportunities with on-demand TNCs such as Uber and Lyft to supplement NEMT services. Emerging opportunities have a scope to enhance NEMT services, and streamline the provision and monitoring of services (*38*).

Arizona, California, Colorado, Michigan, and Texas have signed NEMT contracts with Veyo, a TNC-like transportation broker, to provide on-demand trips (*38, 39*). Veyo service features include independent drivers and predictive analytics to provide transportation services to Medicaid beneficiaries. LogistiCare solutions, which is the largest broker in the nation, providing Medicare programs in 32 states, announced a large-scale partnership with Lyft to augment NEMT services in 267 cities across 31 states (*38, 40*). A pilot program was conducted in New York City with Lyft in partnership with National MedTrans Network, which is a privately owned national NEMT benefit manager, serving primary long-term managed care providers. As part of a pilot program, National MedTrans Network's call center operators can book Lyft rides for its clients using a web-based dashboard (called Concierge) designed specifically by Lyft for the pilot (*38*). This pilot program has yielded promising results such as cost-efficient trips, improved response time of three minutes with Lyft vs. 45 minutes with traditional service, improved data collection, and improved patient satisfaction. Achieving success with the pilot implementation, National MedTrans Network expanded its service area in New York City, and introduced its use of Lyft's services to its clients in California and Nevada, with potentially many states to follow (*38*). However, some challenges with TNCs providing NEMT trips include different drivers showing up for each ride - mitigating the potential for building strong relationships between beneficiaries and drivers - and some NEMT beneficiaries that potentially receive negative ratings from TNC drivers that can undermine beneficiaries' pickup opportunities etc., (*38*).

Mobility on Demand (MOD) Initiative and MOD Sandbox Projects

To address the rapidly-changing mobility market, FTA began conducting research on potential new mobility options incorporating emerging technological advancements. Research focus areas include promoting technology-enabled multimodal transportation services that are inclusive of transit; encouraging innovative partnerships; increasing transportation efficiency by making sure transit plays a vital role in the regional transportation network; and enhancing the customer experience by providing equitable, accessible, and traveler-centric service (*41*). With regard to these research goals, FTA developed its Mobility on Demand (MOD) initiative to enhance personal mobility by facilitating the establishment of local multimodal, integrated, automated, accessible, and connected transportation pilot projects (*41*).

MOD is a joint initiative of FTA and the US Department of Transportation's (USDOT) Intelligent Transportation Systems (ITS) Joint Program Office (JPO). According to USDOT, MOD is described as "an innovative, user-focused approach which leverages emerging mobility services, integrated transit networks and operations, real-time data, connected travelers, and cooperative ITS to allow for a more traveler-centric, transportation system-of-systems approach, providing improved mobility options to all travelers and users of the system in an efficient and safe manner" (*42*). Modes facilitated through MOD providers include carsharing, bikesharing, ridesharing, ridesourcing, scootersharing, microtransit, shuttle services, public transportation, and other emerging transportation solutions (*43*). Some goals of MOD providers include

demonstrating new services for users; achieving cost savings; enhancing convenience using a single interface for trip planning, payment, and other functions; increasing mobility options; improving transportation network efficiency; and providing an option for urban goods delivery (*43*).

In 2016, FTA and the ITS JPO launched the MOD "Sandbox" program. Eligible recipients included public transportation agencies, state/local DOTs, and federally recognized Indian tribes. Eligible activities include transit integration with various innovative MOD strategies such as planning and development business models, obtaining equipment and service, acquiring/developing software and hardware interfaces to implement the project, and operating the demonstration. FTA has approved a total of 11 MOD Sandbox projects at a total funding amount of $7,931,080 (*44*). Among the 11 projects, two that could potentially be applicable to rural or small urban areas are:

1. Vermont Agency of Transportation Statewide Trip Planner
2. Pinellas Suncoast Transit Authority Paratransit Mobility on Demand

These projects are summarized below.

Vermont Agency of Transportation (VTrans) Statewide Trip Planner

While most of the 11 MOD Sandbox programs include the integration of transit with innovative MOD initiatives in larger cities, the Vermont Agency of Transportation's (VTrans) $480,000 grant focuses on developing an online statewide transit trip planner that will incorporate flex-route, hail-a-ride, and other non-fixed-route services. This online trip planner could particularly benefit non-traditional rural transit systems, allowing better access to transit information for the public, including for people with disabilities (*44*). There are no specific emerging SUM practices included in this demonstration. However, this Sandbox project will develop an online trip planner for preparing travel itineraries for users which is similar to a rural Mobility-as-a-Service framework with limited functionalities. Among the 11 MOD sandbox projects, VTrans' MOD initiative is the only grant that demonstrates MOD initiatives in a rural setting.

The goal of VTrans' Sandbox project is to develop a statewide online trip planner (mobile and desktop-accessible statewide "OpenTripPlanner" applications) that can generate itineraries for the public using fixed and flexible transportation options. Users provide origin and destination information for generating travel itineraries. The OpenTripPlanner platform has been developed in such a way that it can be adapted, utilized, and scaled elsewhere (*45*). The OpenTripPlanner meets FTA MOD goals by marketing and promoting existing and emerging flexible transit services, and enhancing the customer experience for trip planning purposes using a standard interface mostly understood by riders that could be equitable, accessible, and traveler-centric (*45*).

The OpenTripPlanner application demonstration was launched for public use in March 2018. Relevant data was gathered during the demonstration period from March 2018 to March 2019 for an independent evaluation of the project. Figure 3.1 demonstrates the OpenTripPlanner "Go! Vermont" trip planner application with sample origin and destination locations. The trip planner provides various options for travel using existing transit options, as well as the cost of the trip

and estimate of the time it is available. When a dial-a-ride transit option is included in the trip itinerary, the trip planner provides further details about service eligibility, the phone number for making a reservation, and minimum advance reservation time needed. While Google Trip Planner could perform similar functions for trip planning in urban communities for fixed-route services, providing trip planning for flex-route, hail-a-ride, and other non-fixed-route services at a statewide level is not available (*45*).

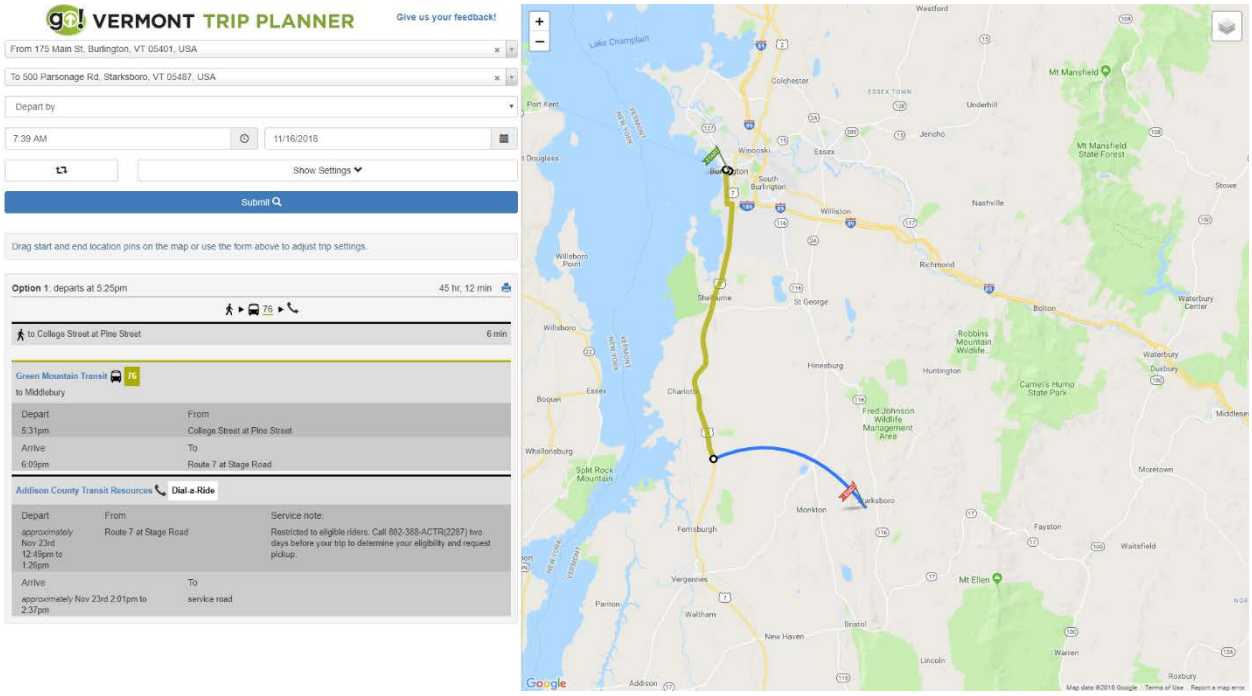

Figure 3.1: Sample Trip Details, and Travel Itinerary Generated Using Go Vermont Trip Planner.

VTrans' sandbox project goals include (*45*):

- developing an online trip planner for both fixed and flexible services,
- improving data presentation for transit agencies in Vermont,
- improving information for transit riders in the state,
- improving public transit use in Vermont,
- improving mobility for Vermont transit riders by cutting call/response times on relevant inquiries pertaining to route information and travel options, and
- obtaining lessons learned about project implementation.

Performance of the 'Go! Vermont' trip planner tool will be measured by conducting data analysis during and after the demonstration period. Some of the data analysis strategies proposed to determine the performance metrics of the planner include (*45*):

- performance analysis of "Go! Vermont" trip planner vs. Google Maps for 30 or more scenarios,
- web traffic data to planner website,

- before/after call/response time on relevant enquiries pertaining to travel options and route information,
- transit operator surveys, user surveys with questions about the planner and mobility, and stakeholder interviews.

Pinellas Suncoast Transit Authority (PSTA) Paratransit Mobility on Demand

Pinellas Suncoast Transit Authority (PSTA) provides public transportation services (fixed route, paratransit services, trolley service, and regional express bus service) to Pinellas County, Florida. In 2016, PSTA received a $500,000 MOD Sandbox project grant to demonstrate on-demand paratransit service though public-private-partnerships and utilize new technology available through TNCs to request rides. This MOD demonstration will leverage PSTA's existing partnerships with United Taxi and CareRide (services that provided paratransit service under its Demand Response Transportation (DART) program), and foster a key new partnership with Lyft to provide cost-effective and on-demand door-to-door paratransit service. With this new partnership, paratransit customers can have multiple transportation provider options including TNCs (through Lyft), taxis (through United Taxi), and wheelchair accessible vans (through CareRide), and choose the best option based on their needs such as arrival time, cost, etc. (*46*). With the new partnership with Lyft, PSTA expects to see significant cost savings compared to traditional services offered, and same day on-demand paratransit service (*46*). While this on-demand MOD sandbox project will be a demonstration project, PSTA hopes to continue this initiative after the demonstration period by identifying sustainable funding sources (*47*).

The pilot of the on-demand paratransit service using Lyft service began in March 2019. While Lyft service has a mobile application for reserving and paying for trips, PSTA initially intends for its users to call in to a special PSTA telephone number to make reservations using a third-party app provider (Lyft Concierge), process payments through already-existing Credit Merchant Services vendor, and then dispatch a Lyft driver for their trip. Potential paratransit riders could use any of the three transportation provider options (United Taxi, CareRide, Lyft) for making a trip. Cost of a paratransit trip using any of the three providers is the same ($4) for the rider, and PSTA covers the reminder of the cost. Based on first month of PSTA-Lyft operations, PSTA observed the majority of their riders choosing Lyft service over the taxi company for making ambulatory trips. One of main challenge observed in the initial weeks of operations include Lyft drivers cancelling trips when they could not find passengers at location mentioned in the ride request, and that drivers are not putting enough effort to finding the passengers before cancelling the trip. To overcome this issue, PSTA is working with passengers by informing them to be ready for their ride at the location before the ride arrives.

According to the 2017 census, the population of Pinellas County is estimated at 970,637. While there are 24 municipalities in the county, its two largest cities are St. Petersburg (population 263,000) and Clearwater (population: 115,000). While Clearwater could be considered a small urban community, the population of St. Petersburg is larger than that normally considered a small urban area. Because demand-response and paratransit services are more prominent in rural communities, lessons learned from PSTA could be applicable to encouraging SUM in rural communities.

Veterans Transportation Community Livability Initiative (VTCLI)

Veterans and military families are often under-served with regard to access to transportation, and face serious transportation challenges at home (*48, 49*). Four in ten veterans live in rural areas where there are limited transportation options. Moreover, these veterans and their families often need to travel long distances to receive medical care, reach employment centers, and access other needed services (*49*). To address the mobility challenges faced by veterans, service members, and their families, the U.S.DOT, together with the Departments of Defense (DoD), Health and Human Services (DHHS), Labor (DoL) and Veterans Affairs (VA), announced the Veterans Transportation and Community Living Initiative (VTCLI) in July of 2011 (*50*). The VTCLI grant program is managed and administered by FTA. FTA has awarded $64 million in grants to help veterans, military families, and others connect to jobs and services in their communities through specialized transportation services such as "one-call" or "one-click" ride centers, free transit passes, reduced transit fares, and software interfaces connecting medical scheduling programs with transit schedules (*48*). While various unique transportation solutions have been implemented through VTCLI grants, this review focuses on the one-call and one-click programs, as these initiatives relate to the demonstration of rural Mobility-as-a-Service framework of transportation services for veterans with limited functionalities.

One-call and one-click programs allow a veteran or military family to make one phone call or visit a user-friendly website to learn about the availability of transportation services that connect them to work, education, healthcare, and other vital services in their communities. For example, a veteran can use a one-call or one-click service to learn about the availability of commuter van services that travel to employment centers, vehicles equipped with wheelchair lifts that can provide rides to local physical rehab facilities, or buses that stop by the local mall (*49*). While the VTCLI program primarily supports improved mobility options for veterans and military families, it is structured to fund projects that will potentially benefit anyone living within the service area of a grant recipient (*48*). Therefore, improved and innovative mobility services in rural or small-urban communities funded under the VTCLI program may have broader applicability.

Michigan Mobility Challenge

The State of Michigan announced a "Michigan Mobility Challenge" grant for $8 million in June 2018 to invite multiple pilot transportation projects to solve mobility gaps for seniors, persons with disabilities, and veterans using new technologies and innovative service models in urban, rural, and suburban communities throughout the state (*51*). This challenge is a collaborative effort that includes agencies such as Michigan Department of Transportation (MDOT), PlanetM/Michigan Economic Development Corporation, the Michigan Department of Health and Human Services, the Michigan Veterans Affairs Agency, the Bureau of Services for Blind Persons, and the Michigan Department of Civil Rights – Division of Deaf, Blind, and Hard of Hearing. In response, 43 proposals were received requesting $27 million. MDOT announced a total of 13 projects selected for funding. Each of these projects are led by public and private partners to learn lessons about using emerging technologies to solve mobility gaps. Lessons learned from these implementations are intended to guide further app developments. A brief overview of the 13 projects selected for the $8 million Michigan mobility challenge grant include (*51*):

1) A grant of $187,000 was awarded to the Ann Arbor Area Transportation Authority (AAATA) for piloting autonomous securements of wheelchairs on 10 of its buses. This feature can help individuals with mobility devices to secure themselves with push of a button in less than 25 seconds.
2) A grant of $100,000 was awarded to Bedestrian for testing food and pharmaceutical delivery with autonomous delivery vehicles to serve some of the most vulnerable, homebound populations to help them stay independent and healthy.
3) A grant of $465,000 was awarded to the Capital Area Transportation Authority (CATA) to partner with LookingBus technology company to help encourage the independent use of public transportation for blind and visually impaired individuals.
4) A grant of $457,000 was awarded to Feonix Mobility Rising in partnership with AAATA to assist with the last 50 feet problem of locating bus stops and final destinations to enhance transportation service experience for everyone, especially seniors and individuals with disabilities.
5) A grant of $603,500 was awarded to the Flint Mass Transportation Authority (MTA) along with several partners to provide health and wellness transportation services to veteran communities.
6) A grant of $258,000 was awarded to Hope Network Transportation Services to develop a specialized mobility app to provide on-demand, personalized transportation services using specialized vehicles.
7) A grant of $402,800 was awarded to Huron Transit Corp. and its partners to creatively leverage and expand existing resources in Huron County and beyond to help meet the personal mobility needs for senior citizens, persons with disabilities, veterans, guests, and residents in general.
8) A grant of $233,000 was awarded to Kevadiya, Inc. for an Indoor Wayfinding project for veterans which innovates personal guidance for veterans navigating to their final point of care once they have reached their medical facility.
9) A grant of $1.2 million was awarded to the “Michigan Universal Vehicle Ecosystem Pilot” project team involving multiple public and private partners to develop a rideshare platform for the Upper Peninsula to increase accessible transportation options and decrease isolation for individuals with mobility challenges.
10) A grant of $1 million was awarded to the “Southeast Michigan Integrated Platform for Paratransit Services” project team with multiple public and private partners to create an online booking and trip management platform for users of AAATA, Detroit DOT, and SMART (suburban Detroit area) ADA paratransit services.
11) A grant of $990,000 was awarded to SPLT, a provider of ridesourcing platforms to improve paratransit and healthcare transportation in three rural Michigan counties by strategies such as improved alerts and reminders, and develop a mobile app for trip management.
12) A grant of $373,782 was awarded to the “Team Grand Rapids: Interurban Transit Partnership” project with multiple public and private partners to utilize a dynamic rideshare app to improve rider experience by shortening trip duration and reservation lead time for paratransit bus services in Grand Rapids.

13) A grant of $2.1 million was awarded to the “New Autonomous Mobility Vision for Michigan” project team with multiple public and private partners to create an autonomous shuttle at the Battle Creek Veterans Administration (VA) Medical Center to allow for extended hours of service to veterans.

These innovative mobility initiatives, which included many SUM implementations, are demonstrated in various community settings including rural, small urban, and urban areas. An in-depth study of SPLT ridesourcing platform in three rural Michigan counties is included as one of the case studies in Chapter 5.

