FTA
FEDERAL TRANSIT ADMINISTRATION

FACT SHEET

U.S. Department of Transportation
Federal Transit Administration

Integrated Mobility Innovation (IMI) Demonstration Project

Centralized Mobility Management Software
Matanuska-Susitna Borough, AK

Team and Budget

Key Partners: Matanuska-Susitna ("Mat-Su") Borough, Mat-Su Health Foundations, Valley Transit, Sunshine Transit, Chickaloon Area Transit, Mat-Su Senior Services

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$231,191	$100,000	$331,191

Innovation: Project Approach

This project will purchase a commercial "software as a service" centralized mobility management system to centralize dispatch, fleet management, call-taking, and mobility payment integration functions for multiple transportation provider types using a single, online platform. The system will demonstrate the effectiveness of multiple transit and human services transportation providers in a rural area, where traditional transit service is largely cost-prohibitive. This one call/one click system may assign trips to the lowest-cost eligible provider and allow riders flexible request and payment options to improve the rider's Complete Trip experience. With all major providers using the same software, data collection is streamlined and leads to consistent reporting formats, encouraging collaboration among providers and creating transparency to existing and potential funders, government agencies, and the Mat-Su community.

This project will directly address Mobility on Demand by:

- Solidifying a partnership between key public transit and human services transportation providers to promote a more robust solution that accounts for diverse rider needs.
- Harnessing available software to maximize service efficiency within existing transportation resources without sacrificing quality for riders.
- Greatly improving the rider's Complete Trip experience using the same software to handle trip booking, payment, notifications, special requirements, etc., while providing the option for riders to use the central call center if they are uncomfortable using the available technology.

A delegate module available in several software packages will make it easier for human service organizations to book trips for their clients and handle account balances.

This project addresses the Mobility Payment Integration subcategories of Payment Equity & Human Service Transportation Coordination and Integrated Mobility concepts. The project partners are currently assessing software vendors that allow public transit, human service transportation, volunteer drivers, Non-Emergency Medical Transportation (NEMT) providers, and others to use a central platform for payment and billing—the same platform that coordinates all "provider side" and "rider side" activities.

Many current riders still pay with cash. The online payment system will provide another option; it will not replace the cash option. Prospective software vendors will have the flexibility to incorporate available funding to pay for rides or reimburse for trips. New providers would likely include cab companies, as Transportation Network Companies (TNCs) such as Uber or Lyft are not yet widely used in the Mat-Su Borough due to the region's low population density.

Challenges Project is Designed To Address

For local Mat-Su transportation providers, challenges stem primarily from the high cost of providing rural transit, the lack of consistent local government funding, a cumbersome Medicaid NEMT approval and billing process, and generally inadequate coordination between providers. For riders and organizations that represent them, challenges include high costs, limited service hours, and an outdated Medicaid NEMT system that lacks speed and flexibility as well as insufficient knowledge of the range of available transportation services. The Mat-Su Borough Coordinated Human Services Transportation Plan 2018–2022 lists the following challenges:

- Funding concerns, with mixed funding sources, not enough options to acquire funding, and existing resources in a constant state of becoming depleted.
- Lack of financial support of public transit in Mat-Su Borough and affiliated cities.
- High costs to providers; public transit service providers must raise prices or cut services.
- Size of Mat-Su Borough and distance between people and services.
- Concern for transportation services that can adequately provide for the specialized needs of a given organization's clients.
- Cumbersome Medicaid ride approval and billing process.
- Confusion regarding who to call for transportation and the range of transportation options (applies to both providers and recipients).
- Providers working in "silos"; need for complementary services and coordination.
- Lack of education and marketing to create awareness of services.
- Ambulances overused for non-emergency medical transportation.
- Provider and rider ability/willingness to use new or existing services.

Anticipated Outcomes, Benefits, and Impacts

The primary outcomes of this project will be the creation of system-wide efficiency gains in the major public transit and human service transportation providers in the Mat-Su Borough using the same software for scheduling, dispatch, fleet management, and payment management functions. Future marketing for the new software will provide a single website and phone number for riders throughout the borough, allowing them to schedule a ride with the most cost-effective provider for their needs. The addition of system-wide efficiencies will assist Mat-Su transit providers in building a stronger case for local government funding by showing a higher benefit-cost ratio for future public funds spent on the system. The fleet management component of the software will improve driver accountability and scheduling flexibility when issues arise (e.g., vehicle breakdown, traffic congestion).

This project will improve service quality for riders. Transit users will benefit from a one-call/one-click system that handles all aspects of the trip, removing the challenge of having to learn contact information for multiple providers. Riders, caregivers, delegates, case managers, etc., will benefit from a "one-stop shop" to manage multiple trips, detail special needs the provider must meet (e.g., wheelchair accessible vehicle, door-through-door service), and ensure that client accounts have sufficient funds.

Implementing this project will improve system reliability. Using a web-based system hosted by the vendor will improve network reliability, redundancy, data security and recoverability, and customer support. This transfers the responsibility of data stewardship from the individual providers to an entity with a significantly higher capacity to manage data. Improved reliability will help potential riders see transit in the Mat-Su Borough as a viable mode of transportation to employment or any destination with a constrained time requirement (healthcare appointments, etc.).

BRATS On Demand
Baldwin County, AL

Team and Budget

Key Partners: Baldwin County Commission/Baldwin Regional Area Transit System (BRATS), Via Transportation, Inc.,

Other Partners: Alabama Department of Transportation

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$260,800	$65,200	$326,000

Innovation: Project Approach

The past five years have seen significant gains in the research, innovation, and technology development for Mobility on Demand (MOD) projects and best practices. Service in Baldwin County will take the lessons learned from this work and move it forward by applying MOD to a new, rural setting, demonstrating it at a larger scale and operating multiple MOD services under a simpler and fully integrated platform.

For rural areas, the service will expand standard on-demand offerings and practice by offering a service fully scoped for rural mobility. Many communities around the US have already experienced the benefits of MOD, enabling them to easily plan, book, and pay for trips that meet their schedule through a consumer-facing mobile app. MOD has created better access to opportunity for these riders, enabling them to more easily commute to work or school, run errands, and access healthcare more on their schedule.

Although rural areas do represent an operational challenge for MOD service models, as trips are longer and riders are few and far between, these communities have just as much, if not more, to gain from reliable and affordable access to mobility as do urban areas. BRATS On Demand will be the first MOD deployment in the nation designed specifically for rural mobility and the first to serve all trips for an entire transit network. It will test the feasibility of everything from service design to business models, enabling communities and mobility providers around the country to better understand how they can apply MOD to their own particular needs and challenges.

To date, MOD services have largely operated in a discreet section of a larger transit service area, providing coverage to one or two neighborhoods or connections to transit stations. Through this project, Baldwin County will be the first transit agency in the nation to provide all of its services through MOD, either through pre-scheduling or through an immediate, on-demand ride that will reach passengers in minutes. By eliminating all fixed routes and schedules and converting service entirely to MOD, Baldwin County will demonstrate the impact of a completely rider- and demand-driven transit network, where vehicles come only when they need to, cutting operational costs and increasing service efficiency throughout the county. As the first of its kind, Baldwin County will work closely with Via to ensure a fully-flexible service that improves over time in response to demand.

Challenges Project is Designed To Address

Rural communities have largely been left out of the MOD conversation due to longer average trips, a perception that rural populations strongly favor personal vehicles, and business models that often rely on higher population density to operate successfully. BRATS On Demand will address these challenges by deploying a MOD model that accommodates long distance (interzone) trips through a pre-book option within the same mobile application, making public transit a convenient and efficient alternative to personal vehicles.

Anticipated Outcomes, Benefits, and Impacts

Through the BRATS On Demand project, Baldwin County and Via will validate the feasibility of rural MOD business models and document best practices emerging from the demonstration. The project will measure the impact of MOD on rural communities to demonstrate the improved convenience and efficiency to passengers along with a reduction of agency operational costs. The improved service will increase access for older adults and individuals with limited personal mobility, allowing them to live longer, healthier, and happier lives in Baldwin County.

Most importantly, BRATS On Demand will demonstrate that rural public transportation can be responsive to modern trends for on-demand services, proving that public transit will continue to be both a relevant and prevalent aspect for mobility in rural communities.

Developing Standardized Payment Integration and Institutional Capacity for Rural Mobility-as-a-Service

San Joaquin and Stanislaus Counties, CA

Team and Budget

Key Partners: San Joaquin Regional Transit District (RTD), University of California-Davis, Trillium, Kyyti, Interline

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$306,000	$144,000	$450,000

Innovation: Project Approach

The San Joaquin Regional Transit District (RTD) operates a variety of traditional and innovative transportation services within San Joaquin County, an expansive service area covering 1,426 square miles and home to more than 700,000 residents. RTD provides fixed-route and non-traditional services throughout the city of Stockton and surrounding areas within San Joaquin County as well as commuter services to the Sacramento and San Francisco Bay areas.

This project will enhance the regionwide (San Joaquin and Stanislaus counties) multimodal trip planning tool, Vamos, making it the mobility-as-a-service (MaaS) public transit platform for the region. All transit services will be discoverable, and tickets will be purchasable in one app throughout the entire service area. Integrations will be made through standards-based data transactions that develop a model to be used in other localities and projects. After launch of the technologies early in the project, the focus of the demonstration will be on marketing, communication, and user engagement and tracking those activities. The project will develop the best strategies and tactics to support MaaS in smaller urban and rural areas.

The project is a collaboration among regional and local transit providers, university researchers, proprietary software-as-a-service vendors, open-source software developers, and data standards consultants. By sharing infrastructure across agencies, agreeing on shared platforms and priorities, and focusing on building a lean, standards-based system with low maintenance costs, San Joaquin and Stanislaus counties are developing a sustainable MaaS approach for other regions that face similar challenges. The practices and resources developed for this project, as well as a toolbox of marketing approaches, will be shared widely to support other regional efforts.

Challenges Project is Designed To Address

Mobile applications that support a MaaS model will provide a seamless user experience of picking up a mobile device, entering a destination, and seeing a clear and easy way to get travelers to their destination(s). Most MaaS business models are designed and developed by well-resourced agencies or corporations to provide this experience to an urban traveler with ample financial resources and no mobility restrictions. Unfortunately, the reality for clusters of smaller agencies with fewer resources is that available MaaS solutions are often disjointed, piecemeal, and frustrating to use. An equitable MaaS solution will serve those living outside of larger urban areas who have low incomes, and/or disabilities.

The long-term viability of mobile application supported MaaS is critically-dependent on adoption. The mobile application needs to be convenient and effectively marketed to public transit passengers. The proposed project will develop an equitable MaaS platform for San Joaquin and Stanislaus counties by augmenting a recently-launched app in two ways: (1) by integrating payment for fixed-route tickets with the current trip planner app and (2) by testing a series of marketing tactics to support adoption and rider-understanding. Both will be replicable by mobile application developers and public transit providers. Marketing tactics will be evaluated and documented to allow more effective use of scarce marketing funds for public transportation agencies in the future.