Chapter 4: Rural Shared-Use Mobility Interviews

This chapter aims to better understand the applicability of various SUM practices in rural communities by learning from initial rural SUM implementations, as well as seeking input from SUM providers for successful rural implementations. Input for this chapter was gathered by conducting interviews with rural SUM operators, rural SUM program sponsors, and/or rural community stakeholders (such as transit agency representatives, city officials, state DOT representatives, etc.,). Interviews were primarily conducted by providing a survey link where interviewees were presented with a standard set of interview questions. Phone interviews were conducted with a few contacts. Interview questions focused on requesting information such as: motivations to launch rural SUM solutions; SUM operations description; arrangement of public-private partnerships if any; and opportunities, challenges, and best practices for rural SUM implementations. Appendix A presents the interview questions used in the survey questionnaire and for phone interviews. Interviews were also conducted with SUM providers in urban areas to identify opportunities-challenges-barriers for potential SUM implementation in rural areas. Appendix A also presents interview questions used specifically for SUM providers.

Thirty individuals were contacted to request interviews, and a total of seven interviews were secured. Completed interviews represent categories of SUM services such as ridesourcing, carsharing, and microtransit services. The following documents the major findings of each interview.

Ridesourcing Services

Uber: Interview with Policy Staff

Uber is the number one ridesourcing service provider in the United States, providing more than 15 million trips per day around the world. While Uber is available in nearly all urban communities in the United States, the bulk of its recent geographic growth occurred outside urban core areas. In general, expansion of Uber into less densely-populated areas is sometimes slower or more difficult than elsewhere, because Uber's business model is based on the demand from riders and the supply of drivers who are looking to make flexible income.

Furthermore, TNC's partnering with public transit agencies that could potentially subsidize ridesourcing trips to supplement/compliment transit services are more limited in rural areas. To help Uber's presence in less densely-populated areas, Uber began compensating drivers for longer pickups and trips. Uber also launched a service called UberHealth, which provides reliable NEMT trips for patients and caregivers. This service can be useful to provide critical transportation services to NEMT recipients in rural communities. Uber is willing to work with transit agencies, policymakers, and other transportation stakeholders to potentially augment existing services at a lower cost per rider, or to give their riders a larger radius of travel than fixed route bus service would provide at the same cost.

Lyft: Interview with Policy Staff

Lyft operates its services in more than 40 US states including some rural communities within these states. Lyft focused on securing a license to operate through statewide legislation that let them provide their service on a larger scale within a state, rather than having to go city by city. Lyft is a prominent ridesourcing service which has its presence not just in urban communities, but also in many smaller towns that includes rural communities. For the 150 smallest markets Lyft operated between 2017 and 2018, the company recorded a 25 percent increase in service availability and the trend has been continuing. Because Lyft is one of the big players in urban markets, the company is exploring ways to grow in rural areas as well.

With lower demand from riders and fewer available drivers in rural areas, providing prescheduled rides through its platform can be especially useful in rural markets. Prescheduled rides can be especially useful in helping drivers secure trips in advance, so they do not need to wait for extended times in their vehicle to receive a trip request. Further, Lyft's key to success in rural markets includes partnering with public agencies such as city, transit agency, etc. Public partnerships followed by big launch events with city officials and community members involved have effectively helped the company promote the launch of their service as well as attract drivers and passengers from the community.

Missouri HealthTran Partnership: Interview with HealthTran Program Manager

The Missouri Rural Health Association partnered with Feonix Mobility Rising, a ridesourcing SUM provider, to launch the HealthTran program across the state to overcome health care-related transportation barriers. Through public and strategic planning meetings, transportation has been identified as one of the top two issues for health care access across the state for more than 20 years. In rural areas in particular, public transportation services coverage is limited. In some communities, as little as one trip every two weeks to just one location is provided. Private transportation is non-existent and/or priced beyond use when travelling more than 5 miles.

The HealthTran partnership connects communities, primarily health providers, to Feonix's technology platform that provides a transportation resource using all available transportation services. The HealthTran partnership can coordinate and schedule rides within minutes or up to a month in advance. The partnership also created an on-demand ridesourcing volunteer driver program on the Feonix ridesourcing platform that is designed to fill mobility gaps. Volunteer drivers use their personal vehicles to provide rides and are reimbursed for mileage. The HealthTran partnership effort used FTA Section 5310 funding for mobility management staffing provided through Missouri DOT.

Some of the opportunities with the launch of HealthTran program include: 1) promising potential to use volunteer driver on-demand ridesourcing service in rural areas; 2) effective management, coordination, and scheduling of rides using a one-stop technology platform. 3) opportunity to use FTA formula funds for SUM operations, and enhance mobility in a cost effective way. Challenges faced with HealthTran program include: 1) broadband internet service is limited or non-existent in rural areas across the state; 2) delay in receiving funding for the program which caused financial hardships.

RubyRide Ridesourcing Service in North Mankato, MN: Interview with Program Technical Advisor

North Mankato is a rural community southwest of Minneapolis, MN, with a population of less than 14,000. North Mankato has traditionally contracted fixed-route service from the nearby city of Mankato (population: 40,000) to provide mobility options for North Mankato residents. However, the fixed-route transit service was ineffective with many shortcomings such as low ridership, limited span of service, the aging/disabled population finding it difficult to walk to bus stops and wait in inclement weather, limited or no passenger amenities, etc. TNCs such as Uber and Lyft have a limited presence in the Mankato/North Mankato area, with operations more prevalent on weekend nights during bar closing hours during the academic school year for Minnesota State University.

To address the mobility needs of aging, immigrant, post-secondary student, and disabled populations, and the community residents in general, the city of North Mankato explored solutions with technology advancements instead of a fixed-route service, and reached out to major ridesourcing providers. RubyRide expressed interest in North Mankato's initiative, and the city council funded a pilot project to test and subsidize its proposed on-demand ridesourcing service. The project also received positive response from the city's residents, business community, non-profit community, and human services community. Unlike using drivers who are subcontractors (as in Uber/Lyft systems), RubyRide plans to directly employ drivers which is perceived to provide for improved safety. While the RubyRide ridesourcing service is not launched in North Mankato at the time of the writing, it scheduled to launch July 2019. While the pilot was funded by city dollars, the city of North Mankato plans to seek state, federal, non-profit, and private partners to move the project out of the "pilot" status to a model that is sustainable.

Some of the opportunities for RubyRide service in rural community of North Mankato include: 1) effectively meet mobility needs of rural community residents, and transportation disadvantaged population with an on-demand ridesourcing service by employing drivers. 2) potential for local business community, non-profit communities/organizations, human service community to support and collaborate to resolve community's transportation barriers and fill mobility gaps. Challenges with RubyRide program in North Mankato include: 1) Funding for pilot ridesourcing implementation, as well as sustainable funding sources for continued operations; 2) Finding a TNC (ridesourcing provider) that is willing to engage with a smaller community on a contractual basis.

Carsharing Services

Rural Carshare Implementation in Breckenridge, CO: Interview with Director of Community Development

Breckenridge, Colorado is a rural resort community with a population of approximately 5,000 residents - but a huge visitor presence with mobility needs. To provide short-term access to automobiles for visitors, and as an alternative to visitors bringing motor vehicles into the city, Breckenridge partnered with Zipcar carshare to offer short-term car rental services. Eventually, the Zipcar carshare program was suspended as car placement locations and the business model

didn't effectively serve the resort community market, and visitors were largely unaware of Zipcar service availability in town. However, Uber and Lyft began operations in Breckenridge without any partnerships, and were successful with their operations.

SUM Agency Interview: MAVEN Carsharing: Interview with Smart Cities Chief

Maven Carsharing is General Motors' traditional station-based service using Maven-owned vehicles. Owners of 2015 or newer GM vehicles models can also have their vehicles made available for peer-carsharing service on the platform. The Maven carsharing service is available only in larger US cities. The service was created to address urban mobility for individuals who don't want to own a vehicle. Some of the barriers noted for the potential applicability of the service in rural communities include lack of knowledge for SUM service providers about the mobility needs of the rural market, and potential expensive operational costs for performing activities such as maintenance, repairs, cleaning, towing, repossession, etc., Some of the strategies suggested to promote carsharing and SUM services in rural communities include: 1) characterizing the challenges and individual use cases SUM providers would be addressing in rural market, 2) re-imagining the mobility platforms to better suit rural community case studies, 3) providing opportunities for rural community representatives to gain knowledge about SUM solutions, and begin interacting with various mobility providers to pursue relevant opportunities. As for Maven, the peer-carsharing service may represent an opportunity with less complex potential operations for rural communities.

Microtransit Services

Via: Interview with Director of Strategy and Business Development

The Via mobility platform enables trips for multiple passengers heading in the same direction to seamlessly share a ride, as well as rerouting the vehicles in real time in response to demand. This platform can be categorized as a microtransit service with dynamic routing (*1*). Via operates in several large US cities (New York, Chicago, Washington D.C., etc.). However, it has also operated in Arlington, TX, and has demonstrated that its platform can be successful in smaller communities as well. Further, the interview with Via representatives also indicated that rural deployments are one of the best-use cases for their technology, and Via's platform is likely most efficient and affordable solution for providing transportation services in rural communities. Because rural communities may not have sufficient population density to support well-utilized fixed routes, they can benefit from an on-demand option such as Via that ensures a small fleet is routed directly to existing demand, without needless vehicle miles travelled. Limited funding availability is the only factor observed as a barrier for potential rural implementations for Via operations. Leadership, specifically from federal and state programs could be extremely helpful for deployments of shared on-demand mobility (dynamic microtransit) services. Usually governments tend to pay high capital expenses, and low operating expenses for transit/transportation services. However, because Via is a capital-light business model, additional funds for operating would be useful for shared mobility deployments in rural markets.

Chapter 5: Rural Shared-Use Mobility Case Studies

Eight in-depth case studies were conducted to cover rural SUM implementations such as ridesourcing, carsharing, bikesharing, vanpool, and microtransit services. To cover statewide SUM initiatives, the statewide vanpool (a type of ridesharing) initiative in Pennsylvania is also profiled. There are currently no microtransit implementations in rural or small urban communities. Most urban microtransit providers such as Bridj and Chariot ended or faced problems with their US operations. However, Via, Inc. operates microtransit in Arlington, TX, a fairly small community with population under 400,000 and was included as a case study to understand its operations and potential to fill mobility gaps in small communities.

While there are a very limited number of rural SUM implementations, case study candidates were selected to be representative of the four SUM service categories of interest in this study, as well as a vanpool service. In selecting candidates, the research team looked for candidates that were geographically distributed, addressed unique mobility challenges, and involved diverse supporting agencies/organizations that fill mobility gaps and advance rural mobility by applying innovative technologies. Most rural SUM implementation began in 2017 and 2018; a few of the case studies presented began operations in 2019, or are yet to begin in 2019.

Case Study 1: Needles Carshare Program in Rural California

Victor Valley Transit Authority (VVTA) collaborated with Enterprise Carshare to create the Needles Carshare program in the rural community of Needles, CA. The program officially launched on August 8, 2016. VVTA is a Consolidated Transportation Services Agency (CSTA) for the Needles, CA, area, coordinating transportation services to fill mobility gaps for rural and isolated communities in its region. This successful rural carshare program has gained national attention and the revenue generated from the program has paid for most of the costs associated with running it.

Case Study Facts

Summary

Needles Carshare is a rural small-scale carshare program providing a flexible transportation option for carless rural residents, helping them overcome isolation, become independent, and access basic facilities.

Lead Agency

Victor Valley Transit Authority

Supporting Agencies

Desert Communities Federal Credit Union, Enterprise Carshare.

Year Launched

2016

Impact

50 registered members, 70 percent of the program cost covered by utilization revenue generated.

Program Background

In the last half century, the city of Needles, CA has seen a steady economic decline reflected by increasing poverty and business closures (*52*). Currently, a quarter of its 5,000 residents live below the poverty line (*53*). Most of them don't have cars, and businesses such as 99 Cents Only and Dollar General stores recently closed, reducing grocery store options for residents (*52*). Needles Area Transit (NAT) is a public transit agency in the area which runs two loop routes and operates dial-a-ride service within the city limits.

However, most products like fresh produce and groceries, as well as medical facilities, and other essential services are located in two nearby cities, Laughlin, NV, and Bullhead, AZ, which are approximately 25 miles from Needles. Providing public transportation services to these nearby cities was a challenge for the city, because these cities are located in two different states, Nevada and Arizona. To find a mobility solution, community residents/representatives reached out to San Bernardino County. They learned that CSTA provider VVTA could coordinate transportation services to fill mobility gaps. In California, CSTA's are designated by various state entities to provide transportation services on top of local transit agency services to mitigate gaps. While VVTA provides its traditional transit operations in Victorville and Barstow, CA, it is also a CSTA for about 950 square miles covering multiple cities and remote rural communities. Needles, CA, is a remote and sparsely populated rural community within VVTA's CSTA service area. VVTA already operates a service called "Route 200" every Friday, providing transportation

services for people from Needles to cities such as Barstow (145 miles away) and Victorville (175 miles away) in California to access basic services (*54*).

Analyzing the unique situation of Needles with its location on the California border, the CSTA director identified an option to provide a small affordable carshare program in partnership with the Enterprise Carshare program to help people transport themselves to nearby cities such as Laughlin and Bullhead to access basic facilities. To convince Enterprise to partner in such a small-scale operation, VVTA offered a guaranteed monthly minimum payment to cover the carshare program costs regardless of the usage. This subsidy from VVTA allows for carshare program users to pay just $5 per hour to use the car without membership cost or a signup fee. To provide the subsidy, VVTA funds the program directly out of its budget.

Program Specifics

The Needles Carshare program launched August 8, 2016 and features two cars, a Nissan Altima and a Dodge Caravan. Members pay just $5 per hour to use a car, which includes insurance and fuel. VTTA subsidizes the program, so there is no membership cost or sign-up fee. As of August 2017, the program had 50 members, with the Dodge Caravan being the vehicle used most often. In fact, revenues generated from ridership pays close to 70 percent of the program's cost while VTTA paid the other 30 percent. The $5 per hour fee includes fuel for up to 200 miles per trip. Users are charged 33 cents per mile for miles exceeding 200 miles per trip. The program is available 24 hours a day and seven days a week. Users must be licensed drivers who are 21 or older. Users can become members by signing up, and can later reserve a car online for a desired date and time. The two vehicles are located in a parking facility of a local bank, Desert Communities Federal Credit Union. An Enterprise Carshare kiosk is also available inside the bank for users/members to make reservations if they do not have access to a computer or smartphone. For residents who don't have credit cards, VVTA worked with a local financial company, Sole Financial, to create payroll debit cards that people can use for the carshare program.

To perform basic maintenance for the two vehicles, Enterprise contracts with local shops in Needles. While there is no local Enterprise rental car service in Needles, there is one in Bullhead, which is 23 miles away. If there is any major maintenance needed for Enterprise Carshare vehicles, the Enterprise office in Bullhead provides another car while major maintenance is performed in one of the Bullhead maintenance shops.

Outcomes

Needles Carshare has been very successful, providing affordable mobility to car-less residents, low-income populations, and seniors having driver's licenses and wanting to stay independent by not relying on dial-a-ride service. The service provides access to fresh produce, medical care, and other basic facilities in nearby cities. The revenue generated by the program has covered about 70 percent of the cost of the program, which is much higher than the traditional fare box revenue received for rural transit programs. VVTA has to pay only for 30 percent of the

program. VVTA pays an annual cost of approximately $19,000 for the two cars. The cost would have been $32,000 if there was no utilization revenue generated. The program has been so popular and completely booked at a certain point in its initial stages that Enterprise representatives had difficulty scheduling vehicle maintenance. The minivan is the most popular of the two vehicles, and often four families share the cost so they all can go grocery shopping at the same time.

According the March 2019 utilization report, 48 percent of the trips made using the program are close-proximity trips to cities such as Laughlin, and Bullhead, as well as other nearby destinations. The remaining 52 percent of the trips are to more distant destinations (*54*). The CTSA director for the Needles area thinks that the rural carshare program is an untapped resource and is a unique solution for meeting transportation needs in rural areas. However, a transit agency or other agency needs to provide leadership to establish the program and demonstrate that it is going to be successful.

VVTA plans to continue subsidizing Needles carshare to maintain the cost to users of $5 an hour. Further, to meet the goals of California Air Resources Board, VVTA is currently exploring options for Needles Carshare to go fully electric as well as to establish an additional rural carshare program in Trona, CA, which is in its CTSA service area (*54*).

Case Study 2: Green Raiteros Electric Vehicle Ridesourcing Program in the Rural Community of Huron, California

The Latino Environmental Advancement & Policy (LEAP) Institute developed the Green Raiteros program for Huron, CA, residents in 2018. This non-profit rural ridesourcing service featuring electric vehicles provides an affordable transportation option for residents to reach critical services. This program is an evolution of an informal, self-organized service that local retired farmers have been providing for decades as an alternative to a six-hour transit round-trip to Fresno, CA.

Program Background

Huron, a rural community in central California, has a predominantly Latino population of more than 7,000. It is one of California's poorest communities and a quarter of its residents don't own a car (*55*). For years, Huron residents benefitted from an informal and coordinated ridesourcing service called "Raiteros," where retired farmworkers provided rides to local residents. The maximum distance for the service was to Fresno, CA, a nearby large city located one hour away from Huron (53 miles). Raiteros used personal vehicles and provided rides for residents to access hospitals, government agencies, and other critical services. Most of these services are located in Fresno, CA. In return, Raiteros charged the riders gas and lunch expenses which are expensive for the already-poor residents of Huron. While there is a bus service once a day between Huron and Fresno, it is six-hours round-trip which was felt to be a physical barrier for the community. The Raiteros service is frequently used as some residents direct 20-30 percent of their income towards transportation expenses.