Anticipated Outcomes, Benefits, and Impacts

The goal of the project is to provide a better understanding of the most effective strategies and tactics to increase the adoption and use of MaaS in smaller urban and rural areas. The project will produce a report that will serve as a practical guide for agencies, regions, and businesses promoting multimodal trip planning and integrated payment applications and services. These practices will include online, mobile, and social media advertising, community outreach, and physical advertising and will be framed for use by public transit agencies that may not have access to large marketing budgets. The project will also provide open data and open source specifications and documentation on how to integrate payment within an online or mobile trip planning interface so transit agencies can deploy a cost-effective solution. An effective MaaS platform will ultimately improve mobility for passengers who rely on public transit to travel within or between various modes of transit and/or jurisdictional boundaries, with a convenient all-in-one tool.

On-Demand Human Services Transportation for Older Adults, People with Disabilities, and Low-Income Individuals in Boulder ("Via On-Demand")

Boulder, CO

Team and Budget

Key Partners: City of Boulder, Via Mobility Services, University of Colorado Boulder

Other Partners: National Renewable Energy Laboratory (NREL)

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$224,000	$56,000	$280,000

Innovation: Project Approach

In the US, the average cost for providing a one-way paratransit trip is about $47. Meanwhile, America's population is aging, creating an increasing demand for human services transportation. If transit providers and local governments attempt to meet the rising demand, $47 for a paratransit trip is not sustainable. To address this conundrum, the City of Boulder, Via Mobility Services, and the University of Colorado Boulder will undertake a Mobility on Demand (MOD) pilot project, Via On-Demand, that will use autonomous, route optimization software to provide on-demand, wheelchair-accessible transportation to older adults, people with disabilities, and individuals with lower incomes who live in Boulder. By using optimization software, the project team will test the extent to which increasing the number of shared trips and the average number of trips per hour can lower the average cost of a paratransit trip.

Currently, there are several software development companies that have produced on-demand platforms for human transportation services that include innovations such as cloud-based advanced computing coupled with optimization algorithms to continuously reorganize routes in real time, incorporating both scheduled trips, trip changes, and on-demand trip requests. The project team will invite proposals from developers and choose the platform that offers a high level of optimization, quality performance, affordable license fees, and meets other requirements.

Challenges Project Is Designed To Address

The project will focus on providing transportation that enhances the quality of life and functional capacity of persons with mobility limitations, including older adults, individuals with disabilities, and people with lower incomes. Specifically, the project will be designed to support healthy aging and social integration as well as independence and access to employment and training opportunities. The project will also provide human services transportation providers with performance-based metrics for implementing and evaluating on-demand services such as energy efficiency, affordability, more productive use of assets, new revenues, higher customer satisfaction, lower wait times, and lower greenhouse gas emissions/environmental impacts.

Anticipated Outcomes, Benefits, and Impacts

The project team anticipates that using on-demand, optimization routing software for human services transportation will result in efficiencies that reduce the average cost per trip while increasing mobility options and convenience for people with mobility limitations. With an aging population, it becomes increasingly important for communities to support healthy aging, including addressing the problems of access to health care and the isolation experienced by older adults and people with disabilities. For persons with lower incomes, affordable and convenient mobility options are a means of increasing social equity in a transit system. All three project target populations will benefit from the independence and easy access to employment and training opportunities that MOD services provide.

The project team and other human services transportation providers will benefit from the development of performance-based metrics for implementing on-demand software platforms and services. The metrics will also be applicable to on-demand public transit options developed to address first/last mile needs of the public, especially commuters. For these reasons, the results of the project will be published and data will be made available to the public.

GHPIM Mobility Platform
Greater Hartford Transit District, CT

Team and Budget

Key Partners: Greater Hartford Transit District, M7

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$630,000	$316,665	$946,665

Innovation: Project Approach

The Greater Hartford Transit District intends to provide a new expansive, demand-responsive, 24/7 transportation option to older adults and persons with disabilities that will fill many of the service gaps in the Greater Hartford Metropolitan Area and surrounding remote rural areas, while providing a Complete Trip experience for all passengers. The service will be called the Greater Hartford Program for Innovative Mobility (GHPIM).

To accomplish this, the District is partnering with Connecticut's largest private transportation provider, M7, which has the smart technology to assist in providing a Complete Trip experience to riders and those not eligible for Americans with Disabilities (ADA) service. Eliminating the advance trip notification requirement and travel boundaries are two key elements that will greatly improve the quality of life for qualified passengers within the District. This project will provide riders with the ease of booking a reservation and arranging payment through flexible technology options from the low-tech to the high-tech user. Riders will be able to schedule trips through a customer service toll-free number, web portal, and mobile app. It will address the provision of the Complete Trip experience for older adults and persons with disabilities and will measure impacts on the local community, providing broad access to mobility options for all travelers any time of day throughout the year and to any destination in the specific project area.

Challenges Project is Designed To Address

Statewide challenges reported in the Connecticut Locally Coordinated Human Services Transportation Plan include the following:

- Service to/from smaller towns – fixed-route bus operators provide the most extensive service in areas where population densities support regularly-scheduled service.
- Inter/intra-regional transportation – the transportation services offered by smaller towns are focused on the movement of citizens within the municipalities in which they reside.
- Weekday off-peak timeframes – Throughout the state, demand for both fixed-route and specialized transportation service target groups is strongest during rush hour and midday.
- Weekends – Although all fixed-route bus providers operate service on one or both weekend days (except for Meriden), the level of service provided varies greatly by route.

Hartford Urbanized Area challenges for target populations include the following:

- Older adults noted the importance of available transportation as part of a continuum of care that enables them to stay in their homes.
- Dial-a-ride users noted the inconvenience of needing to schedule ahead and of circuitous routing.
- The disabled community identified the need for inclusive public transportation that enables independence.
- More evening and weekend service on public transportation is needed.

Anticipated Outcomes, Benefits, and Impacts

With the new GHPIM program:

- Riders will be able to access information about the project faster.
- Links will be created between the District and its key partner, M7, through smart technology.
- Riders will experience a Complete Trip by being able to book and pay for a trip through their chosen device, whether low-tech (telephone) or high-tech (mobile app).
- Gaps in service will be filled by M7's ability to provide service 24 hours per day, 7 days per week, 365 days per year.
- Riders will experience cost-effective and efficient mobility, improving their personal lives and providing a positive impact on the community.
- Publicizing the service will result in human service agencies referring customers, and unmet needs will be met.

A goal of the GHPIM project is to use paratransit resources in ways that serve more riders in a more efficient way while making the trip experience easy and convenient for customers.

Automated Buses on CTfastrak
Central CT

Team and Budget

Key Partners: Center for Transportation and the Environment (CTE), New Flyer, Robotics Research, University of Connecticut (UCONN), Capital Region Council of Governments (CRCOG)

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$2,000,000	$7,535,691	$9,535,691

Innovation: Project Approach

The Connecticut Department of Transportation (CTDOT) and its assembled team will test automated buses capable of up to Level 4 automation on a dedicated right-of-way in Central Connecticut. The demonstration will deploy three 40-ft New Flyer Excelsior Charge battery electric buses equipped with automated driving systems (ADS) on the CTfastrak bus rapid transit (BRT) corridor, a dedicated nine-mile-long facility for exclusive use by CTtransit buses. Although the project will demonstrate technology capable of up to Level 4 automation, the team will address IMI program objectives, namely Demonstration #1 in FTA's Strategic Transit Automation Research (STAR) Plan, by focusing on precision docking and bus platooning Level 2 automation.

CTDOT is pursuing the integration of ADS on its CTfastrak buses as a unique innovation to 1) improve Americans with Disabilities Act (ADA) accessibility at platforms through precision docking to eliminate driver error that results in unsafe situations for passengers, 2) increase vehicle efficiency and capacity on the guideway through bus platooning, and 3) reduce the number of accidents resulting in injury or vehicle damage at two intersections along CTfastrak due to cross traffic not stopping at red lights. The project team will place radar units in each direction at both crossings that will relay oncoming vehicle trajectories and speed via Dedicated Short Range Communications (DSRC).

This project will allow CTDOT to test increasing levels of automation while in revenue service. The dedicated guideway provides a controlled environment in which greater levels of automation can be tested at relatively high speeds. The CTfastrak guideway is a controlled environment, as both pedestrians and non-CTDOT vehicles are prohibited.

Challenges Project is Designed To Address

Although many cities have deployed low-speed automated vehicles (LSAV), no municipal or state agency has invested in automating high-capacity bus transit. Few transit bus services in the US operate on entirely separated guideways and can readily benefit from the degree of automation targeted in this CTfastrak demonstration, and these advanced driver assistance systems (ADAS) are far closer to market-ready in accordance with program requirements. When combined with a demonstration of vehicle-to-infrastructure (V2I) capabilities, this research can help accelerate the commercialization of these capabilities within the next several years. CTDOT and its project partners are committed to putting the country's first 40-ft automated buses into service at speeds up to 40 miles per hour and will do so in a compelling environment with high transferability potential to other public transit agencies.

The project team believes that pursuing a Level 4 ADS automation suite of capabilities offers transit agencies a better return on investment than the pursuit of individual, compartmentalized features. This project will allow CTDOT to test increasing levels of automation while in revenue service. The dedicated guideway provides a controlled environment that prohibits cars and pedestrians such that greater levels of autonomy can be tested at high speed. Other demonstrations of autonomous shuttles have shown some success in mixed traffic environments, although they have been limited by drivers frequently taking over control of the buses when they do not fully trust the technology to respond appropriately in given situations. As drivers develop greater comfort with the technology, they learn how it works and adapt.

Unlike other closed testing grounds, the CTfastrak guideway transitions to a mixed traffic environment. Although the proposed project scope does not anticipate testing full autonomy in the mixed traffic environment, driver assistance features will remain active to improve vehicular safety. Currently, one of the most dangerous situations for a bus is when a pedestrian approaches it from the left; assistance features can alert the driver to the presence of the pedestrian and help them avoid collisions.

Anticipated Outcomes, Benefits, and Impacts

This project will add value as a demonstration of ADS technology in New England, which experiences all four seasons. The CTfastrak guideway is maintained as a highway and remains in service even when other transit services are shut down due to inclement weather. To date, all public sector automated vehicle pilots involving low-speed shuttles have shut down during snow events; the ADS technology demonstrated in this project will have a greater tolerance for unfavorable conditions. ADS will be engaged in light rain or snow, although accumulation of snow on sensors or heavier precipitation that greatly limits visibility will require drivers to disengage the system and operate the buses manually.

Whereas relatively few transit agencies operate BRT service in partially or completely dedicated rights-of-way, these environments represent the most straightforward replicability for the capabilities demonstrated in this project. As the technology matures, agencies can introduce it into increasingly complicated operating environments, progressing finally to all routes with mixed traffic. The lane-keeping, automated braking and acceleration, and precision docking features all offer value to transit operations today, even if implemented as driver assistance features rather than an intended complete automation.

Successful demonstrations of platooning would change the planning calculus between light rail and BRT. Agencies could provide similar capacity to light rail trains with a strictly 40-ft bus fleet and a single driver rather than running multiple 40-ft buses with multiple drivers or procuring 60-ft articulated buses.

Most automated vehicle deployments to date have generated little performance data for public consumption, as developers have considered those data competitive and highly proprietary. The data collected and reported to FTA during the CTfastrak demonstration will inform future research policymaking. Driver and rider surveys will capture public comfort levels with the technology. Comparing results in the controlled environment of the guideway with results in other less-controlled environments will allow researchers to better understand the factors that influence public perception and comfort.

Atlanta-Region Rider Information and Data Evaluation System (ATL RIDES)

Atlanta, GA

Team and Budget

Key Partners: IBI Group, Inc., Metropolitan Atlanta Rapid Transit Authority (MARTA), Atlanta Regional Commission (ARC), Gwinnet County Transit (GCT), Cobb County Transit (CCT), State Road and Tollway Authority (SRTA) Xpress, Cherokee Area Transit (CATS), Douglas County Transit (Connect Douglas), Georgia Regional Transportation Authority (GRTA)

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$430,400	$307,600	$738,000

Innovation: Project Approach

This project will develop an open source iOS and Android mobile application, the first of its kind for Open Trip Planner (OTP) implementations. The mobile app will include all functionality of the web-based User Interface (UI) with the addition of live tracking, allowing users to opt in to receive service alerts and dynamic rerouting of trips. To incorporate mobile payment, the application will integrate with the Breeze Mobile project currently under development by MARTA, extending the existing regional Breeze fare payment platform to mobile devices. This project will add new functionality to the OTP React UI to support integrated fare payment for planned trips. The intention is to keep fare payment integration vendor-agnostic to ensure replicability.

To leverage app-generated data for system improvement, the project will create a Connected Data Platform (CDP) that manages inputs and outputs to/from OTP. The CDP will build upon two specialized OTP modules, OTP Data Tools and OTP Middleware, which monitor data quality and provide insight on user preferences and behavior. OTP Data Tools stores and analyzes General Transit Feed Specification (GTFS) data, allows users to edit and consolidate GTFS feeds, and deploys feeds to OTP. This project will extend this module by adding the ability to periodically record GTFS-real time (GTFS-RT) feeds (e.g., once hourly) and monitor quality in terms of conformance to GTFS best practices. Summary statistics of the GTFS data and GTFS-RT samples will be stored in the CDP database. OTP Middleware, currently under development for Florida Department of Transportation District 5, records data such as number of users and user inputs including origin-destination pairs, travel preferences, and calculated trip itineraries. This module will be extended to collect data quality scores, missed connections on tracked trips, patterns of stated and revealed user preference related to mode choice, travel time, cost, and transfer behaviors, and user feedback. Some data will be stored only if the user opts in.

An application programming interface (API) will allow authorized agency staff to access data stored in the CDP. Regional transit partners will develop data sharing protocols and construct a shared repository to house, at a minimum, data pulled from the ATL RIDES CDP and selected operational data from regional operators. MARTA, SRTA, and ARC have staff teams focused on transit planning and analytics who can leverage these new data resources. Many of these staff meet regularly in a cross-agency technical group and actively support each other's work. As the ATL RIDES demonstration progresses, valuable analyses can be identified

organically, resourced by agency staff or supplementary consultants, and used to inform planning and operational decisions that improve regional transit service.

The ATL RIDES application shows novel collaboration among public and private sector partners. Partnerships with participating transit agencies and local governments will be key to providing relevant data inputs to the OTP routing engine, and the team will pursue data sharing agreements with shared-use mobility and ride-hailing platforms. The CDP also will support data sharing and improved business intelligence among the regional partners.

Challenges Project is Designed To Address

A primary challenge anticipated as part of the successful implementation of the proposed ATL RIDES project is the current fare system structure within the Atlanta region. Multiple regional studies of transit operations conducted by operators and the ARC have identified the lack of a standard and consistent fare structure across operators and different fare media products across systems as significant barriers to entry and obstacles for public transit customers.

The ATL has executed a task from its General Planning Services contract that will begin to develop recommendations for how the Atlanta region and its operators can better integrate fare structures and create coordinated fare media. The completion of this task will allow the ATL to work collaboratively with regional operators to identify solutions to these fare structure challenges and ultimately improve accessibility to customers while building a more seamless and integrated transit network across operators.

The ATL and regional project team is committed to ensuring that these fare structure challenges are addressed in a timely manner. With the new collaborative regional structure in place, these obstacles will not impact the integrated mobility fare payment aspects of the ATL RIDES project.

Anticipated Outcomes, Benefits, and Impacts

The expected outcomes of the ATL RIDES project are twofold. First, a public-facing journey-planning app will improve the multimodal trip planning experience for individuals and improve the overall visibility of transit options as part of an integrated mobility network. This project will significantly improve the trip planning experience for transit riders in the Atlanta region by providing the first app that fully integrates all regional transit services, ingesting disparate transit feed data and accounting for transfers across providers. The project will also provide the first app that fully integrates options for cross-modal links in a transit-supported trip. This will account for various market preferences, including walk and bike to transit as well as drive-to-transit, which is prevalent in this car-oriented and multi-centric region. Customers will have the ability to compare transit-supported trips, which may include both driving and non-driving links at the first/last mile, with drive-only trips. The ATL RIDES app will account for the full cost of a journey, estimating monetary, temporal, and environmental costs. Individual customers can then make travel choices that most align with their individual values of least-cost, least-time, or most environmentally-conscious. Without accounting for the full travel cost, travelers often overlook the impacts of parking, tolls, and gas on their driving trip, which may make a transit-supported trip more affordable in comparison. Also, for a growing number of journeys, transit may provide time-competitive options due to Atlanta's traffic patterns and new priority facilities such as the Georgia Express Lanes System and developing bus rapid transit (BRT) projects that are currently in the planning stage.

The second outcome of this project depends on learning and action on the part of regional transit operators and planning partners. Through the Connected Data Platform, data generated by the ATL RIDES app and app-users can be paired with other agency-generated data and even purchased datasets. Trip-making behavior and direct user feedback from the app will reveal patterns of customer preferences and values from which transit operators and planning partners can learn. This information can be used to develop improvements to the public transit network that make it more competitive with personal auto use and a more reliable component of the multimodal mobility system. For the public transit agencies and local partners, the application would provide a medium to share data across agencies and other transportation private partners, providing a resource to guide decisions on planning and operations. The intended benefits reach far beyond just providing

a trip planning tool for individual customers. With a connected data environment across regional transit agencies and other transportation providers, it is expected that transit agencies can better plan their services, and, consequently, improve the transit experience for a growing community of current and future riders.

Kootenai Regional Mobility Platform
Coeur d'Alene, ID

Team and Budget

Key Partners: Passio Technologies, Kootenai County

Other Partners: Whitetail Transportation, Kootenai Health, Coeur d'Alene Tribe, Cities of Coeur d'Alene, Post Falls, and Hayden

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$150,000	$37,500	$187,500

Innovation: Project Approach

Kootenai County, located in scenic North Idaho, is one of the fastest-growing areas in the US, with a growth rate of 19.1% over the past decade. Proximity to Spokane and an intersection of north-south and east-west interstate highways brings businesses and workers, and the number of older adults relocating there is projected to double over the next 5–7 years. Despite the area's growth, much of the population is financially struggling, with approximately 41% of the community in the Asset Limited, Income Constrained, Employed (ALICE) category of income, and 16% of them within the poverty level. The County encompasses 14 incorporated cities and several rural communities with a total population of 165,697, giving the region a hometown feel while creating transportation challenges for residents and visitors. Public transportation is key to the area's ability to link residents to opportunities for employment, education, healthcare, and recreation.

Riders currently have access to technology specific to public transportation—an app that allows them to see routes, identify stops, and track buses—as well as bus trip planning on both Apple and Google Maps. Citylink North has been successful in implementing partnerships with several community agencies, but a true multi-modal platform that provides access to both public and private transportation options is crucial to meeting the transportation needs of a burgeoning populace.

The proposed Kootenai Regional Mobility Platform will be built using the Passio Intelligent Transportation System, which includes Navigator™ for fixed-route management, ParaPlan™ for demand-response, Connect™ for on-demand, and GO™ for rider-facing apps on major mobile platforms. Using GO, riders will be able to make informed mobility choices using a dynamic trip planner that is optimized based on the rider's preferences and history. Using open data standards, GO will incorporate public and private transportation providers, giving access to mixed modes such as walking and bike-share. Total time and cost of the trip will be visible to the rider and displayed intuitively in the app. This comprehensive trip planner will give the rider a high level of confidence in their transportation decisions, and the Mobility Platform will enable public and private partners to establish service fares and collect payments when a trip is booked or with a clearinghouse. It also will allow pass-through authentication so riders can link existing accounts. Riders will be able to download the app free on iOS and Android devices and can then set up a personal profile for transportation service including accessibility preferences and payment options.

The Mobility Platform will be rolled out in three phases. Phase I will define the data standard that will manage the available transportation options, service times, geographic service area and associated costs. The project

will includes new interfaces for partners and management tools for Kootenai County, and the data will feed the trip planner in GO, providing informed transportation choices. Phase II will extend the data standard, allowing for booking and confirmation of rides in GO, and Phase III will include payments, allowing for a full single app experience of booking, confirming, and paying for a trip, regardless of transportation provider.

Challenges Project is Designed To Address

The current GO app limits a rider to planning a trip on a Citylink North route only. Riders wanting to consider multimodal options or compare costs must access a variety of individual apps, each with its own profile information, payment information, and user interface. The apps are not aware of each other, so multimodal options are not available for recommendations. In a scenario in which a rider is 10 miles from home and the first 8 miles could be accommodated by a fixed route, he/she would have a difficult experience building a multimodal trip using a Transportation Network Company (TNC) such as Uber or Lyft to complete the last two miles. In the end, the rider is more likely to use the TNC, making the trip 10 times more costly than a multimodal trip. The Mobility Platform will have access to information about all available trip options, including information that might be more important to an environmentally-conscious or health-minded rider. GO will display these data intuitively to riders, enabling them to make transportation decisions beyond traditional time and cost metrics. The data will include CO_2 saved by using alternative mobility options vs. a single-occupancy vehicle, calories burned, and steps taken for each travel option.

Anticipated Outcomes, Benefits, and Impacts

The Mobility Platform will allow for fully-educated trip planning across a consolidated selection of public and private transportation providers. Having in-app payment options will provide riders with confidence that they have secured the correct fare media to get to their final destination. The mobile ticketing also will reduce the need for riders to use fareboxes, creating a seamless boarding process.

Additionally, ticket vending machine use will be reduced, saving costs on paper and machine maintenance. Transportation partners on the Mobility Platform will have additional exposure to potential riders and will be able to adjust prices and service types to meet market demand. The Mobility Platform will collect detailed origin, destination, and transportation mode selection for every trip booked in the system, data that can produce valuable ridership reports for Kootenai County and its transportation partners and provide information on ridership trends, coverage gaps, and opportunities for higher levels of service. Kootenai County can track these data to funding sources to accurately predict how additional funds would affect ridership.