Case Study Facts

Summary

The LEAP Institute developed the program and secured funding from two sources to launch "Green Raiteros," a non-profit EV rural ridesourcing program.

Lead Agency

LEAP Institute

Supporting Agencies

Schmidt Family Foundation, Shared-Use Mobility center (SUMC), and EVgo.

Year Launched

2018

Impact

Affordable ridesourcing trips to critical services, and provision of economic-environmental-climate-health-transportation justice with one program.

To strengthen the Raiteros service, the mayor of Huron explored funding opportunities in California for initiatives that reduced greenhouse gas emissions. In January 2017, grant funding of $519,400 was provided by the California Public Utilities Commission to form the Green Raiteros program. The Schmidt Family Foundation also provided a grant of $69,000 to the

program (*55*). This funding was provided to the Latino Environmental Advancement & Policy (LEAP) Institute to develop the Green Raiteros program. The LEAP Institute is a Fresno-based non-profit organization which oversees economic and environmental justice for San Joaquin Valley communities including Huron (*56*). The Green Raiteros programs is designed to connect predominantly Latino and agricultural families in Huron to the communities of Fresno, Hanford (30 miles away), and Lemoore (23 miles away) using two electric vehicles. The program provides ridesourcing services for medical services, schools, shopping, government services, etc. For this program, the LEAP Institute partnered with EVgo to establish 10 Level 2 charging hubs in Huron and an additional charging station in central Fresno. The LEAP Institute also partnered with the Shared-Use Mobility Center (SUMC) to provide a business plan for the Green Raiteros project and with the Fresno County Rural Transit Authority (*57*). The funding received for the project was used to lease a headquarters facility, hire staff and pay administrative costs, and the purchase of two electric vehicles (a new Chevy Volt and a used BMW i3) (*55*).

Program Specifics

The non-profit Green Raiteros rural ridesourcing service was launched on October 12, 2018. The program has two electric vehicles and four veteran retired farmworkers serving as volunteer drivers to provide affordable transportation to underserved individuals. Trip costs for the Green Raiteros program are supposed to be more affordable compared to the previous informal Raiteros program. The program is intended to increase public health, education, and economic empowerment for rural families. Drivers will use the two electric vehicles to provide on-demand ridesourcing services for Huron residents. Rides may be shared if people are going to same location at about the same times. Drivers will receive insurance from the program, and will be reimbursed for their miles driven. Riders can book a ride 24 hours in advance with drivers by a phone call or by visiting the Green Raiteros office. The program hopes to expand soon with more electric vehicles and up to 12 drivers making 100 trips a day (*56*). Plans also call for a smartphone application for making reservations and managing rides.

Case Study 3: Michigan Mobility Challenge Grant to Improve Demand Response and Healthcare Transportation Services in Rural Counties.

Bosch/SPLT acquired a grant of $990,000 from the $8 million Michigan Mobility Challenge grant program to solve mobility gaps for seniors, persons with disabilities, and veterans using new technologies and innovative service models. SPLT will use the funding to improve demand response and healthcare transportation services in three rural Michigan counties by integrating the SPLT Rides platform with software already being used by rural transit agencies; reduce cancellations and no-shows with improved alerts and reminders; develop a mobile app to reduce user effort to schedule rides; and coordinate the volunteer driver pool with enhanced web portal.

Case Study Facts

Summary

Bosch/SPLT received $990,000 funding to improve demand response and healthcare transportation services in three rural Michigan counties.

Lead Agency

State of Michigan

Supporting Agencies

Bosch/SPLT, Bay Area Transportation Authority, Benzie Transportation Authority, and Allegan County Transportation.

Year Launched

2019

Projected Impact

25 percent enrollments in new platform, 20 percent reduction in trip cancellations, 10 percent reduction in no-shows, 10 percent increase in rides.

Program Background

The State of Michigan announced a Michigan Mobility Challenge grant opportunity of $8 million in June 2018 and invited local partnerships to propose pilot transportation projects to solve mobility gaps for seniors, persons with disabilities, and veterans using new technologies and innovative service models in urban, rural, and suburban communities throughout the state. Michigan DOT selected 13 projects for funding (*51*).

SPLT, a provider of ride-sharing platforms which was acquired by Bosch in 2018, received funding from MDOT in the amount of $990,000 to improve paratransit and healthcare transportation services in three rural Michigan counties: Grand Traverse County, Benzie County, and Allegan County. Grand Traverse and Benzie are adjacent counties and located in northwest Michigan, and Allegan county is located in southwest Michigan (Figure 5.1). All three counties have paratransit services (which can essentially be called demand-response services as anyone can access them), which operate in their own unique way with various dispatch software; Grand Traverse and Allegan counties also utilize volunteer drivers for providing NEMT trips. Transit agencies and their dispatch software include Bay Area Transportation Authority for Grand Traverse County using Easy Rides software (product of

Mobilitat); Benzie Transportation Authority for Benzie County using PC Trans software; and Allegan County Transportation for Allegan County using Route Match. Figure 5.2 illustrates the demand-response service operational structure for the three counties. SPLT will use the funding to develop and demonstrate interoperability between various dispatch software used by the different rural transit systems; reduce no-shows and cancellations by using triple confirmation system and improved alerts; develop a mobile application for users to enroll and request rides; and provide access to an enhanced SPLT web portal where the managers for volunteer driver pools and volunteer drivers can login and access ride requests, ride assignments, and other information. Figure 5.2 also illustrates enhanced service operational structure with SPLT integration.

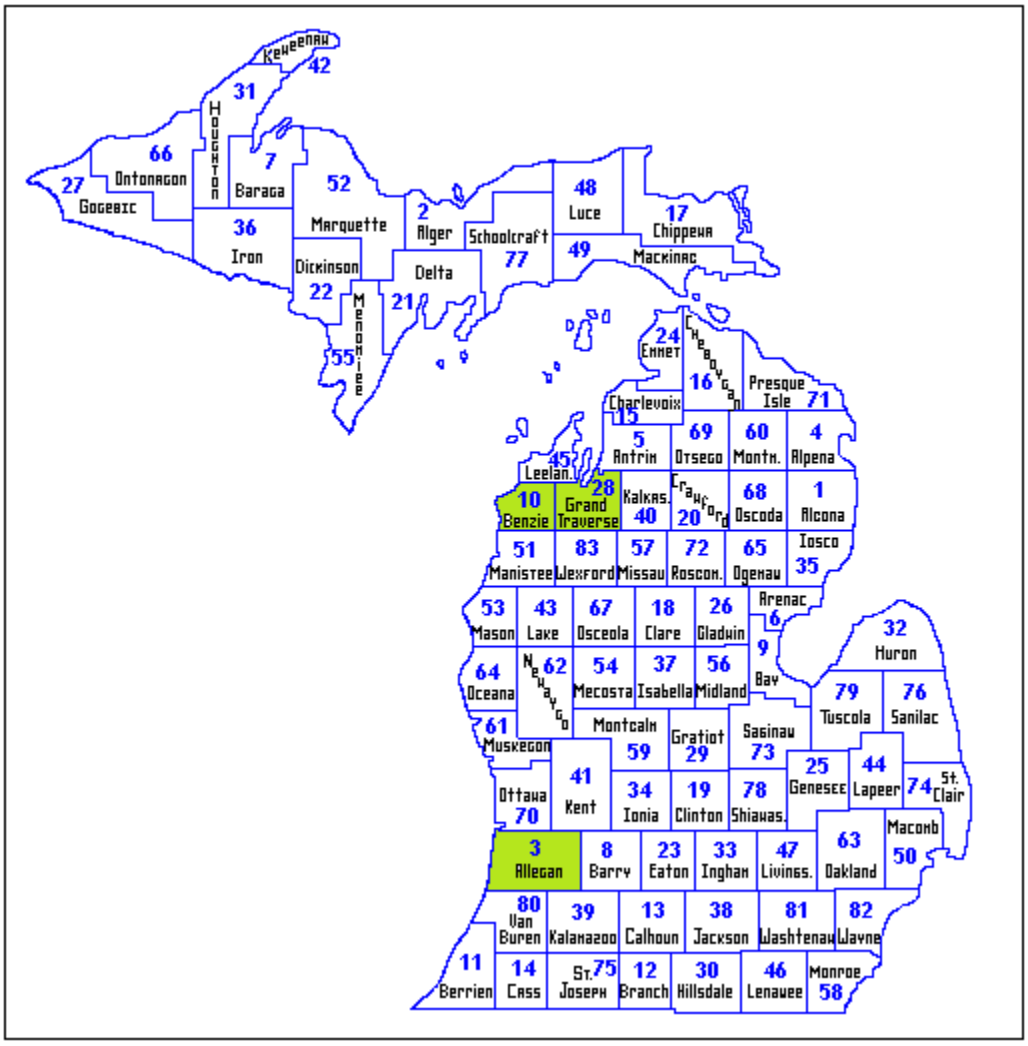

Figure 5.1: Michigan Counties Map Showing Three Counties Studied for Bosch/SPLT Michigan DOT Grant.

Source: Michigan.gov (*58*).

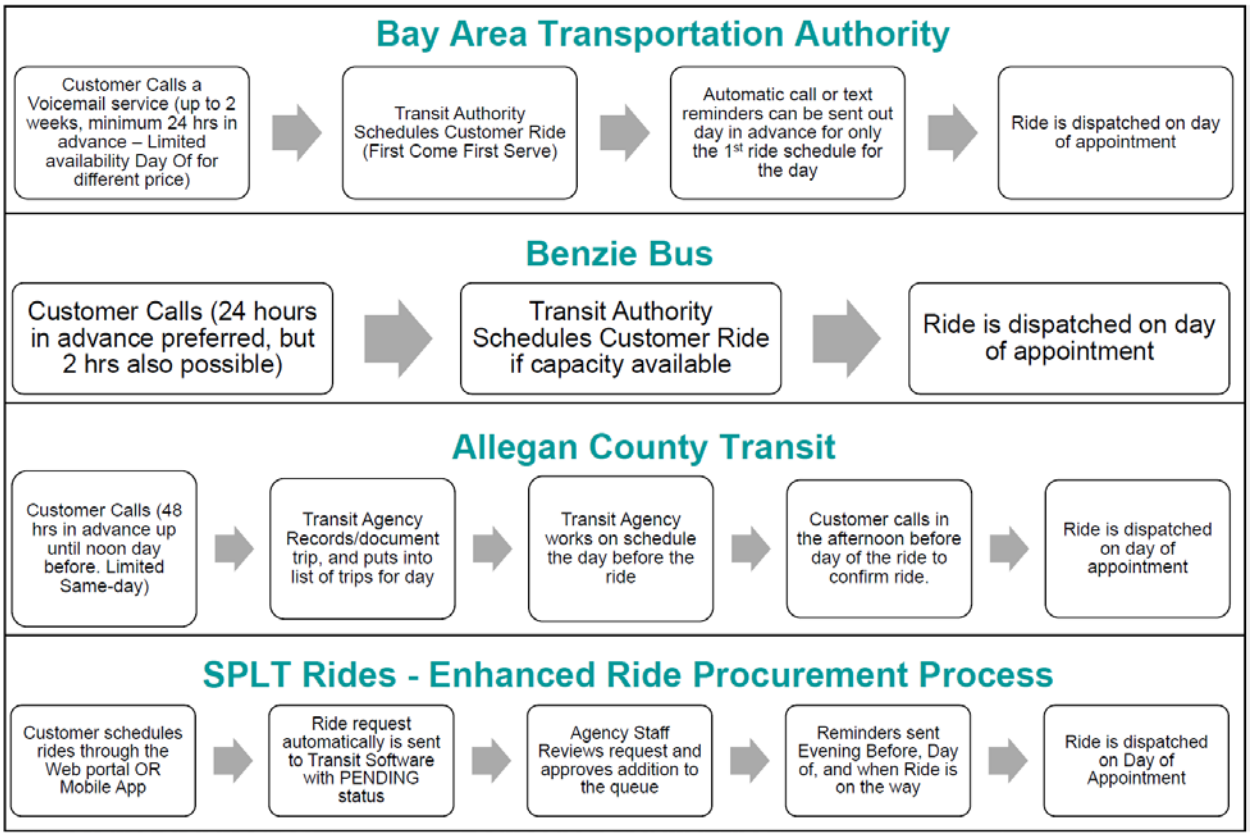

Figure 5.2: Current and Proposed Demand Response Operational Structure for Three Rural Transit Agencies in Michigan.

Source: Bosch/SPLT (*59*).

Program Specifics

The Bosch/SPLT pilot is anticipated to commence operations in August 2019 and will end in December 2019; as of this writing, SPLT is in the process of project setup and conducting groundwork for deploying its operations.

The project plans to accomplish four different goals using four phases in the three rural Michigan counties during the pilot's first year of operation (Figure 5.3) (*59, 60*). These goals include:

1. **Improve interoperability between rural transit agencies**: Rural transit agencies often operate different dispatch software/technologies which do not communicate with each other (Example: Easy Rides for Bay Area Transportation Authority, PC Trans for Benzie Transportation Authority, and Route Match for Allegan County Transportation), so it is difficult for riders to book a ride and travel across the state using multiple rural transit agency services. SPTL will use its Rides platform and integrate Application Programming Interfaces (APIs) with individual agency software (PC Trans for Benzie Transportation Authority, and Route Match for Allegan County Transportation). Riders

will then be able to request rides using a specialized web portal that SPLT will develop, and the SPLT Rides platform will communicate to individual transit agency software to request trip reservations. Figure 5.4 illustrates the SPLT system architecture. The interoperability feature will be demonstrated in this pilot for feasibility in Benzie and Allegan Counties. When such a service is rolled out statewide sometime in the future, a rider will be able to book a ride with ease among multiple transit agencies on a single web portal. SPLT will not be able to integrate the SPLT Rides platform APIs with Bay Area Transportation Authority's Easy Rides software, as the Authority's Easy Rides contract will be ending soon and it might take almost a year for the agency to identify new software.

2. **Reduce no-shows and cancellations for scheduled rides**: SPLT will develop a triple confirmation system where automatic phone calls/texts will confirm the trip with 1) the rider, 2) the healthcare provider or destination contact, and 3) the caretaker/companion/adult children of the rider. Further, the system will also generate enhanced reminders the evening before the ride, the morning of the ride, and when the ride is on the way. These strategies were proposed to reduce no-shows and cancellations.
3. **Develop a mobile application**: The mobile application will be developed in phase 3 where riders will be able to enroll additional riders, make trip reservations, and track the status and activity of reservations. The mobile app would reduce the effort needed by users to schedule rides. People will still be able to call the transit agency to make reservations if they do not have access to smart phone/computer. The mobile application will be developed for Benzie and Allegan counties as the SPLT Rides platform could be integrated with their software.
4. **Volunteer fleet coordination**: Allegan and Grand Traverse counties operate volunteer driver pools that help take patients to medical trips. While the volunteer driver pool is traditionally coordinated with third party software or excel spread sheets, often multiple reservations are created for a single trip when a rider calls different providers to reserve it. SPLT plans to develop an enhancement to the web portal where the managers of volunteer driver pools can login and see ride requests qualifying for volunteer rides, and similarly volunteer drivers can login to see their ride assignments and receive needed information. The SPLT Rides platform will also reduce trip duplications in the trip reservation process.

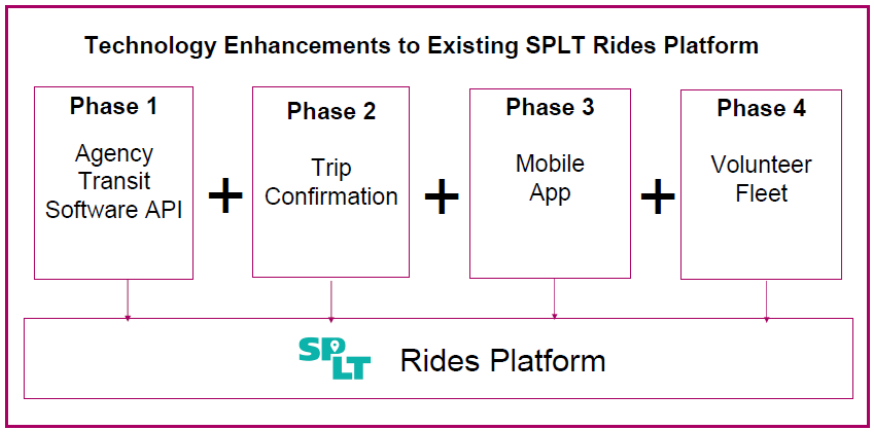

Figure 5.3: Work Plan and Phases for Bosch/SPLT Contract.

Source: Bosch/SPLT (*59*).

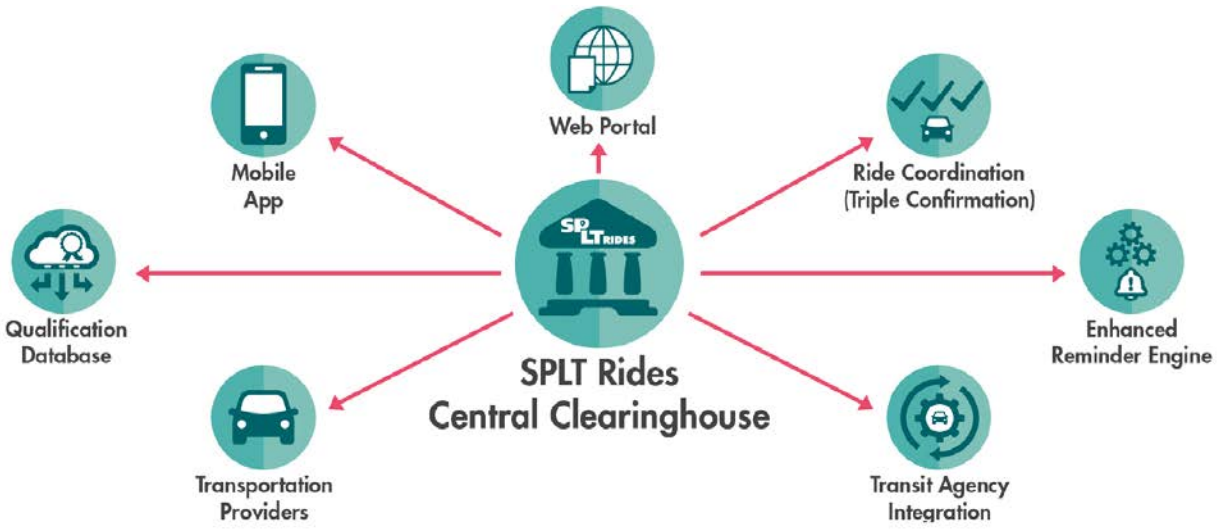

Figure 5.4: Finalized SPLT Rides System.