Citylink North is excited to take this next step into the future with a Mobility Platform that will benefit communities, local economies, and residents with one interface to enhance and ease navigation as local travelers access employment, education, health care, and recreation in Kootenai County.

Cecil Transit's "Roadway to Recovery: Driving Transformational Change and Removing Barriers for the Recovery Community"

Cecil County, MD

Team and Budget

Key Partners: Routematch, Creative Bus Sales

Other Partners: Cecil County Recovery Houses

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$562,845	$140,745	$703,950

Innovation: Project Approach

Cecil County suffered from a high volume of opioid prescriptions being dispensed in the 1990s and 2000s, bringing the opioid crisis (followed by heroin) to the community early. The high volume of opioid prescriptions coupled with a lack of treatment and mental health providers to meet the needs of the community resulted in high rates of overdose starting as early as 2007. Since that time, Cecil County's overdose rates have often been double the state rates, and Cecil's drug-induced death rate remains second only to Baltimore City as of 2017. Most recently, the number of fatal overdoses in Cecil County has decreased while the number of non-fatal overdoses continues to increase; Cecil County saw an 18% increase in non-fatal overdoses (516 to 592) from 2017 to 2018. Treatment and recovery support services also increased in Cecil County; there are 150 beds in local recovery houses to support those most vulnerable in their substance abuse recovery efforts.

To expand current services in support of unmet transportation needs of persons residing in and around the recovery houses, Cecil Transit will provide on-demand transit service in designated service zones. Integrated with Cecil Transit's family of services, the project will operate Monday through Saturday from 4:00–12:00 AM and will create a Complete Trip service model that provides access to employment, education, shopping, legal proceedings, and other life necessities. Cecil Transit will use five accessible vans, a project coordinator, and six drivers to manage and operate the project while using innovative mobile technology to enable all residents of participating recovery houses to spontaneously schedule trips, monitor vehicle locations, and make electronic fare payments. This transformational project seeks to collaborate with recovery houses in an effort to break down transportation barriers and increase mobility options. It will increase accessibility options for recovery house residents by providing innovative technology to access Cecil Transit's on-demand, curb-to-curb transportation services while maximizing rideshare opportunities and/or connecting participants to fixed-route services when applicable.

Challenges Project Is Designed To Address

Many individuals impacted by the opioid crisis in Cecil County reside in substance abuse recovery houses, and most residents have lost their driving privileges and/or have no access to a working automobile. Due to the lack of reliable, spontaneous transportation options, residents of recovery houses often have a decreased perception of independence. Cecil County has a limited presence of Transportation Network Companies

(TNCs) such as Uber or Lyft, and taxi services can be a costly alternative, with limited availability in early morning or late night. Individuals in recovery often must rely on family members and friends to give them a ride, which presents a challenge, as those in recovery can easily be reintroduced to influences detrimental to their recovery efforts. Although the project cannot eliminate triggers or the possibility of relapse, it can decrease the possibility of individuals having access to locations and individuals that may make recovery difficult. The project will further support recovery by allowing travelers to regularly maintain their appointments and obligations with medical and mental health providers, employers, treatment services, support networks, probation officers, and drug court. In addition, the program will expand options in all of these areas, particularly employment, beyond the limited distance imposed by the current service characteristics. This increase in reliability and reach will enhance the ability for individuals to maintain their fiscal independence.

Anticipated Outcomes, Benefits, and Impacts

The Cecil Transit project strives to replicate the Complete Trip concept that will synthesize all aspects of an individual's trip from the planning phase through arrival at the destination. The concept takes full advantage of technology and other transit system resources to plan a trip that actively uses multiple modes of travel in benefiting each participant's life needs.

Although the benefits of this project are targeted specifically to individuals with substance abuse disorders, the project seeks to address critical mobility needs in Cecil County while continuing to build a healthy, vibrant community. It is anticipated that this Mobility on Demand and Complete Trip model, if successful, can be replicated to address other critical mobility needs in the community as a whole. This model can be used to expand available services in geographically-isolated communities, as a barometer to gauge the need for expansion of fixed-route service to reduce the growing strain of increasing demand non-emergency medical transportation services on the public transportation system, and to support future economic development within the growth corridor. Lessons learned from the project can also be applied to rural communities across the US that continue to combat the effects of the opioid addiction crisis. As this project is scalable, contingent upon available resources, communities could design service zones and operational hours to meet the individual needs of their community.

Impacts will be measured jointly by Cecil Transit and the recovery houses through surveys prior to the start of the program, at project conclusion, and periodically throughout the pilot. Participants using the project's smartphone application will be prompted to complete a survey and receive a link to it. Each participating recovery house will administer hard copies of the surveys to individuals without a smartphone and to non-participating residents. Responses of non-participants will be used to create a control group to measure the success of the program. Surveys will seek to measure participant mobility and life impacts, including reducing missed appointments, accelerating job searches and gainful employment, perceived level of independence, reduced rate of recidivism, and increasing financial independence.

ITNCountry: Transportation for Rural and Small Communities

Portland, ME

Team and Budget

Key Partners: ITNAmerica®, Esri, Salesforce

Other Partners: Maine Department of Transportation

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$1,658,025	$378,595	$2,036,620

Innovation: Project Approach

Independent Transportation Network (ITN®) is a non-profit social enterprise founded in Portland, Maine, in 1995 as a model for community-based, non-profit transportation service designed to meet the mobility needs of older or visually-impaired people. It uses private automobiles and a combination of paid and volunteer drivers to provide door-through-door and arm-through-arm service 24/7 for any purpose. People who use the service become members and open a pre-paid Personal Transportation Account™ that is debited to pay for their rides. Through research funded in part by the Transit IDEA program, ITN developed innovative payment plans that expand the resources available to pay for rides, such as CarTrade™, in which older people trade the cars they no longer drive to pay for their rides, or Transportation Social Security™, in which volunteer drivers earn credits for their own future mobility needs by driving others now. In 2004, ITN created the national organization, ITNAmerica, which provides technical assistance for ITN affiliates across the country. ITNAmerica also supports Rides in Sight™, a searchable on-line database and hotline for all older adults transportation in the US.

ITNCountry: Transportation for Rural and Small Communities is based on the ITN model, using ITNRides™ software rebuilt on Salesforce with funds from the Philanthropic Collaborative for Rural Transportation and donated algorithms from Esri to support a large national system affordable to small and rural communities. Although the software for ITN and ITNCountry are the same, the business model, corporate structure, and availability are different, with ITNCountry offering maximum flexibility and adaptability to each community, yet remaining unified on the same Salesforce platform.

Challenges Project Is Designed To Address

Transportation for rural and small communities is one of the most intractable of all transportation problems. This is because resources tend to diminish as distances and corresponding costs increase, while opportunities to gain efficiency through shared rides decline. Traditional transit solutions can become especially strained in lower-density areas where trips become infrequent and lengthy. Moreover, many rural residents with special needs, such as older adults, those who are visually-impaired, and people without access or ability to operate an automobile, need door-thru-door service and some form of assistance. On the other hand, rural and small communities are frequently rich in social capital, neighborliness, and can-do spirit.

This two-year project will work with rural communities in Maine, Kentucky, and California to test the market-sensitive, consumer-oriented Mobility on Demand ITN model, currently operating successfully in urbanized areas in 12 states in lower-density rural communities. This deployment will expand accessibility to transportation for older adults and other special needs populations, such as people with visual impairment or developmental disabilities, among others, and will address payment equity through use of Personal Transportation Accounts. By quantifying and storing social capital through the use of volunteer driver credits, it will increase the resources available for rural transportation. Finally, by deploying ITNRides software on the Salesforce platform with effective routing and scheduling algorithms from Esri, it will help rural communities increase access to transportation through efficient use of volunteer and community resources. At the same time, using the Salesforce Marketing Cloud, it will position ITNCountry for cost-effective national deployment.

Anticipated Outcomes, Benefits, and Impacts

Implementing ITNCountry in lower-density rural and small communities will offer an affordable, world class technology platform and stable software for volunteer transportation services. ITN's national marketing campaign, supported by a connected technology platform, has the potential to relieve small volunteer-based providers of the necessary outreach burden, much as the Red Cross helps communities run blood donation drives. By implementing the ITNCountry Mobility on Demand market-based model in three states and nine locations, there is an opportunity to gather data in diverse communities. These combined factors—world-class technology, a national marketing campaign, and a geographically-diverse implementation—will provide a rich learning experience and properly position ITNCountry for national deployment. Through ITN's innovative payment plans and ITNCountry's flexible implementation plan, unbanked and lower-income people will have more transportation options, and social capital and volunteer labor available for transportation will increase and be used more efficiently and effectively.

The benefits of these innovations will improve access to healthcare, nutrition, and social interaction (reduced social isolation) for older adults and other special needs populations, improve economic opportunities for low-income people, strengthen community in rural areas, and help older adults remain in their homes.

CHARTS: Comprehensive Healthcare Access with Rural Transit Solutions

Traverse City, MI

Team and Budget

Key Partners: TransLoc On-Demand Software/Ford Mobility, Intelligent Transportation System (ITS) Technology (TBD), Northern Michigan Community Health Innovation Region (NMCHIR), Grand Traverse Region Community Foundation, Disability Network Northern Michigan, Area Agency on Aging Northern Michigan, Michigan Department of Health and Human Services, Groundwork Center for Resilient Communities

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$276,499	$69,125	$345,624

Innovation: Project Approach

Bay Area Transportation Authority (BATA) serves two scenic rural counties in northwest Michigan—Grand Traverse County (population 92,000) and Leelanau County (population 22,000), one of the oldest counties in the US with 38% of residents over age 60. BATA delivers more than 530,000 rides annually with fixed-route and demand-response services. The Bayline route, introduced one year ago, has been a game-changer for BATA and its local community. Supported by local municipal and private business sponsorships, Bayline is a fare-free, high-frequency service running the east/west corridor in Traverse City with "book-end" park-and-ride lots. It provided more than 140,000 rides in its first year, and ridership has grown on connecting routes as a direct result.

BATA will use IMI funding for the acquisition of an ITS technology suite for integration with newly-purchased TransLoc/Ford Mobility On Demand software. It will coordinate the CHARTS Coalition/Comprehensive Healthcare Access with Rural Transit Solutions, a collaborative of human-service agencies, to develop a best-practice non-emergency medical transportation (NEMT) program. CHARTS will work alongside a public-private sector strategy group supporting BATA's community-wide pilot of on-demand micro-transit service. BATA's inclusive process with these stakeholders, coupled with technological advancements, will result in a successful launch of an enhanced mobility ecosystem. This endeavor will have a sustainable impact for BATA's constituency accessing the regional healthcare system and enable efficient and effective public transit options for the overall rural population.

Challenges Project Is Designed To Address

BATA has pushed its current technology envelope as far as it can go, with four departments running on stand-alone software—Dispatch, Assets, Security, and Business Operations—none of which can transfer information to each other. As individualized technology with smartphones and apps become more sophisticated, ridership expectations of convenience and comfort have risen. If BATA is to grow in an effective and efficient manner and meet the needs of its constituency, it must get ahead of the curve and engage with systematic technology solutions.

Transit research shows that moving the needle for increased public transportation ridership is dependent on convenience, frequency, and amenities. On-demand technology and transit is clearly the most direct route to meet that challenge. Based on BATA's review of some critical issues in the healthcare field, it found that the lack of access to care has a primary impact on health and well-being. Medical clinics in the BATA region report an average rate of appointment no-shows at 28%. A regional health care initiative, NMCHIR, has completed more than 20,000 patient screenings in area Medicaid clinics to monitor primary social determinants of health (SDOH). Of those patients who requested referrals, 10% reported that lack of reliable transportation options impacted their ability to access healthcare on a regular basis. BATA is examining how Medicaid clinics can be proactive by using on-demand transit to transport patients in real time as needed.

Anticipated Outcomes, Benefits, and Impacts

With the acquisition of an ITS technology suite of software, BATA will have an integrated platform that allows all departmental systems and data banks to intersect and produce accurate and comprehensive reports and projections. ITS will also open the door to a high level of inter-departmental efficiency and the ability for BATA to undertake in-depth service and operational analyses.

BATA's upcoming on-demand service addresses the unmet need of NEMT transit for a rural demographic. Immediate access to healthcare will reduce incidences of untreated illness, and reliable transportation options are expected to reduce stress and increase health and well-being. Reduced costs for transit, medical clinics, and patients will be realized with reductions in no-show and cancellation incidents. Passengers will have added mobility options for origin to destination travel that offer both reserved and immediate transportation for NEMT appointments. All micro-transit vehicles will have wheelchair accessibility and drivers who are Commercial Driver License certified, background checked, and sensitivity-trained. Passengers may be pre-approved for agency-hosted NEMT without needing funds to pay for their travel, as the fare will be directly billed to the agency.

IMPACT: Mobility Platform and Transportation Integration Gilbert, MN

Team and Budget

Key Partners: Feonix – Mobility Rising, Duluth Transit Authority

Other Partners: St. Louis County Public Health and Human Services, Essential Health Wellness Center

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$952,807	$251,040	$1,203,847

Innovation: Project Approach

Arrowhead Transit is a rural public transportation agency that serves eight counties in northeastern Minnesota—Aitkin, Carlton, Cook, Itasca, Koochiching, Lake, Pine, and St. Louis. It provides coordinated, multimodal transportation options using Dial-A-Ride, Rural Rides, and volunteer driving programs to 600,000 riders annually. With a core mission of developing a Mobility on Demand service coupled with Mobility Payment Integration (MPI), IMPACT will develop and demonstrate a linkage for first/last mile travel options connecting rural populations to multiple public transit systems and create a business model for a non-profit community-based transportation program. IMPACT has partnered with Feonix – Mobility Rising to develop scalable technologies to enhance the rider experience and promote accessibility options. Feonix-Connect will develop a Mobility as a Service (MaaS) passenger app, driver app, and volunteer "scheduled/on demand" app. It also will develop a MaaS dispatcher platform, ride booking platform, and online booking platform to provide fast and reliable transportation.

The envisioned IMPACT platform will provide consumers with a multimodal portal to facilitate trip planning, ride information, pricing, and direct booking options and will serve as an automated platform to connect ride requests with available transportation options. It will provide accessible, affordable transportation options, access to various payment methods, and a community resource guide to assist consumers in reaching a level of self-sufficiency that will allow them to remain productive members of their communities.

The IMAPCT platform will be implemented in two phases. Phase I will assemble a steering committee of Arrowhead Transit staff, differently-abled adults, and representatives of human service organizations that will assist in developing, implementing, and evaluating the project. This phase also will include exploring MaaS software options and developing a process for data collection as part of the IMPACT project. Phase II will expand and build a robust volunteer driving network, develop partnerships with financial institutions to understand options for unbanked on underbanked customers, identify and develop transfer hubs and payment options, and implement transportation service and software and will identify opportunities for businesses to provide combined event and transportation ticket purchasing in a single payment.

Challenges Project Is Designed To Address

As a largely rural community, the Northeast Minnesota Arrowhead Region has limited ability to connect riders to services available in Duluth. Thus, customers experience very large gaps in mobility services in many rural areas. Many mobility services could be provided but are unrealized due to the complexity of individual riders

trying to identify, coordinate, and pay for total trips across multiple providers. A fundamental component of providing access to rural communities is to provide a user-friendly trip planning tool that can identify trip options using both public and private mobility options, incorporating taxi services, and using the existing Volunteer Driving Programs to fill identified gaps in transportation services. IMPACT will also create public/private partnerships to allow single-fare transactions for a rider's Complete Trip using central fare software that, if successful, will not require every partner to subscribe to a single fare system. IMPACT will be able to purchase and book public transit tickets, and will enable community agency staff go online, review mobility options, and book desired modes. As all community members are not able or interested in using a digital app, IMPACT will serve as an online interface that caregivers and others can use to plan and pay for travel via multiple mobility options.

Anticipated Outcomes, Benefits, and Impacts

The successful development and deployment of the IMPACT program will provide expanded transportation options to the public by streamlining and centralizing public transit coordination in a one-call/one-click format using a customized app. It will also increase community awareness of mobility options and provide greater access to critical services and opportunities for rural and deeply-rural riders. The program will be designed to be scalable and customizable to provide a template that can be applied/expanded to other rural areas both inside and outside the Northeast Minnesota Arrowhead region. Introducing innovative technology and effective community engagement will increase efficiency, expand quality, promote safety, and improve the passenger experience. By expanding mobility options, those who may not currently have accessibility options will gain new mobility options and experience reduced isolationism and an increase in personal self-worth.

GoWake Access Microtransit
Wake County, NC

Team and Budget

Key Partners: Wake County, City of Raleigh, Capital Area Metropolitan Planning Organization

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$393,527	$168,655	$562,182

Innovation: Project Approach

Wake County has more than 30 years of experience working with private transportation firms for the operation of rural paratransit services in addition to partnering with private transit software firms for advanced state-of-the-art automation of routing and scheduling. Thus, its staff are well-trained, experienced, effective, and efficient in collaborating and partnering with the private sector for the provision of public transit services.

This project will provide a unique opportunity to address the growing trend in rapidly-growing urban areas where lower-income populations are having to move outside the urban core due to gentrification, thus pushing them away from regularly-available public transit services. Instead of a first/last mile approach, this project will investigate a "first five-mile/last five-mile" approach to connect to more distant transit services for rural areas.

Challenges Project Is Designed To Address

In FY 2019, Wake County GoWake Access had approximately 3,128 rural general public trips originate out of the proposed microtransit service area (Rolesville, Zebulon, and Wendell). Of those trips, 2,377 were made by passengers who live in one of these three towns. Most rural public transit riders traveled to Raleigh (1,657 trips), followed by Knightdale (428 trips), Cary (333 trips), Wendell (286 trips), Wake Forest (191 trips), Zebulon (177), and Rolesville (50). Trips to other towns were far less frequent. It is significant that of the 2,377 trips, only 148 individuals used the service, which is indicative of the lack of availability in the current service design model whereby service is provided on a shared-ride basis and trip lengths are significant.

A new microtransit service model will allow for a portion of paratransit vehicles to be stationed in closer proximity to the zone, making the service more available, with minimal advanced reservation requirements (potentially within a goal of two-hour notice). Based on these trip statistics, the average one-way trip length on GoWake Access paratransit vehicles to Raleigh is approximately 14–15 miles.

The demographic estimates of those in the proposed microtransit zone (area) are as follows:

- Low-income population: 399
- Older adult population: 2,109 (age 65+)
- Minority population: 4,382
- Single or no auto ownership population: 84 (no vehicle), 1,133 (1 vehicle)
- Total population within proposed microtransit zone: 21,067
- Total transportation disadvantaged population within the proposed microtransit zone: 8,107 or 38% of the total population

Anticipated Outcomes, Benefits, and Impacts

The outcomes, benefits, and impacts to residents in the proposed microtransit zone include:

- Enhancements that enable quicker and easier trip scheduling via smartphone app or by phone call by those without access to smartphone technologies.
- More convenient service, with vehicles traveling shorter distances to link with existing transit service.
- Enhanced traveler linkages; users will benefit from expanded job opportunities, with microtransit services connecting with commuter routes to Raleigh and the entire region.
- Using mobility software, passengers waiting on a ride will get updates on arrival times.
- Service with tremendous potential to expand well beyond current 148 residents, only1.8% of the approximate 8,000 transportation disadvantage residents residing in microtransit zone.

Phase 1 – Multi-Modal Trip Planning, Customer Service, and First/Last Mile Public Transit Pilot

Tompkins County, NY

Team and Budget

Key Partners: Ithaca-Tompkins County Transportation Council (ITCTC), Tompkins Consolidated Area Transport, Gadabout Transportation Services, Center for Community Transportation (CCT), Cornell Cooperative Extension of Tompkins County (CCET), Human Services Coalition of Tompkins County, Ithaca Downtown Alliance

Other Partners: Urban Mobility, Schweiger Consulting, Rural Health Network of South Central NY, Ithaca Dispatch, Cornell University Department of City & Regional Planning, Cornell SC Johnson College of Business

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$820,000	$205,000	$1,025,000

Innovation: Project Approach

Since 2010, the Transportation Planning Unit of the Tompkins County Department of Social Services has developed concepts for a mobility-as-a-service (MaaS) model for small urban and rural areas. In 2018, the County was selected to participate in the FTA Mobility on Demand On-Ramp Program to work with the Shared Use Mobility Center (Chicago) to refine ideas into a business model. In June 2019, the MaaS model was organized into two phases, and FTA selected the County's MaaS Phase 1 proposal for the IMI Program in March 2020.

Since 1978, Tompkins County has been one of multiple key partners to successfully collaborate to organize and diversify mobility services in the Ithaca small urban area and rural towns, including:

- Organizing the county-wide, non-profit paratransit agency Gadabout, (1978)
- Developing rural multi-modal transportation services (Tompkins County, 1981–83)
- Implementing a large-employer Transportation Demand Management (TDM) program (Cornell University, 1988)
- Building a transit facility (City of Ithaca, Cornell University, Tompkins County, 1992)
- Consolidating three transit systems into Tompkins Consolidated Area Transit (TCAT) (1997, 2004)
- Establishing the local non-profit carshare company Ithaca Carshare (2006)
- Creating the community mobility education program Way2Go (2009)
- Developing a regional mobility services plan (ITCTC, 2013)
- Starting the online rideshare service Finger Lakes Rideshare (ITCTC, 2013)
- Creating the regional mobility management program MoveTogetherNY (CCETC, 2016)
- Consolidating carshare and biking/walking advocacy under an umbrella non-profit (CCT, 2018)
- Organizing the Go Ithaca TDM program (Ithaca Downtown Alliance, 2018)

These activities demonstrate a collective competency for recognizing opportunities and working together to successfully innovate.