Source: Bosch/SPLT (*59*).

Outcomes

While project operations have not been launched as of this writing, initial phases will begin in August 2019, and all phases will complete their demonstrations by December 2019. Once operational, and based on any challenges faced, the Bosch/SPLT team will evaluate and make adjustments to the project to achieve its goals. Some of the success metrics identified by the Bosch/SPLT team for this project through the four phases of initial operations include:

1. Enroll at least 25 percent of eligible users to the new platform (phone app or web portal) to procure rides from each deployment
2. Reduce duplicated effort of agency and volunteer fleet by 100 percent using the SPLT platform
3. Reduce cancellations by 20 percent, and no-shows by 10 percent
4. Increase number of rides delivered by 10 percent

Case Study 4: Rural Mobility as a Service in Winnebago County, Wisconsin – Winnebago Catch-a-Ride.

Winnebago County, Wisconsin received an Accessible Transportation Community Initiative grant of $100,000 from Easter Seals Project Action (ESPA) Consulting to develop and implement recommendations to fill its rural mobility gaps. A rural mobility as a service (MaaS), Winnebago Catch-A-Ride (WCAR) program was created to integrate all available transportation services on one single platform, as well as add a ridesourcing program with volunteer drivers on the Feonix Mobility Rising platform. The Greater Oshkosh Economic Development Corporation received a $30,000 "Commute to Careers" grant from the Wisconsin Department of Workforce Development which was also used for the WCAR program to subsidize employment trips for unemployed, underemployed, disabled, and low-income workers in Winnebago County.

Case Study Facts

Summary

Several Winnebago County entities created Winnebago Catch-A-Ride Rural Mobility as a Service program by collaborating with Feonix Mobility Rising and QRyde.

Lead Agency

East Central Wisconsin Regional Planning Commission

Supporting Agencies

Make the Ride Happen, Winnebago County Health Department, Wisconsin Department of Workforce Development, University of Wisconsin-Extension.

Year Launched

2018

Impact

Reduce mobility gaps, and provide available services on-demand.

Program Background

The rural county of Winnebago, Wisconsin covers almost 580 square miles and has a population base of about 170,000 (*61*). While there are transportation services in the county, there are also significant mobility gaps and barriers to travel. To address these rural mobility gaps and barriers, individuals from several sectors of Winnebago County formed the "Winnebago County Rural Transportation Conversation" in 2016. This committee is led by the East Central Wisconsin Regional Planning Commission. The group used strategic planning tools to identify goals such as improving employment and healthcare transportation, managing already existing transportation assets, and filling mobility gaps (*62*). Winnebago County received a two-year Accessible Transportation Community Initiative grant in 2017 from ESPA Consulting in the amount of $100,000 to develop an action plan and implement the recommendations to improve independent mobility to rural residents for one year.

One of the recommendations from the action plan was to develop a pilot project to fill rural mobility gaps. To address this recommendation, Winnebago Catch-A-Ride (WCAR) was developed in October 2018 for a one-year pilot lasting until September 2019. WCAR does not intend to duplicate already-existing transportation services, but will fill any mobility gaps especially during nights and weekends.

Goals of WCAR program include (*62*):

1. Partner with Winnebago County employers to increase access to transportation for their employees,
2. Identify gaps in transportation and how they can be met in Winnebago County,
3. Partner with Winnebago County healthcare providers to increase access to transportation for their patients,
4. Coordinate existing transportation assets of Winnebago County, and
5. Expand the County's Make the Ride Happen volunteer driver program.

Program Specifics

WCAR used the Feonix Mobility Rising platform and volunteer drivers to fill mobility gaps that were not served before. For the WCAR program, volunteer drivers will use their personal vehicles to provide ridesourcing-like trips on the Feonix Mobility Rising platform. Riders will be charged a $2 booking fee and a federal mileage reimbursement rate of $0.58 per loaded mile which makes the service affordable in rural communities. Payment from the riders will go directly to drivers. Riders need to use a call-in number to request rides, but soon a smart phone application will be available for riders to request and pay for their rides. Volunteer drivers for the program are hired by WCAR project partners (the East Central Wisconsin Regional Planning Commission and the Make the Ride Happen program) by conducting multiple outreach meetings within the county, attending career fairs, and advertising on mediums such as Indeed career website, Facebook, etc., As of March 2019, WCAR has six volunteer drivers distributed throughout Winnebago County. However, the WCAR program's goal is to hire 20 volunteer drivers to meet the unmet transportation needs (*61*). The screening process for adding volunteer drivers includes conducting interviews, background checks, and vehicle inspections (*62*). Insurance for the volunteer drivers is covered under the Feonix Mobility Rising Volunteer Insurance through CIMA, which is the largest volunteer driver insurance program in the United States (*62, 63, 64, 65*).

WCAR uses the QRyde technology platform which implements low-cost transportation solutions and can be accessed by call center, website, and smartphone app. QRyde for WCAR is administered and branded by Feonix Mobility Rising (Figure 5.5). QRyde technology used for WCAR also has a capability to create a centralized list of other transportation services along with the ridesourcing volunteer driver service. Transportation providers who choose to participate in the WCAR program can be listed in the QRyde platform, and riders can access all available transportation options for their area (*62, 64*).

Figure 5.5: Web Portal and Smart Phone App for WCAR Program.

Source: Winnebago County, 2019 (*62*).

Make the Ride Happen, a program of Lutheran Social Services, provides information about transportation services to the public and has operated a volunteer driver transportation service for elderly and disabled individuals in Winnebago County for more than 15 years. Make the Ride Happen receives FTA Section 5310 funding for operating its transportation services. While Make the Ride Happen is still exploring additional funding to expand their services to everyone in the County, a part of the ESPA Consulting grant money was used to develop a unique website for Make the Ride Happen to provide a one stop shop for anyone interested in transportation services (*65*). Make the Ride Happen also provides assistance for WCAR riders with their local call center.

Apart from the ESPA Consulting grant, the Greater Oshkosh Economic Development Corporation (GO EDC) received a $30,000 “Commute to Careers” grant from the Wisconsin Department of Workforce Development. GO EDC contributed this grant to the WCAR program to subsidize WCAR fares for unemployed, underemployed, disabled, and low-income workers. Qualifying riders for this program only pay $0.25 per loaded mile (miles travelled with rider on-board), and the grant will cover the additional $0.33 per loaded mile and the $2 booking fee (*64*). Apart from subsidizing employment rides, WCAR project partners are also working toward providing medical trips by partnering with a local clinic “Partnership Community Health Center” to reduce the no-show rate.

Outcomes

The first ride from WCAR was provided on Feb. 9, 2019, and by April 25, 2019, a total of 84 rides were provided by six volunteer drivers. While WCAR is in its initial stages of operation, the project partners believe that it has so far been successful in meeting transportation needs in Winnebago County, and are applying for additional grants to extend the program for three more

years. One of the challenges identified by the WCAR project partners for Winnebago County – and rural communities in general – is that the strength and coverage of internet service is not adequate to operate a reliable ridesourcing service with a smartphone application. There is a need to have a better broadband internet coverage in rural communities for technology-enabled services to exist and succeed (*65*).

Case Study 5: Via Microtransit Service in the City of Arlington.

In 2017, the City of Arlington, TX, partnered with Via Transportation, Inc., to provide on-demand ridesourcing as a public transportation solution (referred to as microtransit service) to its central business district. The budget for the first year's operations was funded by the city and FTA. The Via microtransit service replaced a fixed route-bus line to provide on-demand trips in premium vans. The microtransit service has proven very successful, with the city expanding the service area several times and adding more vehicles to meet the demand.

Program Background

The City of Arlington had contracted a fixed-route bus line, MAX, to run between the University of Texas at Arlington and a commuter rail station near the Dallas-Fort Worth airport since 2013. MAX's service area was constrained, offering very few connections within the city. Ridership averaged 250-300 per day, without prospects for improvement. To provide a broader coverage area and to offer on-demand ridesourcing services as requested by its residents, the city's Transportation Advisory Committee suggested new microtransit service as a flexible, right-sized service to replace the MAX. This innovative transportation solution also aligns with the Arlington City Council's priorities to "Put Technology to Work and Enhance Regional Mobility (*66*)."

Case Study Facts

Summary

The City of Arlington is the first city in the nation to offer on-demand ridesourcing as its sole public transportation solution.

Lead Agency

City of Arlington

Supporting Agencies

Federal Transit Administration (FTA), Via Transportation, Inc., Mercedes-Benz

Year Launched

2017

Impact

100 percent increase in public transit ridership, 97 percent customer satisfaction rate, and efficient public transportation service.

MAX bus operations ended in December 2017 with the launching of the Via service.

The City of Arlington partnered with rideshare provider Via to pilot the on-demand microtransit service with a project cost of $922,500 for the first contract year. The city contributed approximately one third of the project budget in the amount of $322,500 from the city's general budget. The rest of the $600,000 budget was secured with a Job Access and Reverse Commute (JARC) grant from FTA (*66*). The project contract period is one-year, with four one-year renewal options. For the contract amount, Via provides vehicles, drivers, technology, and routing. Via microtransit service is designed to provide affordable transportation to key areas of Arlington by connecting riders to entertainment centers, shopping, dining options, work, school, medical appointments, etc., Unlike a fixed-route bus system, Via service is more of a

personalized transportation option where users are picked up where they want to be picked up in smaller premium vehicles. Arlington is the first city in the nation to offer an on-demand ridesourcing type of service as it sole public transit solution (*66*).

Program Specifics

Via microtransit service was officially launched in Arlington on December 11, 2017, to provide affordable and on-demand public transportation trips in 10 six-passenger Mercedes-Benz Metris passenger vans (Figure 5.6). Customers can book a ride in one of these vans using a Via smartphone application, and Via's sophisticated technology will match the customer with other riders going their way. Figure 5.7 illustrates steps involved in booking a ride using the Via mobile application. Via is also a cashless service. For users who do not use a smartphone, rides can be requested by calling a live support phone line, but users have to initially setup a Via account by contacting a Via representative. Rides are charged a flat rate of $3 per trip. The Via fare is subsidized to make the on-demand transportation option affordable. Without subsidies, the cost per trip is approximately $9 which is much less than the cost per trip for the previous MAX fixed-route service (*66, 67*). Via users also have an option to purchase a weekly pass for $15 which allows them to take up to four rides each day, six days a week.

Via has a partnership with Mercedes-Benz, which donated the Metris vans for the microtransit pilot, helping Via reduce costs. Via's service in Arlington was deployed in phases, including a "soft launch" in the first month to get the service up and running smoothly, followed by full launch in January 2018. The service was very successful in Arlington, and to keep up with increasing demand Via has added a few contract drivers with their personal vehicles to the fleet of Mercedes-Benz Metris vans. These contract drivers are used only if Via does not have enough Metris vans to meet demand. Contract drivers are more like Uber/Lyft drivers who operate their personal vehicles to provide on-demand service to riders on the Via platform. Drivers for the Metris vans and privately-owned vehicles are contracted and go through a rigorous registration process, background checks, and drug and alcohol screening to meet city and state requirements.

Via service in Arlington is available between 6 a.m. and 9 p.m. Monday through Friday, and between 9 a.m. and 9 p.m. Saturday. Passengers can book a Via trip on a six-seat Mercedes-Benz vehicle by providing their pick-up and drop-off locations using the free Via app (Figure 5.7). The Via vehicle will pick them up within a block or two of their doorstep with an average wait time of 10-12 minutes. Unlike traditional ridesourcing services, Via service in Arlington offers a flat fee of $3 per trip. Further, Arlington's Handitran, which is an already-existing door-to-door transportation service for the elderly and persons with disabilities, is still available to users. Via also operates two of Handitran's paratransit wheelchair accessible vehicles in Arlington to provide on-demand wheelchair ridesourcing trips. Via's wheelchair accessible vehicles will pick up customers at their doorsteps as needed. Drivers for the two wheelchair accessible vehicles are

Handitran employees who operate on the Via platform, and go through the registration and background check process like other Via drivers.

During the first year of operation, Via's ridership demand exceeded the city's expectations and a major expansion of service area was made in September 2018. The service area in January 2018 covered approximately 13 percent of the city, and the September 2018 expansion nearly doubled this coverage. Every time the service area is expanded, demand for the service increased exponentially, demonstrating the service's popularity. Three more Metris vehicles were added in September 2018 to meet the increased demand from the service area expansion. As of March 2019, the Via service area covers about 25 square miles. This area includes about 120,000 residents and about 80,000 jobs.

Figure 5.6: Mercedes-Benz Metrics Vehicles Used for Via Microtransit Service in Arlington, TX.

Source: City of Arlington (*67*).

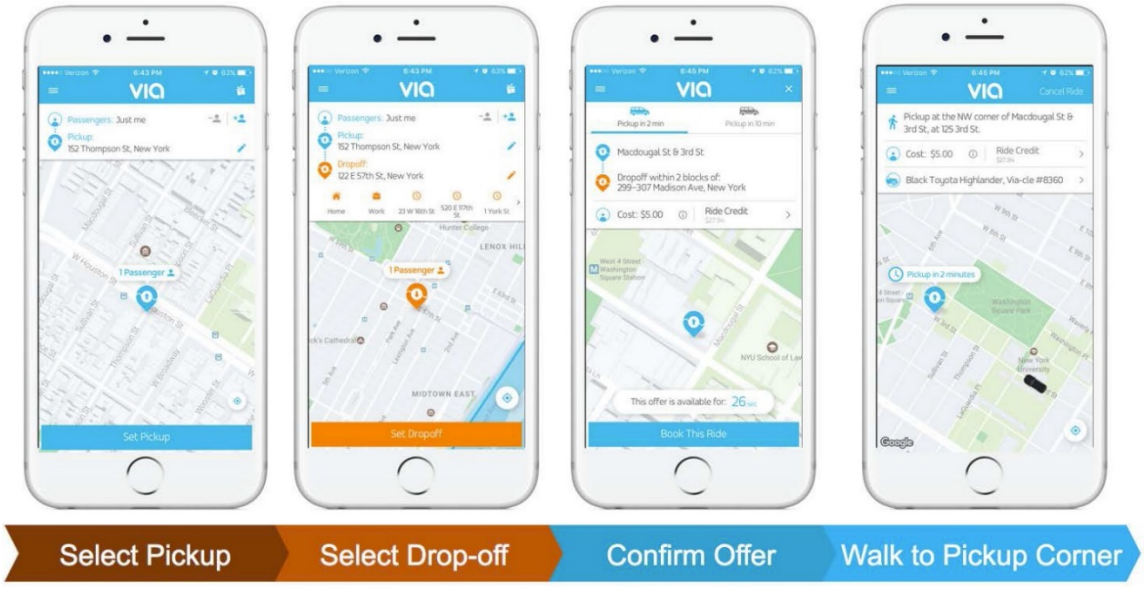

Figure 5.7: Via Microtransit User Interface and Steps to Access a Ride.

Source: City of Arlington (*67*).

Outcomes

Previous microtransit providers such as Bridj and Chariot more or less followed fixed-route operations in the United States and have either ceased operations or faced problems. In contrast, the Via microtransit service in Arlington operates with a fully dynamic and on-demand platform, allowing users to go from anywhere to anywhere within the city's coverage zone. Further, the service is provided at an affordable rate of $3 per trip through subsidies with public tax dollars and federal grants. These features have helped Via microtransit service in Arlington succeed and produce an exponential increase in ridership.

As of March, 2019, Via service in Arlington has provided more than 137,000 rides since its launch. The average number of rides per weekday is about 600, and the average number of rides on Saturdays is approximately 350. About 63 percent of the rides provided were shared rides, more than 70 percent of rides were from repeat customers, and more than 50 percent of the rides were from riders with weekly passes. The customer satisfaction rate for Via microtransit operations was observed as 97 percent. In the first year of Via operation in Arlington, daily ridership doubled when compared to previous MAX fixed-route service. More than 14,000 Via accounts were created by users to use the microtransit service.

To meet the service demand and increased driver hours for conducting operations, the contract budget for the second year was set at $2.1 million, with $800,000 of the budget amount coming from FTA JARC funds, $300,000 from fare revenues, and about $1 million from the city's general budget. When the contract budget was increased for the second year of operations, the city was able to leverage additional FTA funds.

The City of Arlington plans for one more phase of service area expansion in its second year of operations by adding two more Metris vans for a total of 15 Metris microtransit vans. The city also plans to keep a $3 flat fare for future operations.

Case Study 6: Non-Emergency Medical Transport and Lyft Partnerships

The ridesourcing company, Lyft, has entered into a number of partnerships with non-emergency medical transport (NEMT) agencies to provide low-cost and convenient transportation services for residents in rural areas to access medical appointments and services in a number of states across the county.

Program Background

For vulnerable populations such as the elderly and the disabled, finding reliable and affordable transportation to medical appointments can often be a critical impediment to accessing the care that they need. Studies have shown that patient "no-shows" at both community and research hospitals are significant, and have consequences not only for the care received by patients that cannot attend their appointments, but also for the cost of care that all patients at a facility receive.