Assisting people with trip planning, answering customer questions by telephone, computer, or text message, providing an easy- to-use smartphone app, sending links of how-to videos, resolving problems, accessing language assistance for non-English speakers, and providing ADA-accessible information modes are all essential customer services. This project will explore innovative means of providing information and trip planning more seamless by providing 24/7 access for customer service. The project will operate a call center and develop a smartphone app, and the project team will guide development of the call center. In addition, Tompkins County is currently evaluating model call centers operating in small urban/rural counties in New York State.

The project has specific requirements for the phone app to be much simpler than many of the MaaS-related apps for large metro areas. It will not have fare payment capability. Currently, real-time bus location information is limited to two public transit operators (TCAT and one of three inter-county bus services) and the operation of TCAT's First/Last Mile pilot project. Tompkins County will collaborate with a peer agency to learn more about Open Trip Planner technology. Although the trip planning and service information program helps customers discover travel options and answer questions 24/7, this project will support customers when they experience trip failures. Using the business model for a nationally-recognized, member-based road-side assistance program for automobiles, the project will develop a pilot program for customers experiencing trip failures when using community mobility services, ridesharing, and bicycling. This pilot will collect data on customer experiences and resolution of trip failures to help to create a member-based business plan for a larger program in the future.

Since 2018, TCAT and Gadabout have worked with Urban Mobility to develop a new pilot service in Tompkins County, an integration of paratransit and fixed-route transit services to allow passengers to make first/last-mile connections. The objective is to transport passengers to/from a main bus stop to their home address; however, origin-to-destination rides would be possible using Urban Mobility's smartphone app (Hypercommute) to handle logistics between TCAT and Gadabout buses and customers. In 2020, the COVID-19 pandemic delayed the start from Spring to Fall 2020 and changed the scope of the pilot. TCAT and Gadabout decided to launch a revised pilot (TConnect) starting with a Sunday-only, MOD service connecting a suburban/rural area to a large retail center in the Ithaca urban area. The pilot began on August 30, 2020.

Challenges Project Is Designed To Address

FTA's IMI Demonstration Program will help address three customer issues:

- Comprehensive, real-time information to plan and complete single and multi-modal trips.
- Customer assistance when a planned trip fails for any number of reasons.
- An inability to access rural transit service or the lack of affordable on-demand service.

Anticipated Outcomes, Benefits, and Impacts

As a result of the work through this project, travelers in Tompkins County and regional bus commuters will have more and easier ways to access travel information, plan trips, mitigate trip failures, and access on-demand mobility services in select suburban and rural communities. By providing easy access to travel information, expanding real-time mobility service data, and assisting people facing trip failures, it is anticipated that the project will reduce travel stress for all parties, especially persons who are transit-dependent, have disabilities, and are older. It is expected that a successful outcome of this pilot will provide the basis for implementing Phase 2 of MaaS by providing a seamless payment experience.

The project has specific requirements for the phone app to be much simpler than many of the MaaS-related apps for large metro areas. It will not have fare payment capability. The primary uses are to call individual mobility operators via the call center for Internet access of mobility operator apps or websites, and to access frequently asked questions and answers or to report an emergency. Currently, real-time bus location information is limited to two public transit operators (TCAT and one of three inter-county bus services) and the operation of TCAT's First/Last Mile pilot project. Tompkins County will collaborate with a peer agency to learn more about Open Trip Planner technology.

Although the trip planning and service information program helps customers discover travel options and answer questions 24/7, this project will support customers when they experience trip failures. Using the business model for a nationally-recognized member-based road-side assistance program for automobiles, the project will develop a pilot program for customers experiencing trip failures when using community mobility services, ridesharing and bicycling. This pilot will collect data on customer experiences and resolution of trip failures to help to create a member-based business plan for a larger program in the future.

Since 2018, TCAT and Gadabout have worked with Urban Mobility to develop a new pilot service in Tompkins County, an integration of paratransit and fixed-route transit services to allow passengers to make first/last-mile connections. The objective is to transport passengers to/from a main bus stop to their home address; however, origin-to-destination rides would be possible using Urban Mobility's smartphone app (Hypercommute) to handle logistics between TCAT and Gadabout buses and customers. In 2020, the COVID-19 pandemic delayed the start from Spring to Fall 2020 and changed the scope of the pilot. TCAT and Gadabout decided to launch a revised pilot (TConnect) starting with a Sunday-only, MOD service connecting a suburban/rural area to a large retail center in the Ithaca urban area. The pilot began on August 30, 2020.

Regional Cloud-Based Traffic Management AI System
Columbus, OH

Team and Budget

Key Partners: City of Columbus, Franklin County, Mid-Ohio Regional Planning Commission (MORPC), Ohio Department of Transportation, Waycare

Other Partners: Lancaster-Fairfield Public Transit, Regional Transportation Commission Services, Ohio State University, Drive Ohio, Transportation Research Center, Honda Manufacturing

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$1,725,000	$800,000	$2,525,000

Innovation: Project Approach

This project will expand on the Central Ohio Transit Authority (COTA) work on Artificial Intelligence (AI) from its current Proof of Concept in Columbus to a 13-county region in the Columbus Metropolitan Statistical Area. The counties included in the project are Delaware, Franklin, Fairfield, Knox, Licking, Logan, Madison, Marion, Morrow, Pickaway, Union, Athens, and Hocking.

COTA seeks to address innovative approaches to data sharing arrangements and data collection methods, enabling increased understanding of impacts to travelers and the community at large. It aims to unify multiple streams of traffic and transit management data on a cloud-based platform, using AI to enhance operations, improve safety and efficiency, develop new channels of communication, and explore topics surrounding transit use cases across the region. To address this challenge, COTA is deploying a cloud- based Software as a Service (SaaS) solution provided by Waycare Technologies to enable data sharing across transportation agencies, with AI to provide real-time predictive analytics.

Challenges Project Is Designed To Address

Local governments collect vast amounts of data from transportation agencies, public safety departments, researchers, consultants, and, increasingly, connected devices, including vehicles. The sheer volume of data is difficult to manage, and operations are often siloed within a particular agency, department, or application, with data rarely analyzed effectively. The challenge is compounded by much of the data being proprietary in nature and, therefore, not interoperable. Resulting inefficiencies exist despite agency leaders acknowledging that their operations would be more effective through cross-agency collaboration.

Nearly 150,000 workers commute into Franklin County from the other 12 counties in the project. By integrating multi-jurisdictional transportation and transit data onto a single platform, COTA aims to make improvements to mobility services that address the needs of all riders. The expansion will broaden the impact beyond the urban center, helping alleviate such issues as spatial mismatch, availability in suburban and rural areas, inefficient routing, and long commute times.

Anticipated Outcomes, Benefits, and Impacts

The following are anticipated outcomes, benefits, and impacts of the program:

- Improved transit service performance – Using trip data from COTA and other transit agencies, the platform will analyze the on-time performance of routes. The incorporation of data from project partners, in addition to external sources, will illuminate the factors impacting this important performance indicator. As such, transit agencies will be able to take proactive measures to address underlying issues while reducing wait times and avoiding bus bunching. These efforts are projected to reduce operational costs by facilitating consistent service.
- Increased visibility of roadway conditions – Most transportation data are derived from infrastructure. The use of data from vehicles, crowd-sourcing, and social media will provide transportation agencies with information to which public transit providers typically do not have access.
- Improved service planning – The project's real-time data analytics tools will enable COTA and other transportation agencies to accurately measure which transit routes are being used, which corridors are growing, fluctuating demographics, and even weather forecasts that can affect traffic. Transit customers will benefit from more efficient routes and other service changes driven by data, rather than often inconsistent customer feedback at public meetings or through calls to customer service departments.
- Reduction in incident response times – The project will identify and alert safety agencies of incidents on the road (accidents, hazards, etc.), which will result in faster reactivity. By centralizing the activities on one platform, transit providers will have seamless, real-time access to incident information across multiple agencies, multidisciplinary responders, and the public.
- Increased incident identification – The project will help to identify hazards and incidents that are often under-reported due to the bystander effect, which will impact the ongoing traffic safety in the area.
- Reduction of secondary crashes – Drivers in personal vehicles often fail to exhibit safe driving habits. This is particularly true in the areas around accidents and roadway events (concerts, sports games, severe weather, etc.). The project will provide drivers with access to important information distributed by verified sources, allowing them to make informed decisions about their route, thereby avoiding dangerous incidents.

EZfare: The Gateway
Cleveland, OH

Team and Budget

Key Partners: Stark Area Regional Transit Authority (SARTA), NEORide, Masabi, Transits: Laketran, Medina County Public Transit, Akron Metro RTA, Toledo Area Regional Transit Authority (TARTA), Western Reserve Transit Authority (WRTA), Lancaster-Fairfield Public Transit, Butler County RTA, Southern Ohio RTA, Transit Authority of Northern Kentucky, Sandusky RTA

Other Partners: Cleveland State University (CSU), CalStart

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$1,997,503	$1,724,190	$3,721,693

Innovation: Project Approach

SARTA, in partnership CalStart, NEORide, Masabi and CSU, will collaborate with multiple stakeholders to meet Area of Inquiry 3, Mobility Payment Integration, to develop an innovative alternative payment system for mobility, business, and personal applications targeted to significantly benefit unbanked, underbanked, low-income, disadvantaged, disabled, student, older adult, and other underserved populations.

Partners and stakeholders sought to be involved in this project include regional public and private transit and transportation providers, shared mobility companies, financial institutions/merchants, local businesses, community-based and non-profit organizations, schools and universities, government agencies, and social service and healthcare organizations who work with the program's target populations.

This project will demonstrate an innovative approach to increasing public transportation effectiveness and equitable access to services to underserved populations that include the unbanked and underbanked, those without access to mobile devices and human service transportation users, among others. SARTA proposes to demonstrate an integrated, alternative payment system based on Masabi's EZfare technology and Smart Cards, which will be used for multiple transit and non-transit applications and to centralize and unify public transit fare-purchasing processes throughout the region (via the "Multi-pass" function). The Multi-pass will involve developing revenue-sharing agreements among the transit agency partners. This same payment system will be accepted by alternate transportation providers such as non-emergency medical, shuttles, taxis, carshare and bikeshare, among other mobility applications.

In the first year of the three-year project period, SARTA and its partners (project team) will conduct project planning that includes significant stakeholder engagement to develop multimodal mobility strategies, program policies and procedures, a full data management plan, training processes and materials, and conducting user/partner surveys. It will also include software integration, hardware installation, and policy and technology alignments necessary to implement the payment system seamlessly with all desired project partners.

In the second year, the project team will begin implementing the program with transit and mobility partners by conducting partner training, program marketing, payment systems operations, revenue sharing activities and ongoing program operations data collection and validation.