Many patients with mobility challenges rely on non-emergency medical transport (NEMT) agencies to reach their medical appointments. These services, sometimes paid for by Medicaid or through partnerships with hospitals or medical service providers, are often frustrating for patients and not cost-effective. Wait times can be long and the reservation processes inconvenient. In response to these issues, NEMT agencies and medical service providers have forged partnerships with ridesourcing companies to offer more affordable and convenient transportation options to patients.

Lyft is perhaps the leading ridesourcing company in the arena of NEMT, having partnered with a range of transportation, healthcare, and health insurance providers. In 2017, Lyft partnered with American Medical Response (AMR), the largest provider of medical transportation in the United States, to allow patients to use the Lyft platform to schedule rides to medical appointments. Since then, Lyft has forged partnerships with health insurers Blue Cross Blue Shield and Humana, as well as several NEMT providers including Logisticare and Circulation.

Case Study Facts

Summary

The ridesourcing company, Lyft, has created partnerships with non-emergency medical transportation (NEMT) providers to offer convenient and affordable medical-related transportation to those in need.

Lead Partners

Lyft and NEMT providers and insurers such as Blue Cross Blue Shield, Humana, American Medical Response, and others.

Year Launched

2016

Impact

Reduced wait times, increased on-time performance and cost efficiencies for patients across the United States.

Additionally, several states have recently enacted laws and regulations that allow ridesharing companies such as Lyft to provide NEMT services for enrolled Medicaid recipients. Arizona, Texas, and Florida are among the first states to allow ridesharing as a Medicaid transportation option, providing benefits primarily to rural residents who often lack options for reaching medical appointments (*68*).

Program Specifics

Lyft's partnerships with NEMT providers have resulted in hundreds of thousands of rides across nearly all states. After six months of an NEMT partnership between Lyft and Cigna-HealthSpring insurance, 14,500 rides were reported with satisfaction rates above 90 percent. Indeed, several evaluations of Lyft-NEMT partnership programs show that patient satisfaction is a key driver of success. Lyft's user platform and ridesourcing model has shown the ability to achieve lower wait times, an increase in on-time performance, and cost efficiencies. Because Lyft vehicles cannot accommodate patients with wheelchairs, traditional NEMT service providers still have a role to play in the market, but the Lyft partnerships are showing how mobility innovations can improve transportation outcomes for all types of trips.

Case Study 7: Allen County, Kansas Bikeshare

The Allen County, Kansas, Bikeshare program is a "library model" that offers free bikes to participating members at seven locations in multiple towns within the county, proving that affordable bikeshare systems can succeed in rural areas.

Program Background

Often, traditional bikesharing systems are very expensive for rural community implementation. Therefore, low-cost bikesharing systems are some of the prominent initial implementations observed in rural communities. In Allen County, KS, a rural community has demonstrated that an affordable bikeshare program can succeed by providing free rentals to community residents.

The Allen County bikeshare program was started, and is administered by, Thrive Allen County, a rural health advocacy organization. The program was started in May 2017 with 5 bikes. As of November 2019, the system had 40 bikes, and two tricycles (for people who aren't comfortable with bicycles). During the initial two and half years of operations, the program has secured multiple grants to continue its operations and outreach; all grants secured were associated with healthy communities' initiatives. The program started with a small Blue Cross Blue Shield health initiative grant for its first year operations, followed by a grant from Health Forward Foundation in Kansas City (*69*).

Case Study Facts

Summary

A bikeshare program in Kansas offers bike access to rural community residents.

Lead Agency

Thrive Allen County.

Supporting Agencies

Blue Cross Blue Shield of Kansas, and Health Forward Foundation

Year Launched

2017

Impact

Close to 2000 free bike checkouts from May 2017 till November 2019. Multiple library model systems created through mentoring, and outreach in the US.

Program Specifics

Communities in Allen county did not have public transportation service, and residents in the county lack transportation options to get to work, healthcare facilities, the grocery store, or elsewhere in the community. Because the county has a built environment to facilitate bicycling, a low-cost bikesharing program that is referred to as a "library model" is created in the community to provide free bike checkouts for rural community residents. To make the program affordable for the county, the system is equipped with single-speed cruiser bikes costing approximately

$400 each, uses regular bike racks as stations (or uses existing bike racks if available), and uses bike locks to secure the bikes to bike racks (refer Figure 5.8).

The bikeshare system had seven stations in multiple towns across the county. Bike stations are typically located near facilities such as an office, library, business, etc., Bike checkouts at stations near these facilities are administered by a representative at the facility who volunteers to perform check-out, check-in, and maintain records of bike rentals on Google Docs. Representatives at the bikeshare stations interact face-to-face with patrons to verify their picture ID, and request a signed waiver form before checking-out a bike. Bike checkouts are free, and bikes may be checked out for different periods of time ranging from minutes to months. Maintenance and other assistance with the bikes in the system are performed by a volunteer in the community.

Figure 5.8: Bikeshare Stations in the Allen County Library Model System.

Source: Thrive Allen County (*69*).

Outcomes

Since the launch of the program, the system has had close to 2,000 checkouts: 312 from May to December 2017, 775 in 2018, and 855 checkouts from January to November 2019. Because the program was a success and checkouts were observed to increase overtime, program administrators were working on plans to expand the program by adding more stations at new locations within the county. In addition to administering this program, Thrive Allen County also received a grant to mentor other rural communities in Kansas that want to set up low-cost bikeshare systems in their communities. As a part of this grant, Thrive Allen County helped five rural communities in Kansas (Atchison, Leoti, Lakin, Chantute, and Newkirk) to set up low-cost bikeshare programs, and is actively working with four more communities (Rachter, Ottowa, Hiawatch, and Colby) in Kansas (*69*). Following the success of library model bikeshare program, several rural communities in other US states have also implemented this model.

Case Study 8: Pennsylvania Vanpool Incentive Program

The Pennsylvania Department of Transportation (PennDOT) launched the Pennsylvania Vanpool Incentive Program (PVIP) in 2018 to provide an economic incentive to create new vanpools and ultimately an affordable commuting option for workers across the state. PVIP launched with an initial allocation of $1 million from PennDOT and has created several partnerships with private companies and transit agencies to operate the vanpools. The program has expanded the availability of vanpool options and reduced the cost for vanpool commuters. PVIP has supported the creation of approximately 75 vanpools, with the potential to create more in the years ahead.

Program Background

PVIP emerged out of a desire to address the commuting challenges that exist in mostly rural areas of Pennsylvania with a state-level solution that embraces the flexibility and popularity of vanpools. Vanpools operate in cities and towns across the country and began as a way to defray commuting costs for employees that commute long distances to a central place of employment. The way that vanpools typically work is:

1. Five or more riders (typically co-workers) form a vanpool.
2. The group determines a convenient meeting time and number of pick-up points along the way.
3. Unlike the ride-hailing business model—Uber or Lyft, for example—vanpool drivers are unpaid volunteers. In many cases, vanpool participants volunteer and take turns driving.

Vanpools provide benefits in the form of reduced commuting costs for participants along with reduced congestion along commuter corridors. They can serve as a complement to local or regional transit networks by providing shared commuter service to large employment centers (such as factories or other industrial plants) that may have significant peak-period trip demand, but otherwise would not support dedicated transit service.

Case Study Facts

Summary

The Pennsylvania Vanpool Incentive Program provides grant funds to private and public partners throughout the state to subsidize the costs of establishing new commuter vanpool programs.

Lead Agency

Pennsylvania Department of Transportation (PennDOT)

Supporting Agencies

Private and public vanpool operators such as Enterprise Rideshare and Centre Area Transportation Authority

Year Launched

2018

Impact

75 new vanpools created across the state of Pennsylvania

In Pennsylvania, PVIP was launched as a component of Governor Tom Wolf's *Employment First Initiative* as a way to remove transportation barriers to those seeking employment opportunities. Enterprise Rideshare, a division of the Enterprise rental car company that differs from the Enterprise Carshare division, was awarded a $300,000 grant through the PVIP program to create up to 100 vanpools with either 7- or 15-passenger vehicles. A public transit partner, the Centre Area Transportation Authority (CATA), which serves the State College area of central Pennsylvania, received approximately $40,000 to launch seven vanpools.

The program places an emphasis on providing access to people with disabilities and vanpools that are ADA-accessible are offered a more generous subsidy by the PVIP program. Many of the newly-created vanpools serve large federal employment centers in rural areas, such as the Letterkenny Army Depot in Franklin County – a rural area in south-central Pennsylvania.

Program Specifics

PennDOT designed the PVIP program to spur the creation of new van pools with the hope that they would emerge as an attractive option for commuters and, over time, become financially self-sustaining. To that end, PVIP grants only support the creation of new vanpools. The program provides subsidies directly to vanpool users to reimburse them for their costs, up to a maximum amount. Eligible vanpools must have not previously operated to or from the specified destination or origin point, and they also must meet a minimum occupancy percentage. Subsidies for vanpools that are not ADA-compliant decline after the first year, with all funding eliminated after the third year. ADA-compliant vans are not only eligible for additional subsidy, but the subsidy may be provided beyond year three. Table 1 shows the range in monthly subsidies available to vans of varying capacities between years 1 and 4.

Table 5.1: PVIP Funding Levels Under Various Scenarios.

Vanpool Incentive Funding Examples

Van Capacity/Seats	Minimum Riders 60% Capacity	Maximum Monthly Subsidy			
		Year 1	Year 2	Year 3	Year 4 and Beyond
7	5	$400	$320	$160	$ 0
10	6	$500	$400	$200	$ 0
12	8	$700	$560	$280	$ 0
ADA - 12	8	$1,200	$960	$480	$400
15	9	$800	$640	$320	$ 0

Source: PVIP, 2017 (*70*).

Outcomes

The program has already created approximately 75 new vanpools in its first year, and there is interest in additional programs from across the state.

The range of partnerships that the PVIP program has forged by funding transit agencies, metropolitan planning organizations, and private-sector companies such as Enterprise demonstrate how the program allows for flexibility in meeting the needs of communities large and small. For example, grants to Enterprise have supported independent van pools in areas that may lack a dedicated, public-sector transit agency with resources to devote to rural transit service. In other places, such as central Pennsylvania or outside the Philadelphia area, the PVIP program's grants to transit agencies and MPOs show how vanpools can link residents to existing transit networks or fill a gap in regional services.

Chapter 6: Rural Shared-Use Mobility Toolkit

The rural shared-use mobility (SUM) toolkit presented below can inform state DOTs, regional transportation agencies, rural transit agencies, local governments, human service agencies, and other state and local agencies about the various steps and tasks involved for strategically planning to pilot and implement emerging SUM practices in rural communities. Categories of SUM services studied include ridesourcing, carsharing, bikesharing, microtransit, as well as rural mobility as a service (MaaS) platforms. Unmet mobility markets can include the elderly, disabled, veterans, non-emergency medical transportation (NEMT) recipients, low-income individuals, carless residents, and rural residents in general. SUM service categories that are studied to create this toolkit, and therefore could be applicable to services such as ridesourcing (Uber, Lyft, Feonix Mobility Rising, and other transportation network companies [TNCs]), carsharing (Zipcar, Car2go, Enterprise carshare, etc.,), bikesharing, and microtransit. These services are studied along with the existence of traditional rural transit services (such as fixed-route service, ADA complimentary paratransit service, and dial-a-ride demand-response service) and specialized transportation services (such as volunteer driver programs, NEMT services, veteran's transportation services, and other human service transportation services) in rural areas. MaaS platforms are also studied in rural areas where the platform can integrate and leverage existing rural public transit, and/or specialized transportation assets and services, and potentially add new SUM services to operate alongside them.

The rural SUM toolkit presents five tasks that stakeholders from rural areas in the United States can undertake to understand the opportunities and challenges of SUM services for their rural communities. These tasks will also be helpful in strategically planning, piloting, and implementing relevant SUM services to meet the unique transportation needs for their rural communities. While the order of tasks presented in the toolkit is a suggested method of approach for evaluating and planning potential rural SUM services, these tasks do not necessarily have to be followed as presented. They should be used as guiding principles to help implement SUM services in rural areas (population < 50,000). Further, SUM practices studied in this research also include small urban areas (population 50,000 – 200,000), and in some instances urban areas with a population of greater than 200,000. Therefore, this rural SUM toolkit can also be applicable for small urban communities to plan, pilot, and implement relevant SUM services.

To validate the rural toolkit, a focus group was convened with 16 experts in transit and SUM. Rural transit and transportation representatives from various state DOTs across the country, SUM experts, and representatives from organizations such as CTAA, the Shared Use Mobility Center (SUMC), and the Transportation Sustainability Research Center (TSRC) participated in the focus group. A draft rural SUM toolkit was presented to focus group participants to gather feedback, suggestions, and modifications.

Task 1: Identify Mobility Gaps and Determine Service Needs

Gather Input from Citizens and Community Representatives

Input on mobility gaps, barriers for transportation, and the efficiency of existing rural transit services and/or other specialized transportation services can be gathered from existing transit/transportation service providers and recipients, local governments, mobility managers, human service agencies, healthcare providers, local employment firms/companies, and other businesses whose clients rely on affordable transit/transportation services.

Leadership from Community Partners

Representatives from state DOTs, regional transportation providers, rural transit agencies, local governments, human service agencies, healthcare organizations, workforce/economic development organizations, and other state/local agencies should consider forming a planning committee or advisory group to identify rural transportation needs, existing barriers, and mobility gaps across the state, and within rural communities and counties. A planning committee or advisory group can follow a strategic planning process to address the identified rural transportation challenges by proposing recommendations and action plans. To successfully facilitate the planning committee or advisory group meetings, and to implement action plans, leadership from a community champion is critical. A community champion can be an individual/entity from one of the above-mentioned organizations who understands the rural community, its population, and its transportation needs, and has the determination to bring various transportation stakeholders and community representatives together to resolve their rural transportation challenges with innovative ideas. A community champion and a lead organization should be identified in this task to lead strategic planning process, help identify use cases, and potentially plan relevant SUM implementation.

Preliminary Partnerships

Support of state, regional, and local partners is important for proposing, planning, and implementing innovative technology-enabled transportation services such as SUM services. Rural communities/counties can have preliminary partnerships with organizations such as state DOTs, regional transportation providers, rural transit providers, local government agencies, human service agencies, healthcare organizations, economic/workforce development agencies, local employers, etc., to facilitate potential SUM service planning and implementation. Preliminary partnerships usually include public organizations, but may include private partners. Organizations forming preliminary partnerships for potential rural SUM implementations can engage in one or more of the following tasks to support them:

1) lead a strategic planning process to help identify recommendations and action plans
2) participate in and contribute to planning innovative transportation services that address identified rural transportation needs
3) help identify mobility needs of transportation disadvantaged, elderly, disabled, veterans, refugees, and the general public
4) propose and suggest appropriate implementations for SUM solutions
5) propose SUM service providers that can operate or build a rural SUM service model that meets the unique needs of rural community

6) fully or partially fund rural SUM initiatives with appropriate grants or subsidies to provide affordable transportation services

Task 2: Determine the SUM Category that Best Suits Rural Community Needs

Some rural communities already have rural public transit and/or specialized transportation services while other rural communities have no or very few transit or specialized services. Even if there are services, transportation barriers and mobility gaps might still exist because these transportation services are often not flexible, require trip planning well ahead of the needed time to travel, may only be available to eligible populations (senior, disabled, veterans, and/or NEMT recipients). In addition, operations may be confined to limited service coverage areas and frequency. While these traditional rural transit and transportation services provide lifelines to their users, providing reliable transportation services in rural areas remains difficult because of the transportation barriers and challenges posed by limited funding options, low population densities, and long distances.

SUM services provide fast, reliable, flexible, and cost-effective services in most urban communities. This study demonstrated that SUM practices can also be successful in addressing rural transportation challenges. Most initial rural SUM implementations prove that SUM services have the potential to address rural transportation challenges and fill mobility gaps efficiently and cost effectively. However, before deciding on the category of SUM service (ridesourcing, carsharing, bikesharing, microtransit, MaaS, etc.,) that could suit specific rural community needs, communities need to study and identify the existing mobility challenges and build individual use cases that they want SUM service providers to address. SUM agencies that primarily operate in urban areas might not be fully aware of the unique challenges of operating in rural communities. Therefore, rural community representatives should study rural transportation challenges, determine potential rural SUM use cases ahead of time, and then involve SUM agencies in conversations to give them a better perspective on how they can use their platform or business model to address rural community challenges. Categories of SUM services that have the potential to address rural mobility challenges are listed below.

Ridesourcing Services

In rural areas, ridesourcing services have the potential to offer on-demand short-distance trips for the elderly, NEMT recipients, veterans, and the general public. Traditionally these kinds of trips are fulfilled by rural transit and/or other specialized transportation services. Rural areas without existing or with insufficient public transit and/or specialized transportation providers might use ridesourcing service providers to offer on-demand trips to target rider groups by using one of the following models: 1) creating a rural ridesourcing model to provide trips for intended target riders, 2) add ridesourcing services to an already-existing transit/transportation services network to provide first-mile/last-mile connections to increase the use and coverage of available services in rural areas, or 3) provide on-demand ridesourcing trips to target riders to supplement and compliment regular transit/transportation services.

Major TNC providers (Uber/Lyft) have launched services in some rural areas, but many rural communities may not have enough riders to offer a satisfactory demand for drivers. Also, TNC

trips provided in existing rural communities can be expensive. Therefore, TNCs independently launching ridesourcing services in rural communities may not be a sustainable business model. This is because rural communities face unique transportation challenges, and representatives from those rural communities are better able to understand and address those challenges. Therefore, most successful models of providing SUM services have involved rural pubic agencies (transit agencies, local governments, human service agencies, regional transportation providers, etc.) in partnership with ridesourcing providers offering specific kinds of on-demand trips. These services have been integrated into existing transportation networks and rides are often subsidized. Opportunities that rural communities may consider to engage ridesourcing providers in partnerships to address specific transportation challenges and mobility gaps are presented below. One or more of these opportunities may be used to build a rural ridesourcing use case that can address specific rural transportation challenges, as well as help rural communities begin discussions with ridesourcing providers about the feasibility of using their platforms.

Ridesourcing Opportunities for Rural Communities

1) *Ridesourcing service with volunteer drivers:* Offering ridesourcing trips using volunteer drivers can be a feasible and successful business model, especially in rural communities. Many rural communities already have volunteer driver programs to provide specialized transportation services. If those services are not available, a ridesourcing service can be launched by arranging for volunteer drivers. A volunteer driver ridesourcing platform can be used to help: 1) users request and pay for rides using a smartphone app, 2) volunteer drivers receive ride requests on a smartphone app and then coordinate accordingly, and 3) users, drivers, and volunteer program managers perform various trip management activities on smartphone applications and/or web portals.
2) *Contracting drivers:* Most rural public transit riders using dial-a-ride, ADA complimentary paratransit, and NEMT services know the drivers and so they have trust and confidence in accessing these services. Ridesourcing services in rural areas can be operated by hiring dedicated drivers who undergo an interview process, a background check (including alcohol and drug tests), and vehicle inspections if they use their personal vehicles.
3) *Definitive hours of operations:* If rural communities engage ridesourcing agencies to provide a significant portion of their transportation services, they should strive to ensure the service is available for fixed hours of operation during weekdays and weekends so that riders will have a transportation option within a defined minimum response time. Advance reservations for ridesourcing services can also help improve trip planning and dispatch when needed.
4) *Using an existing fleet with a ridesourcing platform:* Ridesourcing providers may not have wheelchair accessible vehicles or provide ADA accessible trips. If existing transportation providers have ADA compliant wheelchair vehicles, they can potentially be used on a ridesourcing platform with contracted drivers to provide on-demand trips.
5) *Subsidized rides:* While ridesourcing trips are fast, flexible, and reliable, one barrier for rural users is expensive fares. Ridesourcing services could provide affordable trips by

subsidizing rides by 1) setting an affordable and fixed fare for rides while the rest of expenses are covered through secured funding/grants, or 2) grant/subsidy covering a certain portion of the fare.

6) *Integrating into a rural transportation network:* If ridesourcing services are added to existing public transit/transportation services to meet certain mobility gaps, the services can be integrated into the transportation network to complement existing services, and supplement them when needed.

Carsharing Services

Carsharing services can meet transportation needs by offering access to an automobile for a short period of time to promote mobility options for residents without vehicles, low-income residents, and for people with a driver's license looking for independent mobility options to drive themselves to grocery stores, medical appointments, etc. While carsharing services are prominent in urban communities, they are almost non-existent in rural communities except for a few university towns and tourist communities. However, when transportation facilities are inadequate or non-existent, and if there is a use case for a carsharing service to potentially meet a specific rural community's mobility needs, carsharing services should be considered on a small scale, even with just a few cars. Rural residents may find the cost for carsharing services expensive (considering signup fee, monthly subscription fee, and rental fee), and carshare service providers may not generate significant revenue from rural operations. However, some initial small-scale subsidized rural carsharing implementations have been successful and have generated revenues at a much higher level than the typical public transit fare box recovery. Some opportunities to promote carshare program when it is appropriate for rural communities include:

1) *Subsidized carshare program:* Subsidize a carshare program by waiving certain user costs (sign-up fee, membership fee, etc.,) and subsidize hourly rates to make the carshare program affordable and attractive for rural residents.
2) *Operational carshare program regardless of demand:* Guarantee a monthly minimum payment for carshare service providers regardless of usage so they can generate sufficient revenue to keep the services operational.
3) *Engage community partners:* Partner with local agencies and/or businesses to a) rent/accept parking spots in parking lots/facilities to park carshare vehicles in strategic locations in the community to attract users, b) set-up kiosks for users without access to smartphones or computers to create user accounts and make reservations, c) generate payroll debit cards or other relevant strategies for users without bank accounts to help pay for and use the carshare service, and d) perform regular maintenance activities.

Bikesharing Services

Bikesharing services in rural communities can address transportation needs to promote active transportation options for the health and wellness of users; provide affordable transportation options for making short distance trips within the community; and expand the service area of an existing bus system by serving first mile/last mile trips, and connecting multiple frequent destinations. Apart from traditional funding sources, specific funding sources that can assist with rural bikeshare program can include state/local healthcare organizations, local bicycle shops, and

other local partners. Based on the availability of grants and funding, various categories of bikeshare services can be planned. While urban bikeshare business models can be expensive with high startup costs, low-cost bikeshare business models can better cater to demand in rural communities with lower budgets.

Of course, it is critical to have the necessary built environment in rural communities to facilitate bicycling. This environment includes bike paths, routes, signs, and other needed infrastructure for safe and successful bikeshare operations. Otherwise, costs associated with setting up the needed infrastructure to facilitate bicycling would need to be considered for planning bikeshare operations, and these can be prohibitive. Apart from providing traditional cruiser bikes in the bikeshare program, accessible bikes such as hand operated bikes, tricycles, and side-by-side tandem bikes may be added to the program to meet the needs of potential users.

Traditional bikeshare systems that exist in larger cities and are provided by agencies such as Motivate, B-Cycle, etc. require a high startup cost for purchasing bikes, setting up stations, building other needed infrastructure, and employing support staff. High levels of ridership to pay for the system and its operations is required, conditions which are not typically found in rural areas. Based on the identified mobility needs, and availability of grants/funding, however, various types of bikeshare systems could be feasible in rural communities where trip lengths are not excessive and connectivity to other transportation services for longer trip distances is good:

1) *Low-cost bikesharing system:* These operations can better suit rural communities as they could be feasible with comparatively lower budgets. The bikes, bike racks, and other needed infrastructure is built to a modest quality to make the program economical and attractive. Some of the low-cost bikesharing systems that are studied in this research effort include Zagster, Motivate, etc.
2) *Library Model:* In this system, bikes could be made available for checkout for free in local libraries just like checking out a book or movie. The library bikeshare model is very successful in rural communities as it is convenient and accessible to low-income individuals, and it could effectively make use of already-existing institutions/community resources. While this model is very inexpensive, some grant funding is needed to purchase inexpensive bicycles and perform needed maintenance. Partners such as local bike shops, community volunteers, etc., can support this implementation by maintaining bikes in the system and by advocating for bicycling and active transportation options for health and wellbeing of their rural community.
3) *Community bike donations model:* When there is a need for bikesharing services in a rural community, and if there are no sufficient funds and/or facilities available for setting up any of the above three bikeshare systems, a bikeshare program can still be implemented by securing donated bicycles and making them available in multiple locations. However, small grants and help from volunteers may be needed for keeping the bikeshare program operational.

Microtransit Services

While some initial microtransit services implementations have been unsuccessful, SUM providers such as Via Transportation, Inc., have been offering dynamic and on-demand pooled

transportation services using vans in larger urban areas. Microtransit services have also been successfully deployed in the smaller community of Arlington, TX, where the service has essentially replaced the city's existing public transit system and achieved a 97 percent customer satisfaction rate. While Via is not currently operating in rural communities, interviews conducted with the company's management suggest that their platform is applicable for rural use cases, opening up potential opportunities for rural communities willing to implement microtransit services. Other microtransit service providers may offer dynamic or fixed-route on-demand service to provide private transit services. Fares for microtransit services are traditionally more expensive than fares for traditional public transit services. However, microtransit services can be made attractive and affordable in rural communities by subsidizing the fares. While current microtransit services currently operating in the United States do not operate wheelchair accessible vehicles, their platform can be used on already-existing or other wheelchair accessible vehicles to provide trips for riders with disabilities.

Rural Mobility-as-a-Service

Mobility as a service (MaaS) platforms for rural communities can integrate already existing public transit services, volunteer driver programs, and other specialized transportation services onto one platform so target users and rural residents can access information about various services based on their eligibility; make trip reservations; and pay for the trip, all at one place. Further, if a rural agency decides to implement a specific category of SUM service such as ridesourcing or a carsharing service along with building a MaaS platform, additional SUM services can also be included as transportation options alongside other transit and transportation services. A centralized list of all available transit/transportation services can also be useful for transit agencies, mobility managers, volunteer program managers, and other transportation providers to better manage their services and assets. Rural MaaS platform can also potentially integrate multiple transit/transportation providers within a county or among adjacent counties. Some of the opportunities for implementing rural MaaS platform are summarized below.

1. *One-stop shop:* As described above, all available transportation services can be listed on a single platform to determine eligibility and information for various transportation services. MaaS platform can be accessed as a smartphone application and/or as a web portal. Features could be added to the MaaS platform to enable making reservations, producing itineraries, requesting and paying for rides, and enabling trip management. Accessing a rural MaaS platform via a smartphone application and online portal can significantly reduce the effort needed by users to schedule rides.
2. *Additional SUM services:* Apart from developing rural MaaS platform to better manage existing transit/transportation assets and services, more rural SUM implementations can also be considered to meet any existing mobility gaps. These additional rural SUM services can be added to a rural MaaS platform alongside other existing transit/transportation services with features including making reservations and managing and paying for trips.
3. *Setup alerts and reminders:* Some common issues with providing healthcare trips and other categories of trips include trip cancellations and no-shows. These trips, which may be made through volunteer driver programs or other specialized transportation services,

have to be reserved ahead of time and riders often forget or lose track of their reservations resulting in trip cancellations or no-shows. A rural MaaS platform can resolve these issues by including these transportation services in its platform with features to generate alerts and multiple reminders to the rider after making the reservation and before the trip, as well as providing alerts and reminders to destination contacts if needed.

4. *Manage volunteer driver programs:* Volunteer driver programs are traditionally managed through excel sheets, or third party software which can often present issues with coordinating drivers and occasionally create trip duplications when requests are received from different service providers. Rural MaaS platforms can present an opportunity to effectively manage and coordinate volunteer driver programs.
5. *Interoperability:* Rural transit agencies in adjacent rural communities or counties often have their own unique operational structure and dispatch software. To facilitate travel across rural communities or counties, riders often have to plan and make reservations with multiple transit/transportation providers as individual rural transit agencies do not communicate with each other. A rural MaaS framework can be used to list available transportation services among adjacent rural communities or counties, and can potentially integrate the MaaS framework with individual transit agency software so riders can make a single trip request to travel across rural communities or counties. The MaaS platform can facilitate reservations and gather confirmations from each individual transit/transportation provider.

Task 3: Establish Partnerships

Developing public private partnerships is a critical step in the rural SUM toolkit and in rural SUM implementations because service providers are needed to provide technology, software, and mobility platforms to address rural areas' unique transportation challenges.

It is important to inform SUM service providers about rural community characteristics, travel markets, existing complementary services, and identified challenges so they can determine an effective business model for specific rural SUM operations to meet transportation needs, but that do not duplicate already-existing services.

Once rural transportation challenges and potential rural SUM use cases are identified, the agency leading the potential rural SUM implementation effort, along with other public partners, should begin exploring opportunities with SUM service providers in the SUM category that best fits the use cases. Ideally, communities can begin to look for SUM providers that previously operated in rural or small communities so the service providers already know their platform's applicability for use cases in rural communities. For example, if a rural community is looking for ridesourcing services, they can consider agencies such as Feonix Mobility Rising, RubyRide, Lyft, Uber, etc.,

SUM service providers are more motivated to partner with public agencies that are excited and determined to improve their community's transportation challenges using technology and that are open to the idea of learning from challenges or mistakes while conducting pilot operations. It

is important to inform SUM service providers about rural community characteristics, existing services, identified challenges, service needs, and potential rural SUM use cases, so they can determine if their existing business model or a modified version of their business model could be applicable for providing rural SUM services and not duplicate already-existing services. SUM service providers can also be attracted by requesting proposal and qualifications for potential rural SUM implementation projects through grants from state DOTs, transit agencies, and other agencies.

Similarly, it is very important for public partners to identify data reporting needs from SUM providers before partnering with them. If SUM services are funded from a grant through a particular agency, the funding agency might need specific data reporting such as operational performance, trips provided, impacts, etc., For example, if a rural SUM implementation is funded by FTA, it is important to check with FTA about data that needs to be reported for potential inclusion in National Transit Database or for other purposes. Sponsoring public agencies should be cognizant of the data to be collected from a potential SUM implementation and make sure the potential SUM agency will agree to data sharing requirements. If the partnership is not able to provide the data to measure the performance or impact of the project to meet the problem statement, it is not a partnership worth pursuing. A recent *TCRP Report 204: Transit Agency & TNC Partnerships* study has produced guidance for transit agencies and other public agencies to make informed decisions on where, when, and how partnerships between transit agencies and TNCs can be considered. While this study primarily focused on larger transit systems and their partnerships with TNCs, guidance and lessons learned can still be applicable for rural communities. This report can be used by rural transit agencies or other agencies leading potential rural SUM implementations to gather guidance about public private partnerships.

Apart from SUM service providers, other potential private partners that can engage in rural SUM implementations include local employers, healthcare organizations, business owners, etc., who either share a similar vision or may benefit from potential SUM operations.

Task 4: Evaluate Challenges, Accessibility, and Impacts

At this stage, the lead agency and other partnering rural agencies should have knowledge about the category of SUM service for their community and the SUM provider that can effectively address their rural transportation challenges. Both public and private partners involved in a rural SUM feasibility effort can plan for potential implementations, characterize operational specifics, identify obstacles/challenges and address them accordingly, and determine potential impacts and outcomes from proposed operations. Some of the common challenges, accessibility concerns, and impacts to monitor are summarized below.

Challenges

- *Limited funding availability:* One of the major obstacles for providing adequate traditional rural transit and other transportation services is the availability of funding to support its costs. Attaining funding for piloting and/or implementing one or more unconventional SUM practices that may suit a particular rural community can be challenging. Unlike in urban areas where there is heavy demand for SUM services, the demand for SUM services in rural areas may not be strong enough to sustain them.

Therefore, these rural SUM implementations may need to be supported by funding or grants that can at least partially support the operational costs for SUM providers so that they can provide affordable trips and services to target riders or rural residents in general.

- *Low demand:* While an identified category of SUM service can potentially address rural transportation challenges and fill mobility gaps, demand for services may be low. Rural communities and SUM providers can determine opportunities for operations during low demand hours or days. A comprehensive list of opportunities gathered from initial rural SUM implementations were summarized in Task 2 of this toolkit.
- *Gaining trust:* The success or failure of a new SUM service within a rural community is dependent upon building the trust of riders. Trust is especially important with ridesourcing services and their drivers. Traditional transportation service recipients such as the elderly, NEMT recipients, veterans, and other transportation disadvantaged populations often know their drivers, communicate with them, and receive necessary assistance for their trips. Ridesourcing services that supplement these trips can have contracted drivers that may be unknown to riders.
- *Broadband coverage:* All SUM practices heavily rely on sufficient strength and coverage of internet service throughout the rural SUM operational area. This service is required to support the smartphone applications used to make reservations, to request, manage, and pay for rides and trips, and to receive notifications and alerts. Some rural communities may lack adequate internet coverage to facilitate SUM services.
- *ADA accessible vehicles:* SUM service categories such as ridesourcing, and microtransit services may not have vehicles that are wheelchair accessible. However, if ridesourcing services are contracted to provide paratransit or NEMT trips, accommodating riders with wheelchair access is important. Rural communities and SUM providers should devise strategies to accommodate accessible trips using wheelchair accessible vehicles, engage transportation providers with wheelchair accessible vehicles to provide these trips, or use wheelchair accessible vehicles from rural transit agencies or other agencies to provide on-demand trips using their ridesourcing platform.
- *Access to smartphones:* Rural transit users who are predominantly low-income individuals, elderly, or disabled may not have access to smartphones or computers. Therefore, it is impossible for them to request and manage rides if SUM services are solely managed using smartphone apps and/or web portals. Consequently, it is important to also have a telephone support line to make reservations, pay for trips, and dispatch SUM services.
- *Bank accounts:* Some rural residents and potential SUM users do not have credit cards, debit cards, or bank accounts to provide payments for SUM services. Strategies to allow payment options for individuals without bank accounts should be devised. Some practices include setting up payroll debit cards, prepaid cash cards, etc.

Benchmarks

As a part of planning rural SUM practices for potential rural implementations, public and private partners should identify the potential impacts of implementing SUM practices in rural communities. Those impacts may include: 1) goals for SUM services in terms of enhancing

mobility, 2) number of users enrolled in the program over time, 3) trips provided and targeted growth in trips within a certain timeframe, 4) actual cost per trip, 5) customer satisfaction with services, 5) reduced no-shows and/or trip cancellations compared to previous services. These impacts can help set goals for potential rural SUM operations and can also be used to provide a strong case to secure sustainable funding.

Task 5: Funding and Implementation

Funding

As acknowledged in most of the previous rural SUM toolkit tasks, availability of funds/grants is essential for piloting/implementing rural SUM services. Funding assistance would primarily be used for providing SUM operations in rural communities and for subsidizing the trips/services to provide affordable, flexible, on-demand, and reliable transportation options for users. Similar to traditional transit services and other specialized transportation services receiving funds from various sources, financial support is critical for rural SUM implementations. Funding needs vary by SUM service category. Rural ridesourcing services may need greater assistance from federal, state, or local governments compared to rural bikesharing services that may only need limited support that can be secured from local sponsors. While traditional public transit services and other specialized transportation services receive federal, state, and local funds for capital needs, most SUM practices are capital-light business models, and benefit more from assistance for operational expenses. Some opportunities to fund rural SUM practices are summarized below.