In the third year, the project team will complete data collection, management, and analysis and will share project data, analyses, and reports with FTA, project partners, industry, and the public.

During the three-year project period, the project team will continue planning activities in coordination with stakeholders to move towards integrating universal, single payment accounts across multiple non-transit/non-mobility services.

PICK Mobility on Demand
Big Cabin, OK

Team and Budget

Key Partners: Routematch, JAMM Transit (operated by INCA Community Services, Inc.), Cimarron Public Transit System (CPTS) (operated by United Community Action Program, Inc.), KI BOIS Area Transit System (KATS)

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$1,514,479	$1,927,521	$3,442,000

Innovation: Project Approach

This project is led by a consortia of public transit agencies seeking to provide rural communities in eastern and north central Oklahoma (OK) with access to spontaneous service as well as transformational engagement, booking, and payments technology. The project, named for the partnership of four rural public transit agencies, including Pelivan Transit/Northeast Tribal Transit Consortium (operated by Grand Gateway Economic Development Association), JAMM Transit, Cimarron Public Transit System (CPTS), and KI BOIS Area Transit System (KATS, operated by KI BOIS Community Action Foundation, Inc.), will provide on-demand public transportation services in 21 rural communities across their combined 28 rural county service area, covering approximately one-third of Oklahoma.

The project will operate extended hours from current regional demand-response transit services, from 5:00–10:00 PM Monday–Friday, and 10:00 AM–2:00 PM Saturday. Despite being operated by four distinct transit agencies, the new mobility service(s) will be promoted as one brand to the public. Offering an inclusive wayfinding, booking, and payments experience across such a large region will allow significant learning about the possibilities of public mobility in at least four areas:

- The scale and breadth of the pilot will offer the best opportunities yet to identify operational improvements over traditional models.
- The single MOD brand will offer an innovative model for regional trip coordination and integrated regional payments.
- The rider-centric data collected will allow for deeper analysis related to community outcomes.
- The commitment to elevated standards for driver training, outreach, and customer engagement will allow for separate impact measurements on both ridership and individual dignity.

Each partner will provide operations for the project, with a singular and consistent marketing brand, using 41 Americans with Disabilities Act (ADA) compliant vehicles, customer access to PICK MOD services through a mobile app, a single branded website, and the regional Mobility Management Call Center. The project will leverage Routematch's Mobility Platform, including self-service tools that meet Web Content Accessibility Guidelines (WCAG) 2.0 standards. In addition to accessible apps, the technology includes agency management tools for service zone creation, trip/service configuration, regional ecosystem visibility, and payment services. It also automatically manages all scheduling and driver workflows. The new technology will also enable cash collection and account management for unbanked and underbanked riders.

Challenges Project Is Designed To Address

The project's goals are to (1) provide new multi-agency rural and regional on-demand public transit services in 21 communities, (2) provide riders with one unified customer experience from trip scheduling to integrated payments, and (3) expand equal access to rural public transit services for targeted populations. These goals reflect the regional partners' interest to address customer needs identified in the 2019 Regional Transit Needs Survey, in which respondents cited interest in new after-hours transit services, access methods, and electronic payment options. Of 725 customer surveys completed, 54% of respondents requested new weekday and weekend transit services, 47% preferred use of a mobile app to manage services, and 50% indicated interest in mobile fare payment systems. The PICK MOD services will enable approximately 2,000–37,000 residents in the selected communities to access healthcare, recreation, shopping, library, continuing education, employment, addiction recovery programs, and other interests. The project's regional coverage will be expansive, with the potential to scale into a statewide model.

Anticipated Outcomes, Benefits, and Impacts

The PICK MOD project seeks to make available accessible on-demand public transit services in 21 communities across eastern and central Oklahoma using four regional rural public transit partners and advanced Intelligent Transportation Systems (ITS). Anticipated project goal-related outcomes include the following:

- New "customer-centric" public transit services provided in 21 rural communities based on stakeholder input to design and develop a new, accessible on-demand transportation service. The MOD service has been designed by the project partners with stakeholder and customer input considered from initial concept through feedback received in the recent 2019 Regional Transit Needs Survey. The project will have an immediate positive impact on the mobility options available to all 264,990 citizens in the participating 21 rural communities and represents the first new public transit services to operate in these communities on weekday evenings and Saturdays, enabling a new public mobility option to meet local interests.
- Attracting new customers with innovative services and technology is an essential outcome for the project. Enabling this outcome is the provision of an innovative, new on-demand transit service design, brand, technology, and the provision of services outside traditional partner hours of operation. In providing on-demand services, the partners will appeal to their existing customers and provide additional immediate mobility options for new riders to access community services. In addition, accurate and timely information, rapid deployment of resources, and predictive scheduling and routing technology advancements will enable the partners to provide, and customers to experience, on-demand services. The use of new, innovative mobile and online technology will provide customers with an increased sense of ownership to create a profile, schedule trips tailored to customer abilities, manage day-of and seven-day advance services (trip confirmation, real-time arrival status/location), and conveniently pay for services. The on-demand service will also enable customers experiencing the service's public transit safety and security measures (mobile app, vehicle logo identification, driver uniforms, etc.) to improve confidence experiencing the new services. Partners will make all customer services available through a mobile app, online, telephone, and in-person, ensuring multiple communication options for all persons to access PICK MOD services.
- Equal customer access to on-demand transit services through the provision of innovative on-demand services, multiple communication/access methods, and advanced technology is an expected project outcome.

The PICK MOD project is expected to improve customer quality of life by enabling access to mobility through new weekday evening and Saturday on-demand transit services. In addition, through the use of new, innovative technology, customers will feel more confident about using MOD services in managing their own trip, including scheduling, pick-up, and real-time vehicle arrival awareness, providing a "customer-centric" approach.

Steps to MOD and MIPI
Portland, OR

Team and Budget

Key Partners: IBI Group, Fehr & Peers, INIT, VISA, Clevor Consulting Group, moovel, Ready Credit Corp., Uber, PLUS QA, City of Portland, Nelson/Nygaard

Other Partners: Cambridge Systematics, Smart Columbus, Contra Costa Transportation Authority, Oregon Metro, Oregon Department of Transportation, Portland State University Transportation Research and Education Center, Regional Transportation District (RTD) Denver, State of Vermont Agency of Transportation

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$1,812,282	$890,615	$2,667,897

Innovation: Project Approach

TriMet strives to empower all travelers, not just those who are tech savvy, to discover, plan, book and pay for the ever-increasing mobility options in the Portland region and achieve a seamless, low-stress, Complete Trip experience. To advance the vision of a frictionless mobility experience, TriMet will develop technology and partnership protocols to provide information, trip planning, payment, and travel that can encompass transit and all other available modes for customers. This IMI Demonstration Project will help realize this vision by achieving several fundamental steps, including innovative payment, customer experience, and mobility data.

This project will build upon TriMet's history of innovation in transit data and technology. TriMet was a key player in the development of the General Transit Feed Specification (GTFS) and the OpenTripPlanner (OTP) project. As a participant in FTA's 2016 MOD Sandbox Demonstration Program, TriMet expanded OTP to incorporate ridesourcing providers, bikeshare, carshare, and e-scooters.

In July 2017, TriMet, along with C-TRAN (Clark County, WA) and Portland Streetcar, launched Hop Fastpass™ (Hop™), the Portland region's first electronic transit fare payment system. Hop™ is an account-based fare system with a number of industry-leading features, including open application programming interfaces (APIs), open payments, virtualized fare cards, and fare capping. The open architecture design of the Hop™ system allows for fare policy innovation and the potential for future payment integration for other TriMet services or for other mobility provider services. These initiatives form the foundation upon which this project will build, moving the Portland region one step closer to the future vision of Mobility on Demand and Mobility Payment Integration.

This project will explore innovative means of making the multimodal trip payment experience more seamless for customers by building on TriMet's groundbreaking Hop Fastpass™ system. A seamless payment experience can be enabled either by integrating payment for multiple modes into a single transaction through the Hop™ system, by enabling open payment with a credit card or mobile payment (ApplePay/Google Pay), or through a hybrid approach. This effort will explore several avenues by outlining the business case for integrated payment, expanding open payment functionality within the Hop™ system, expanding the accessibility and functionality of

the Hop™ smart/virtual card systems, including an analysis of which options best leverage open source capabilities and benefits, and improving access for the unbanked/underbanked.

This effort largely will build off of TriMet's multimodal trip planner. Whereas the trip planning tool helps customers discover travel options, this project will help nudge customers towards accessing and using the increasing mobility services in the region and will address travel stress with better transit vehicle arrival predictions. It will also move beyond technical solutions to explore an empathetic approach that meets customers where they are, regardless of their travel preferences or level of technical expertise.

To help understand the impact of MOD and MPI initiatives, this project will work to define a framework of metrics for assessing transit quality beyond traditional measures, incorporate consistent measurements into data sharing agreements, establish the qualitative and quantitative metrics to evaluate the effectiveness of the innovative payment and customer service, create an analytical methodology to evaluate barriers to effective service for Complete Trips, and apply the framework and benchmarks for analysis of the initiatives proposed above, with the goal of understanding the extent to which innovations in payment technology and incentive programs can actually drive changes in travel behavior.

Challenges Project Is Designed To Address

TriMet's steps to the MOD and MPI project will make critical progress towards advancing the vision of a Complete Trip for All through payment innovation, improved real-time information, seamless integration of tools, and better mobility management metrics. This work is timely and necessary due to several challenges facing the transit industry in this era of new mobility. There are more transportation options than ever, but they are not equally accessible to all, and typically only those who are tech savvy can figure out how to combine them. Further, in some places and at some times, transit riders also rely on new modes that offer convenient mobility on demand, and the transit industry must adapt to maintain its relevance. These new modes have great potential to complement transit and help people become less dependent on private automobiles, but to realize this potential, agencies must help their existing riders and new markets of potential riders discover the benefits of multimodal trips.

When scaled, multimodal travel could be truly transformative, especially in less densely-populated areas where it is difficult to provide high-quality transit. Due to the suburbanization of poverty, many who are transit-dependent now live in such areas and have much to gain from seamless multimodal transit. Multimodal travel could also reduce congestion in cities, helping to reverse increases in bus travel times seen in many regions make transit more attractive and would also provide environmental and economic benefits.

Another challenge facing the industry is a limitation on the resources needed to meet customer demand for the latest technology products and services. Travelers increasingly desire a modern, mobile-friendly travel experience that requires minimal advance planning and technical skills. Developing and maintaining such systems is costly, challenging, and beyond the reach of many agencies. By pooling resources in open source projects, however, platforms such as the OpenTripPlanner (OTP) and an eventual plan/book/pay experience become possible. The sheer number of distinct third-party mobility providers also presents a challenge to integration. These new mobility providers have yet to converge on a single data-sharing standard, making it difficult to advance an integrated travel experience.