- ***FTA Formula Funding (Section 5310 & 5311):*** Most rural transit services receive capital, planning, and operating funding assistance from FTA's Section 5310 Enhanced Mobility of Seniors and Individuals with Disabilities and Section 5311 Rural Transit formula grants via their state DOTs. These funds help provide rural transit services such as fixed-route, dial-a-ride, and complimentary paratransit services based on mobility needs. Section 5311 formula funds can also be used to support emerging SUM services as long as the SUM service meets the legal definition of public transportation (49 U.S.C. § 5302) that provides shared-ride services to the general public. Exclusive-ride services provided by some SUM operators (such as ridesourcing) may be eligible to be supported by Section 5310 formula funds as ADA paratransit, as a job access and reverse commute project, or as an alternative to public transportation. While FTA formula funding can support some SUM services, SUM service providers are typically not eligible to be the recipients or subrecipients of these grants. States, local, or regional public agencies are eligible to be recipients or subrecipients of FTA formula funds. FTA grant recipients or subrecipients can enter into contracts with SUM providers as third-party contractors to provide expanded public transportation services, or alternatives to public transportation services. FTA recipients or subrecipients entering into contracts with SUM providers must ensure that civil rights obligations are met as noted in the ADA Act. More information about eligibility of SUM services under FTA grants, ADA requirements with SUM operations, and drug and alcohol testing requirements with SUM operations are provided as frequently asked questions and corresponding responses by FTA in Appendix B, Appendix C, and Appendix D. Ridesourcing services may not receive Section 5311 funds through eligible recipients/subrecipients as they are not considered public

transportation that provide shared-ride services. However, ridesourcing services can receive support from FTA through recipients/subrecipients if they provide exclusive-ride services for the Section 5310 program, or as job access and reverse commute projects. Microtransit services and ride-splitting services are generally eligible to be supported by FTA Section 5311 funds through recipients/subrecipients as they would be considered a public transportation service providing shared-ride services. If these services do not meet the definition of public transportation services, they may be eligible for Section 5310 funds through recipients/subrecipients. An FTA grant recipient may also have scope to work on a capital project by integrating transit services with microtransit operations. Vanpool, a type of ridesharing service, is considered a form of public transportation, and is eligible for capital or operating funds under FTA's grant programs through eligible recipients/subrecipients. Bikesharing stations and infrastructure is considered an eligible expense to be supported by FTA's grant programs through recipients/subrecipients as they are considered functionally related to transit when they are located within a three-mile radius of a transit station or bus stop. However, purchasing of bikes for the bike sharing program is not considered an eligible expense because federal public transportation law does not define bikesharing itself as a form of public transportation. Similarly, carsharing is also not defined as a form of public transportation by federal public transportation law, and therefore FTA's grant programs cannot be used to operate these services. However, carsharing is considered as functionally related to transit, and therefore carsharing facilities such as dedicated parking spaces at local transit stops are eligible to be supported by FTA's grant programs through recipients/subrecipients. Further, other ways transit agencies can support SUM services using FTA's grant programs include providing additional mobility options to the public by undertaking partnerships/contracts with other mobility providers. Partnership activities to enhance mobility options include mobility management; joint marketing; advertising; integration of schedules or travel information systems; linking to services from internet sites; integrated payment systems; etc.

- ***Mobility on Demand (MOD) Grants***: In 2016, FTA's MOD initiative funded 11 MOD sandbox projects to demonstrate public transit integration with SUM services. Potential funding opportunities from future FTA MOD initiatives could be explored to fund innovative rural SUM implementations to address rural transportation issues.
- ***State DOT Funding:*** In addition to FTA formula funding, several state DOTs also have dedicated transit funding to support rural transit operations. Mobility managers for rural communities can explore potential opportunities with DOT representatives to support innovative technology-enabled transportation services that have the potential to better fill rural mobility gaps through proactive public-private partnerships. Some state DOTs have also launched statewide initiatives that dedicate significant funding to innovative ways to enhance mobility in rural and suburban communities; fill mobility gaps for transportation disadvantaged population such as the elderly, disabled, veterans, low-income individuals, etc.; and provide reliable transportation to healthcare services and employment opportunities, etc.,

- ***Other National, State, and Local Grants:*** When rural SUM implementations involve providing transportation services for target populations such as those needing ADA paratransit services, NEMT recipients, veterans, or rural residents in general, rural communities could explore grant funding opportunities from other national or state agencies, regional transportation providers, local governments, transit agencies, human service agencies, and other agencies. Medicaid's NEMT program and veteran's transportation services receive dedicated funding for providing much-needed transportation for recipients. Rural communities along with SUM providers can explore solutions for these service recipients to offset or replace existing traditional services with a more efficient SUM service model. Grant funding opportunities are also available through FTA's technical assistance centers: National Center for Mobility Management (NCMM), and National Aging and Disability Transportation Center (NADTS). These centers support and promote mobility of people with disabilities, older adults, and those of lower incomes. Federal agencies that provided funding for transit agencies in the past could be potential candidates to request funding for rural SUM implementations. These federal agencies include the US Department of Health and Human Services (HHS), the US Department of Transportation (DOT), the US Department of Housing and Urban Development (HUD), the US Department of Veterans Affairs (VA), the US Social Security Administration (SSA), the US Department of Agriculture (USDA), the US Department of Labor (DOL), and the Corporation for National Community Service (CNCS).
- ***Community Initiatives:*** Unlike expensive and complicated rural ridesourcing or MaaS implementations, rural bikesharing services may need comparatively less funding. That funding can potentially be secured from local governments, local agencies, local businesses, or local sponsors if there is a need for an active transportation service in a rural community to compliment or supplement existing services. Further, an even cheaper rural bikeshare model can also be made available through community coalitions or by setting up a library checkout model when available funding is limited.

Implementation

Once a funding/grant has been secured for rural SUM implementation, depending on having a definitive SUM provider on-board, next steps can be determined. If an agency securing funding and other involved partners have not yet secured a rural SUM service provider that can offer SUM services identified in rural use case, it should reach out to a SUM service provider that they think can effectively meet their rural community's needs. Guidelines provided in Task 3 can be followed for ways to approach relevant SUM providers, and for forming partnerships. Alternatively, rural communities can issue a request for proposal (RFP) describing the community transportation challenges and potential rural SUM use case/cases, to (hopefully) receive multiple creative approaches to choose from. However, if rural communities are in conversations with SUM providers beginning with the planning process, it may be prudent to contract with those providers for offering identified rural SUM services as they have better knowledge and understanding about the community's transportation challenges and needs. Any

procurement using federal funding must follow FTA Circular 4220.1f Third Party Contracting Guidance.

The contract setup process with SUM providers typically occurs over a 6- to 12-month time frame. During this phase, SUM agencies can finalize any undecided operational characteristics, address any lingering challenges/barriers, work towards project setup, lay the groundwork for deploying operations, and invite any additional partners on-board. Further, during this phase public partners and SUM agencies involved can revisit the goals that were identified in Task 4. If a SUM provider was brought on-board at a later stage, public partners can work with that provider to establish relevant goals and impacts to assess the performance of rural SUM implementation.

Rural SUM implementation may start with a 6- to 12-month pilot phase to test-out the finalized rural SUM implementation. If the rural SUM service model is complicated, various stages/features of SUM service can be rolled out in phases throughout the pilot period. After the pilot operational phase is completed, public partners and SUM providers can assess the impacts and performance of the rural SUM operations and determine if they meet the project's initially defined impacts and goals. Based on any challenges faced during the pilot phase, and based on the operational performance of a rural SUM project towards meeting identified goals, modifications can be made to the operational structure or use case to continue rural SUM operations, provided a sustainable funding source is available. Lessons learned from the rural SUM implementation could be useful to deploying similar or efficient rural SUM practices in other rural communities within the county, state, or in the United States.

Marketing and Outreach

After securing funding/grant for rural SUM implementations, it is essential for both public and private partners to conduct marketing and outreach activities. Goals of these activities should be to: 1) inform rural residents and potential riders about upcoming SUM services and local partnerships to increase awareness, 2) rebrand already-existing transit/transportation services if there are service changes, 3) attract potential riders, and 4) hire contract drivers.

Chapter 7: Guidance for State DOTs and Other Agencies to Promote SUM Practices in Rural Areas

Providing adequate funding to meet mobility needs of rural community is always a challenge. While traditional rural public transit services and other specialized transportation services may meet the intended purpose of providing transit/transportation services with the right amount of coverage and frequency, often these services are expensive and some government funding is required to support a significant portion of capital investments and operational expenses for the services to remain affordable for targeted riders. Even with the right amount of service in a rural community, these services may not be flexible enough for riders; require advance planning; and may not be available for everyone. Funding limitations may force state DOTs and other agencies to offer minimal service coverage and frequency. Lower demand and inadequate funding for providing rural transit/transportation services results in rural areas having either only a few days of service per week, a few days of service per month, or sometimes no transportation services at all.

Alternatively, emerging SUM implementations that have proven to be very successful in meeting unique transportation needs in urban communities also have been successful in rural areas through partnerships with rural transit providers or other local agencies. Through these partnerships, SUM implementations provide better coverage with fast, on-demand, and reliable service. Public partners in rural areas working with relevant private SUM providers have demonstrated innovative, cost-effective ways to address rural transportation challenges. For rural communities to proactively partner with private SUM providers to resolve their unique transportation challenges and fill mobility gaps, leadership and sustainable funding are essential. Some ways that state DOTs, and other agencies can promote rural SUM practices are:

Diversify state DOT funding between traditional and SUM services

While state DOTs have dedicated funding to support rural transit/transportation services, only traditional rural transit services or specialized transportation services may be eligible to receive that support. Dedicated and sustainable funding support from state DOTs would play a primary role in encouraging rural areas to explore innovative SUM service models that have great potential to better address some rural transportation needs. Most SUM practices have a funding structure that is capital-light and operationally heavy, resulting in a large share of the contract budget being directed to operating expenses. This situation is a barrier to requesting sufficient grant funding from many traditional funding sources because those sources limit the amount of funds that can be directed to operating expenses. Policy and guidance can be developed to diversify state DOT funding availability between traditional transit/transportation services and innovative rural SUM services contracted through local or regional transportation providers. Further, to encourage rural transit agencies or rural communities/counties to explore innovative transportation solutions, state DOTs can launch specialized grant funding initiatives to attract innovative rural SUM projects that better address rural mobility gaps and enhance transportation to healthcare services, employment opportunities, educational programs, and other critical lifeline facilities.

Importance of FTA formula grants (Section 5310 & 5311), FTA's MOD grants, and state DOT's transit funding

Traditional public transit and transportation services funded by FTA formula grants (5310 & 5311) and state DOTs are intended to fulfill critical rural transportation needs such as ADA complimentary paratransit and other specialized transportation services. Rural SUM implementations often function well in parallel with existing traditional services to supplement and compliment those services and fill any mobility gaps. Traditional rural public transit and transportation services can also leverage their expertise, assets, and services to partner with SUM providers to build effective rural transportation networks.

Further, FTA's MOD grant initiative focuses specifically on exploring innovative transportation solutions in rural communities and can provide significant help to rural areas across the nation to help build effective rural transportation networks using efficient SUM business models.

Create a one-stop learning platform about rural transportation challenges, and SUM opportunities

Many SUM providers who have their primary operations in urban areas lack knowledge about rural transportation and rural residents' mobility needs, and challenges. These knowledge barriers often hinder SUM providers from understanding rural markets and building business models that accommodate rural market applications. Similarly, public agencies in rural areas such as transit providers, local governments, regional transportation providers, and human service agencies lack knowledge about innovative and cost-effective SUM services that can potentially address mobility gaps. To promote awareness and opportunities for rural SUM implementations and public-private partnerships in rural areas, organizations such as FTA, state DOTs, APTA, CTAA, national rural transit assistance program (National RTAP), and national center for mobility management (NCMM) can develop a one-stop website, webinars, and training programs to promote exposure and opportunities for rural pubic agencies and SUM providers to collaborate.

Ensure availability of broadband internet service in rural areas

Strong internet service is central to the existence and operability of any SUM service. While some initial rural SUM implementations in the nation are allowing users to use a phone line to request, pay, and dispatch drivers/services, all of these implementations propose to deploy smartphone applications and/or web portals to help facilitate mobility operations. Rather than serving as the primary means of facilitating interactions with users after launching mobile applications, the call-in option might still be available to accommodate riders who are not technology savvy. Rural communities often lack the strength and/or coverage of internet service needed for efficient SUM service operations, and it is important for state and local governments to address this issue by providing more reliable broadband internet service and coverage to rural communities and counties. This enhanced internet service would help SUM services address rural mobility gaps.

Advocate the significance of transportation towards healthcare and employment in rural communities

Affordable transit/transportation services in rural communities to healthcare facilities, employment centers, educational centers, grocery stores, and other critical services can promote lifeline services and improve the quality of life of rural residents. Grants from national, state, and local healthcare organizations, economic development organizations, and workforce development agencies have supported some of the initial rural SUM implementations. Considering the significance of the support received from these organizations towards effective SUM implementations to help promote their missions, national organizations (such as FTA, APTA, CTAA, National RTAP, NCMM, etc.) can advocate at the federal and state levels to improve the understanding of how innovative SUM practices can improve healthcare, workforce development, and the economy in rural communities. Further, bringing together rural transportation stakeholders and representatives from healthcare and workforce development organizations through state conferences and local meetings can help initiate a discussion on addressing rural transportation issues.

Role of Regional Transportation Agencies

When rural transit agencies and local governments have limited funding options for providing support to rural SUM implementations, regional transportation agencies can strategically fund rural SUM implementations. Lessons learned from those strategically funded implementations can be used for expanding rural SUM service models to other rural communities in their designated service areas.

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Appendix A: Interview Questions for Shared Use Mobility (SUM) Operators in Rural and Small Urban Areas

Objective of the interviews: Interviews will be conducted with contacts from rural areas and small urban areas piloting/implementing emerging SUM practices. Interviews will also be conducted with SUM agency contacts that are not yet operational in rural/small urban areas.

SUM operations in consideration: Ridesourcing, bikesharing, carsharing, and microtransit services. Other potential technology enabled initiatives might be considered.

Interview candidates in the order of importance: SUM agency contacts, SUM stakeholders contacts, city official contacts, transit agency contacts, other relevant contact from the rural community/operating SUM agency.

Process for conducting the interviews: Interview candidates will be contacted via email (if not, by phone), and will be invited to participate in interview, and in the study. If willing, an appointment will be scheduled for a phone interview. If the contact is more comfortable to answer the questions in a word questionnaire form or survey link, these alternative options will also be available to gather the responses from the interviewee.

1. Respondent / Interviewee Information
   Name:
   Title:
   Organization Name:
   City:
   State:
   Website Link:

2. Please briefly describe the shared use mobility (SUM) services that your agency / organization offers.

3. What are some of your rural community's unique characteristics that lend itself to SUM solutions for transportation and transit?

4. Please describe any of the motivations or circumstances that led your agency or organization to launch SUM services in the rural community?

5. What were some of the key challenges that your community or organization faced in launching and operating the SUM service?

6. How did your community or organization seek to address these challenges?

7. What have been some of the key successes of the SUM service in your community?

8. In general, what are some community characteristics that you believe would contribute to a successful SUM approach to transportation and transit in rural areas?

9. Did your SUM operation involve any public / private partnerships? If so, did these partnerships help in the launch or operation of the program? Why or why not?

10. Did the SUM project benefit from any involvement or funding from federal government agencies, State DOTs, local government, transit agencies, or other agencies?

11. What lessons or best practices would you offer to other communities that are considering the deployment of a similar SUM service?

12. Did you use a different business model for your SUM practice in the current rural community operation when compared to your regular operations in big cities?

13. If the answer is 'No' to the above question, do you think a different business model for your SUM practice would be more suitable to rural communities when compared to the business model you use in big cities? Please provide input about how the business model was or could be modified for rural communities?

Questions specifically for SUM agencies that are not yet operational in rural areas

1. What opportunities do you see for SUM services in rural communities?

2. What barriers to SUM services do you anticipate in rural communities?

3. What challenges do you identify for SUM practice in rural communities? Please mention all of them.

4. What strengths do you identify for you SUM practice in rural communities? Please mention all of them.

5. What weakness do you identify for you SUM practice in rural communities? Please mention all of them.

6. Do you think your current business model would be suitable for conducting operations in rural communities?

7. Do you think of a different business model for your SUM practice could be better applicable to rural communities? If so, please provide input about the how the business model could be modified or changed for rural communities?

8. What kind of leadership from federal programs, State DOTs, local government, local agencies, or other agencies would make your SUM practice feasible to implement in rural communities?

9. What incentives or programs would promote your SUM practice in rural communities?

10. What kind of public or private partnerships would encourage to have your SUM service operational in rural communities?

11. What community characteristics would make your SUM service more favorable to deploy in rural areas?

Appendix B: FTA's SUM Frequently Asked Questions and Responses – Eligibility Under FTA Grant Programs

This section provides FTA's responses to frequently asked questions from the transit industry regarding eligibility of SUM services under FTA grant programs. The following content is available on FTA's website as of this writing (FTA, 2017). The information is provided here as it would be relevant to the research topic, and would complement the rural SUM toolkit. While referring this appendix, please also check FTA website for any additions/updates to this SUM frequently asked questions.

Can FTA's programs provide funding for emerging shared mobility services?

It depends. FTA grant recipients are responsible for ensuring FTA funds are used for eligible expenses. The eligibility of shared mobility services will depend largely on the specific contracts entered into between FTA recipients and third parties, such as shared mobility operators. When structuring such contracts, grantees should consider whether the terms of service will meet the legal definition of public transportation, for example, or whether such service may be permitted as an alternative to public transportation within several of FTA's grant programs.

FTA funds may be used to reimburse recipients for expenses associated with public transportation capital projects, and in some cases, for the costs of operating transit service. The statutory definition (49 U.S.C. § 5302) of public transportation is "regular, continuing shared-ride surface transportation services that are open to the general public or a segment of the general public defined by age, disability or low-income."

Examples of eligible public transportation capital projects include constructing waiting or pick-up/drop off areas at a transit facility, or providing information technology (IT) systems that support the use of shared mobility services.

When federal public transportation law allows funding for transit operating expenses, such as in small urban and rural areas, or for job access and reverse commute activities and ADA paratransit services, FTA may reimburse a transit agency for the costs of contracting with a shared mobility operator to provide shared ride service to the general public. This may be an option for off-peak services or first-mile/last-mile transportation. Where contract services are used, the transit agency must ensure that civil rights obligations continue to be met, as noted in the Americans with Disabilities Act FAQs (Appendix C).

In addition, FTA funds may also be used to support operating or capital costs for alternatives to public transportation, particularly under the Enhanced Mobility of Seniors and Individuals with Disabilities (Section 5310) program or as a job access and reverse commute project under FTA's rural and urban formula programs. Such costs may include the costs of contracting with a taxi company or shared mobility operator to provide exclusive ride service or for voucher programs.

What is the difference between "shared-ride" and "exclusive-ride" services?

Local (municipal/state) statutes or regulations, or company policy, will generally determine whether a taxi company or shared mobility operator provides shared-ride or exclusive-ride service. Not all shared mobility services are shared-ride services. For example, if the local regulation or company policy permits the driver to determine whether or not a trip may be shared (for example by declining to accept an additional passenger where there is capacity) the service is not shared-ride. Similarly, if the regulation or policy requires the consent of the first passenger to hire a taxi or shared mobility operator to be obtained before the taxi or shared mobility operator may take on additional riders, the service is not shared-ride.

In essence, services which can be reserved for the exclusive use of individuals or private groups, either by the operator or the first passenger's refusal to permit additional passengers, is exclusive-ride service, and is not shared ride. Not every trip needs to be shared-ride in order for a provider to be considered a shared-ride operator, but the general nature of the service must include shared rides. A recipient passing funds through to a taxi company or shared mobility operator should request documentation from the company to assure the company is providing shared-ride service.

Who may be a recipient, subrecipient or contractor?

In general, the law permits that only states and local or regional public agencies may be recipients or subrecipients of FTA program funds. However, in the grant program for seniors and persons with disabilities (Section 5310), non-profit organizations and private providers of public transportation are eligible subrecipients. Any type of entity may provide service through a contract with an eligible recipient or subrecipient.

Is bike sharing an eligible expense?

It depends on the source and use of funding. Federal public transportation law does not define bike sharing as a form of public transportation; however, the cost of installing bike sharing stations and infrastructure are eligible expenses when functionally related to public transportation. The FTA considers bicycle facilities and improvements to be functionally related to transit when they are located within a three-mile radius of a transit station or bus stop. However, the purchase of bikes for a bike sharing network is not an eligible expense. See FTA's bicycles and transit webpage for information on how bicycles and transit are a win-win proposition.

Is car sharing an eligible expense?

It depends on the source and use of funding. Federal public transportation law does not define car sharing as a form of public transportation and funds cannot be used to operate those services. However, facilities functionally related to transit may be eligible. For example, parking spaces dedicated for the use of car-sharing at local transit stops.

Are micro-transit services eligible?

Yes. If these services offer shared rides and are open to the general public, these services would be considered public transportation and generally would be eligible. Services that do not meet

the definition of public transportation may be eligible as ADA paratransit, as a job access and reverse commute project, or as an alternative to public transportation. A transit agency may contract for eligible micro-transit services; however, the law generally does not permit private firms to be eligible to receive FTA funds as a direct recipient or subrecipient.

As with car sharing, a recipient may provide for the integration of transit services with micro-transit through the design and construction of an eligible capital project. For example, information about these services can be integrated into electronic signage that stream data to applications as part of an infrastructure project in order to provide the consumer with more transportation options.

Are private shuttle services eligible?

No. Private shuttle services, which include corporate, regional and local shuttles that make limited stops to pick up specified riders, are not considered public transportation and are not eligible for FTA funding.

Is ridesharing, such as vanpools and carpools eligible?

It depends on the source and use of funding. Vanpools are a form of public transportation, and may receive capital or operating funds under FTA's grant programs through an eligible recipient or subrecipient.

Are ride-sourcing services eligible?

It depends on the source and use of funding. Ride-sourcing services that provide exclusive-ride service for a single passenger or group are not considered public transportation and are not eligible as a public transportation expense. However, exclusive-ride services may be eligible as an alternative to public transportation in the 5310 program or as a job access and reverse commute project. For example, a transit agency may use FTA funds to provide vouchers for individuals to use an exclusive-ride service.

Is ride-splitting or dynamic carpooling eligible?

It depends on the source and use of funding. In general, ride-splitting, which allows customers requesting a ride to be paired with others traveling along a similar route, is eligible as public transportation if it meets the definition of shared-ride services. The FTA may reimburse a transit agency for the costs of contracting with a ride-splitting company that provides shared ride service to the general public; however, the law generally does not permit private firms to be eligible to receive FTA funds as a direct recipient or subrecipient. For example, a transit agency could contract with a shared mobility operator to provide a shared-ride service as a first/last mile solution as long as that contract requires both the drivers and passengers to accept any additional riders identified along the trip.

What are other potential eligible ways a transit agency may support the use of shared mobility services?

Transit agencies can undertake a number of partnerships or contractual relationships with other mobility providers to provide additional mobility options to the public. Examples include mobility management; joint marketing; advertising; integration of schedules or travel information systems; linking to services from Internet sites; and integrated payment systems, etc.

Additionally, the FTA encourages non-transit uses of transit agency property that can raise additional revenues or, at a reasonable cost, enhance ridership. Incidental uses may include permission for other transportation providers to use transit facilities or parking spaces, as long as such use does not conflict with the intended transit uses of the project property. The recipient must fully recapture all costs related to incidental use from the non-transit entity and any revenues received from incidental use must be used for public transportation purposes.

How can mobility management assist with coordination?

Mobility management is eligible as a capital expense and can be used to coordinate new mobility services with traditional public transportation and other alternative services. The purpose of mobility management is to improve coordination among existing public transportation providers and other transportation service providers in order to expand the availability of transportation options. The FTA supports the National Center for Mobility Management, which provides technical assistance.

Appendix C: FTA's SUM Frequently Asked Questions and Responses – SUM Services and ADA Requirements

This section provides FTA's responses to frequently asked questions from the transit industry regarding ADA requirements while providing SUM services. The following content is available on FTA's website as of this writing (FTA, 2017). The information is provided here as it would be relevant to the research topic, and would complement the rural SUM toolkit. While referring this appendix, please also check FTA website for any additions/updates to this SUM frequently asked questions.

If a shared mobility project doesn't use federal funding, does it still have to comply with Americans with Disabilities Act (ADA) requirements?

Yes. The ADA applies regardless of whether there is federal funding involved. The applicable requirements may depend upon the nature of the project and the service that will result, such as fixed route, general public demand responsive, or ADA paratransit. A transit operator entering an arrangement with a ridesourcing entity to provide fixed-route service using only local funds would be required to ensure that any vehicle used on the system is accessible to and usable by persons with disabilities, including wheelchair users, and ensure that paratransit is provided as a complement to such routes.

Aren't private companies like ride-sourcing entities exempt from U.S. Department of Transportation (DOT) ADA requirements?

No. The DOT ADA regulations cover transportation provided by both public and private entities, whether or not they are primarily engaged in the provision of transportation service.

For example, if a hotel wants to provide shuttle service to its guests along a fixed route serving local attractions, because hotels are not primarily engaged in transportation, the vehicles used may not need to be accessible as long as equivalent service is provided for persons with disabilities, including wheelchair users.

If a shared mobility project only involves non-ADA transportation; does it still have to comply with the service criteria?

If the term "non-ADA transportation" is being used to refer to transportation services that are not ADA complementary paratransit, such services would be covered by the requirements for fixed-route or demand-responsive service for the general public, not by the ADA complementary paratransit service criteria.

It should be noted that the term "non-ADA transportation" is a misnomer; all modes of transportation, other than by aircraft, are covered by DOT ADA regulations.

If a transit system partners with a ride-sourcing entity to provide first-mile/last-mile service, what ADA regulations apply?

Such service would most likely be regarded as demand-responsive service to the general public. The service, though not necessarily the ridesourcing vehicles themselves, would have to be

accessible to and usable by persons with disabilities, including those who use wheelchairs. For the service to be considered accessible, some vehicles, whether provided by the ridesourcing entity, the transit agency, or another contractor, must be accessible to passengers who use wheelchairs, such that the service to passengers with disabilities is equivalent to that provided to passengers without disabilities.

A transit system partnering with a ridesourcing entity to provide service to and from a commuter rail station, for example, could dispatch accessible vehicles from its own paratransit fleet via the ridesourcing entity's smartphone app to accommodate wheelchair users.

What are the requirements for demand-responsive service?

The level of service provided to people with disabilities, including those who use wheelchairs, must be equivalent to that provided to people without disabilities. The service characteristics for determining whether the service is equivalent are:

- Response time
- Fares
- Geographic area of service
- Hours and days of service
- Restrictions or priorities based on trip purpose
- Availability of information and reservations capability
- Any constraints on capacity or service availability

A transit system partnering with a ridesourcing entity to provide demand-responsive service to a new service area would have to ensure not only that accessible vehicles were available, but that any person requiring an accessible vehicle would not be charged more than a typical ridesource user for a similar trip and would not have to wait longer for service.

Who would be responsible for providing equivalent service, the transit system or the ridesourcing entity?

In general, the public entity that enters into the partnership with the ridesourcing entity would be responsible for ensuring that equivalent service is provided. In an instance where the fare structure for the provider of accessible vehicles differs from (is greater than) that used by the ridesourcing entity, the transit operator must offset those costs to ensure that they are not borne by the passenger.

If a transit operator contracts out its shared mobility service to a ride-sourcing entity; would that make it subject to the requirements for public or private transportation?

The requirements for public entities would apply.

The public entity remains responsible for ensuring that the service provided is in compliance with DOT ADA regulations. This can be accomplished by ensuring that the private entity has sufficient accessible vehicles in its own fleet to provide equivalent service; by contracting with a

separate entity to provide equivalent service, or by employing accessible vehicles from its own fleet.

If a transit system offers real-time service to its paratransit passengers using ride-sourcing, can it provide real-time service to eligible passengers? Wheelchair users would still have access to next-day paratransit service.

If real-time service is provided to eligible ADA paratransit passengers, it must be provided to ***all*** eligible ADA paratransit riders, including wheelchair users. This can be accomplished by ensuring that the ridesourcing entity has sufficient accessible vehicles available to provide equivalent service; by contracting with a separate entity to provide accessible vehicles; or most easily by simply incorporating your own accessible paratransit vehicles into the service to be provided by the ridesourcing entity.

Can a transit system use ride-sourcing to provide a portion of its ADA paratransit service?

Yes. It's important to remember, though, that all ADA paratransit service criteria apply:

- Origin-to-destination service
- Service area (at least ¾-mile on either side of a fixed route)
- Response time (next-day, with advance reservation and real-time scheduling permitted)
- Fares (not more than twice the regular fixed-route fare for a comparable trip)
- No restrictions on trip purpose
- Hours and days of service (at least the same as fixed route)
- No capacity constraints

If a ride-sourcing entity plans to acquire a fleet of vans to provide fixed-route service under contract to a local transit system, do those vehicles have to be accessible?

For fixed route service, vehicles must be accessible.

A private entity that purchases or leases new, used, or remanufactured vehicles for use, or in contemplation of use, in fixed route or demand responsive service under contract or other arrangement or relationship with a public entity must acquire accessible vehicles in all situations in which the public entity itself would be required to do so (49 CFR 37.23(b)).

If a transit agency contracts with a ridesourcing entity to provide demand-responsive service, and the ridesourcing entity acquires a fleet of vans to provide that service, the vans must be accessible to wheelchair users unless the system, when viewed in its entirety, meets the standard for equivalent service

A major automaker wants to implement a small fixed-route transportation system in a local community using vans it provides for this purpose. The vehicles will have no established stops, but will be "hailed" by riders through a smartphone app; do any of these vans have to be accessible?

It depends upon the size of the vans.

For vehicles with a capacity of more than 16, including the driver, the vehicles must be accessible to and usable by individuals with disabilities, including wheelchair users (49 CFR 37.101(b))

For vehicles with a capacity of 16 or fewer, including the driver, the vehicles must be accessible unless the fixed route system, when viewed in its entirety, provides equivalent service to persons with disabilities, including wheelchair users (49 CFR 37.101(c))

The interaction between the passenger and the service via the app does not make an otherwise fixed route service demand responsive.

A county wants to use ride-sourcing as part of its Guaranteed Ride Home program, but none of the ride-sourcing entities have accessible vehicles available. The county wants to contract with a taxi company that has accessible vans in order to meet the equivalent service requirement; however, the taxi company wants to charge riders using their vans twice as much as the ride-sourcing entity charges. Can the county pass this difference along to those passengers?

No. Riders requiring accessible vehicles cannot be charged a higher fare. The cost of providing accessible vehicles must be borne by the county's guaranteed ride home program.

Appendix D: FTA's SUM Frequently Asked Questions and Responses – SUM Services and Controlled Substance and Alcohol Testing Requirements

This section provides FTA's responses to frequently asked questions from the transit industry regarding controlled substance and alcohol testing requirements while providing SUM services. The following content is available on FTA's website which was last updated in 2017 (FTA, 2017). The information is provided here as it is relevant to the research topic, and would complement the rural SUM toolkit. While referring this appendix, please also check FTA website for any additions/updates beyond the information that is provided below.

When do the drug and alcohol rules apply?

The U.S. Department of Transportation (DOT) drug and alcohol regulation (49 CFR part 655) provides that the rule applies to recipients and subrecipients of Urbanized Area (§ 5307), Capital Investment Grant (§ 5309) and Rural Area (§ 5311) funds, as well as their contractors and subcontractors. Generally, a ridesourcing company would be a contractor. Under the rule, a contractor is any entity providing a safety-sensitive function for a recipient or subrecipient. The contract may be a written contract or an informal arrangement "that reflects an ongoing relationship between the parties."

Does the testing requirement apply to employees and independent drivers of contractors not otherwise providing public transportation?

Yes. The drug and alcohol regulation (49 CFR part 655) extends the controlled substance and alcohol testing requirement to employees of contractors performing a safety sensitive function. This includes the independent drivers of a ridesourcing company contracting with a public transportation agency. FTA has consistently interpreted the regulation (49 CFR part 655) to include contractors who do not directly engage in public transportation operations, including taxicab operators, if the taxicab exception does not apply. The exception states: In accordance with the current rule (49 CFR Part 655), "the drug and alcohol testing rules apply when the transit provider enters into a contract with one or more entities to provide taxi service. The rules do not apply when then patron (using subsidized vouchers) selects the taxi company that provides the transit service…. [This policy] recognizes the practical difficulty of administering a drug and alcohol testing program to entities that only incidentally provide taxi service on behalf of a transportation service. 66 FR 41996, August 9, 2001."

Are private companies like ridesourcing companies exempt from DOT drug and alcohol testing requirements?

No. There is no categorical exemption of private companies from the controlled substance and alcohol testing requirement. Recipients of Urbanized Area (§ 5307), Capital Investment Grant (§ 5309) and Rural Area (§ 5311) funds must conduct drug and alcohol testing of all employees or contractors performing safety sensitive functions. Ridesourcing companies are subject to the testing requirement to the extent they are a contractor of a recipient and perform a safety sensitive function. However, ridesourcing companies may qualify for the taxicab exception.

What is the taxicab exception and when does it apply?

In general, when a public transit passenger randomly chooses from among a number of taxicab companies providing service, the testing regulations do not apply. The rationale for this is the practical difficulty of trying to administer a drug and alcohol testing program in connection with multiple companies. An example of this scenario is a guaranteed ride home program, in which the transit agency contracts with multiple (two or more) taxicab companies in the area and a passenger may choose which taxicab company to contact to get a ride home.

When does the taxicab exception not apply?

The taxicab exception does not apply when a passenger does not choose the taxicab company providing the service. For example, many ADA paratransit agencies contract with taxicab companies and other entities to provide ADA paratransit service to ambulatory passengers. In those situations, when the ADA paratransit provider (not the passenger) contacts the taxicab company to schedule the ride, the drug and alcohol rules apply to the taxicab company providing the service. Similarly, if a public transit agency provides vouchers to passengers to use for one taxicab company, the passenger does not have a choice of which company to contact, so the drug and alcohol rules apply.

Does the taxicab exception apply to ridesourcing companies?

It depends. The rationale for the taxicab exception is the same for ridesourcing companies when a public transit agency has a contractual or other arrangement with two or more ridesourcing companies or taxicab companies to provide a specific service or type of service, and the public transit passenger chooses among the providers. In this case, the public transit agency would have to contract with at least two ridesourcing companies and/or taxicab companies to ensure the passenger has a choice of which provider to contact for a ride.

There may be some situations in which a public transit agency contracts with two or more ridesourcing companies as well as one or more taxicab companies in order to ensure the service is available for all passengers. For example, the taxicab company may be the only contractor with accessible vehicles, or may be the only contractor able to schedule trips over the phone or accept cash payment from passengers. While some passengers may have only one choice, this does not change the fact that many passengers will have more than one choice, and so the taxicab exception will apply to all of the providers.

If my project is funded with Public Transportation Innovation (§ 5312) research funds, does the drug and alcohol testing requirement apply?

No. If the project is funded with research dollars, the law permits the Secretary to prescribe terms and conditions for the grant award. FTA has determined the drug and alcohol rules do not apply to these funds, even if the recipient of Public Transportation Innovation (§ 5312) research funds is also a recipient of Urbanized Area (§ 5307), Capital Investment Grant (§ 5309) or Rural Area (§ 5311) funds.

Do the drug and alcohol rules apply to pilot programs that do not use any FTA funds?

Yes. Previously, FTA under certain circumstances permitted an exemption from FTA's drug and alcohol rules for up to one year for pilot programs run by public transit agencies. FTA has discontinued that exemption, with the exception of allowing already-existing pilot programs that were making use of the exemption to complete their one-year exemption period. Apart from that exception, if a transit agency subsidizes ridesourcing services, the transit agency must either design the service such that the taxicab exception applies, or incorporate the ridesourcing company drivers into the drug and alcohol program.