Anticipated Outcomes, Benefits, and Impacts

As a result of the work through this project, travelers in the Portland metropolitan area will have more and easier ways to pay for their travel, as well as improved real-time transit data among other customer experience enhancements. By providing a more seamless payment environment and exploring extending open payments options to more groups, paying for transit and multimodal journeys will become more accessible. Additionally, providing enhanced real-time transit data will reduce travel stress for all parties, especially the transit-dependent, persons with disabilities, and older individuals. Reducing travel stress and providing a more seamless payment experience benefit not only the customers but also transit providers, as the more reliable and easier the system is to use, the more likely it is to be used.

Rural Integrated Payments Program
Crawford County, PA

Team and Budget

Key Partners: Crawford Area Transportation Authority (CATA), Ecolane, Avail Technologies, Masabi

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$715,233	$255,484	$970,717

Innovation: Project Approach

CATA has been a prominent fixture in Crawford County since 1979. Incorporated as a municipal transit authority, it offers a variety of services to all of Crawford and Venango counties. CATA services include fixed-route bus service in the cities of Meadville, Titusville, Saegertown, Franklin, Oil City, and Seneca and door-to-door transportation throughout the two counties.

CATA's proposed Rural Integrated Payments Program will enable CATA to integrate ticketing and payments across paratransit and fixed-route service, thereby creating a more cohesive rider experience and enabling the agency to encourage intermodal travel. Agency data will be enhanced by integrating Computer-Aided Design/Automated Vehicle Locator data through CATA's existing General Transit Feed Specification (GTFS)-Real Time and GTFS feeds, enhancing ticket usage data with stop, route, and trip data. The proposed solution will also introduce electronic ticket validation across CATA's fleet, ensuring that data can be effectively and automatically collected.

The project will provide a cost-effective micro-transit platform, providing the opportunity for riders to plan, book, pay and validate across all modes that CATA provides.

Challenges Project Is Designed to Address

At present, paratransit and fixed-route service provision within CATA is largely managed independently, with limited opportunity for providing an integrated multimodal service. Proposed technical solutions for integrating paratransit and fixed-route services have been investigated but are outside budget availability at smaller, rural transportation agencies such as CATA. The project will provide an integrated method of scheduling, booking, and purchasing flex and fixed-route services and will provide the data required to fully understand the collective needs of CATA riders. With this level of data quality, CATA will be able to identify changing demand and provide service improvements to meet the needs of all riders.

Anticipated Outcomes, Benefits, and Impacts

The pilot project will provide options for small and rural transit agencies to deliver fully-integrated and efficient fixed- and flex-route services. The resulting platform will provide a body of data that will enable CATA to plan for rider needs.

Expanding Rural Access to Non-Emergency Medical Transportation

Pierre, SD

Team and Budget

Key Partners: River Cities Public Transit (RCPT), Avera St Mary's Hospital

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$401,760	$100,440	$502,200

Innovation: Project Approach

The proposed project will build and expand upon the limited scope of existing integrated transit services provided in partnership between RCPT and Avera St. Mary's Hospital. Through this established partnership, RCPT and Avera St. Mary's Hospital will leverage the hospital's volunteer drivers to provide rides free of charge to qualifying oncology patients residing in Pierre and Fort Pierre to and from the Helmsley Center on Avera St. Mary's Hospital campus. The partners launched a small-scale pilot of the proposed project in December 2018 in Gettysburg, approximately 60 miles from Pierre to accommodate qualified patients who cannot afford and/or access transportation for their medical appointments.

This project will significantly expand the scope of existing transit services presently provided to oncology patients to all patients, irrespective of the type of medical care needed and sought. The proposed project will also expand the serviceable geography from the communities of Pierre and Fort Pierre to RCPT's local service area of 11 counties. The proposed project will also provide medical transit services to the American Indian Reservations of Crow Creek, Lower Brule, and Cheyenne River. A fleet of volunteer and paid drivers will accommodate the expansion of the geography served, primarily serving the communities of Pierre and Fort Pierre with outreach up to a 60-mile radius. To support the fleet of volunteer drivers and help prevent volunteer burnout, paid drivers will service the proposed geography lying outside of the 60-mile radius within the proposed serviceable geography.

Because individuals with disabilities may require more routine and ongoing medical care, it is of paramount importance that they can readily access integrated mobility services to make it to routine medical appointments. Lower-income individuals face even greater obstacles taking time off from work and leveraging income to pay for transportation services. As part of the proposed project, patients demonstrating financial need will qualify for free transit services to and from non-emergency medical appointments. Identifying those in need of free transit services will be facilitated by Avera St. Mary's Hospital's Transportation Coordinator. By expanding the serviceable geography, the proposed project will directly impact and benefit several underserved communities. The planning stage will explore ways to develop a three-tier payment system that can be sustainable.

The proposed project will serve patients of all ages, including those with disabilities, and both volunteer and paid drivers will be trained to safely and efficiently transport them. Expected outcomes of the proposed project include the ability for patients to access needed medical services without placing a burden on caregivers to transport them. Both patients and caregivers will be able to remain engaged in their own

communities and work places where their support systems are located vs. spending weeks or months elsewhere to access and receive needed medical treatment.

The proposed project will builds off an innovative and integrated approach to increase mobility for all for accessing non-emergency medical care. Additional stakeholders have expressed support for the expansion of transit services provided through an established collaboration between RCPT and Avera St. Mary's Hospital. Mobility management will be a key strategy used to expand the project to include other medical entities in South Dakota. Throughout the project period, RCPT and Avera St. Mary' Hospital will leverage technology to provide seamless coordination of transit services for patients served.

Challenges Project Is Designed To Address

The goal of the project is to remove obstacles rural patients regularly encounter when accessing transportation to non-emergency medical appointments. Leveraging an existing partnership between RCPT and Avera St. Mary's Hospital, the project will build upon current efforts to bridge local transit services and the local healthcare infrastructure to pilot a replicable and sustainable integrated mobility program. RCPT's technology platform for scheduling rides will be accessible to Avera St. Mary's Hospital in Summer 2019 to allow for more seamless coordination of services. This common technology platform will be leveraged to schedule transit services as part of the proposed project. Funding will allow Avera St. Mary's Hospital to hire a full-time Transportation Coordinator to help advocate the proposed services for qualifying patients and to streamline appointments, increasing efficiencies for patients, volunteers, and RCPT paid drivers.

Anticipated Outcomes, Benefits, and Impacts

By the end of the project period, it is anticipated that Avera St. Mary's Hospital will observe reductions in no-show rates for non-emergency medical appointments among the qualifying patient population, the number of hospital readmissions among the qualifying patient population, and Emergency Department visit rates among the qualifying patient population. By the end of the project period, it is anticipated that RCPT will observe an increase in the number of non-emergency medical transit rides provided. RCPT has estimated that the cost for operating a vehicle with volunteer service at $0.55/mile; for paid drivers the cost may be $1.50/mile. Data will be collected in the pilot project to verify these numbers. It is estimated that the average miles per trip of the proposed project will be 75 miles, which will be verified throughout the period of performance. The pilot project will establish a benchmark for percent of on-time performances, which will be compared for volunteer and paid drivers.

Bowtown/Westwood Microtransit Pilot
Memphis, TN

Team and Budget

Key Partners: TransLoc, Innovate Memphis, University of Memphis, Marlene Connor & Associates

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$394,000	$496,000	$890,000

Innovation: Project Approach

The Memphis Area Transit Authority (MATA) is the transportation service provider for the Memphis area, including portions of the cities of Bartlett and Germantown, covering an area of 280 square miles in Shelby County. Services provided include fixed-route bus, paratransit, and vintage rail trolley. The service area has a population of 714,044, of which more than 83% is within a half-mile of a bus route. With a core mission that includes connecting people to places, MATA provides fixed-route bus service on 45 routes and paratransit service throughout its service area and rail trolley service in the downtown Memphis area. MATA maintains a fleet of about 200 vehicles, and several of its 45 routes are designed primarily to connect residents to major employment centers in the Memphis area.

In this project, MATA will develop a pilot microtransit service with an accompanying mobile app that will allow customers to book a ride and access information on multimodal trip planning for first/last mile connections with a specific destination or to fixed-route service. Customers who do not have access to a smartphone will have the option to request service through a call center.

The proposed MATA microtransit project will enhance the level of connectivity throughout the transit network, thereby decreasing the first/last mile challenge facing public transportation users and allowing users to smoothly complete their trip from their point of origin to their final destination. This project with the mobile app will allow MATA to efficiently and effectively use technology to provide a multimodal travel planning service to residents in the Boxtown/Westwood service area.

Challenges Project Is Designed To Address

The Boxtown/Westwood neighborhood has many challenges that make it difficult to provide traditional fixed-route service. The targeted area lacks a main arterial street and consists of winding, low-density residential streets currently served by the Route 38 Boxtown/Westwood bus. Route 38 carries only 3–6 bus riders per hour, and annual operating costs are nearly $500,000. In addition, there is no access to fixed-route service within reasonable walking distance, and 30% of the population is age 64 or older.

Although MATA has maintained a basic level of coverage, the street network of narrow streets, dead ends, and cul-de-sacs make the area expensive and inefficient to serve with traditional fixed-route transit. MATA currently provides service 5:30 AM–6:50 PM on weekdays and 6:00 AM–6:30 PM on Saturdays with 90-minute headways. The proposed project is designed to address the challenges noted above by creating an on-demand service that will transport customers to a specific destination, fixed-route service, or transit center.

Anticipated Outcomes, Benefits, and Impacts

Expected outcomes of the proposed project include providing a suitable first/last mile transit option that serves as a feeder to the fixed-route transit network, decreasing average travel time to work and major thoroughfares for Boxtown/Westwood residents, decreasing MATAPlus use in ZIP code 38109 by encouraging ambulatory MATAPlus customers to use the on-demand service for local trips, increasing connectivity to existing routes, providing a Complete Trip, and providing on-demand service to customers who lack immediate access to Wi-Fi.

The benefit of an on-demand service allows MATA to provide an efficient service that will effectively meet and recognize the diverse transportation needs of the users in the target area. Expected impacts include provision of an affordable, equitable, and accessible mobility option, an improved quality of life for residents, and an improved customer experience.

Arlington RAPID (Rideshare, Automation, and Payment Integration)

Arlington, TX

Team and Budget

Key Partners: City of Arlington, Via Transportation, Inc., May Mobility, Inc., University of Texas at Arlington

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$1,698,558	$1,146,925	$2,845,483

Innovation: Project Approach

Arlington is located in the middle of the Dallas-Fort Worth metropolitan region, one of the fastest growing regions in the US. It is the 48th largest city in the country, with a population of nearly 400,000 residents in an area of 99 square miles. Over the past few decades, Arlington has transitioned from a bedroom community to a core city, with the growing University of Texas at Arlington (UTA) campus and major employers, such as General Motors and Texas Health Resources, as well as a thriving Entertainment District that attracts more than 14 million visitors to Arlington each year.

In December 2017, Arlington launched a comprehensive, fully on-demand transit solution powered by Via, which uses a fleet of six-passenger vans to provide $3 rides anywhere within the service area. The service operates Monday through Friday 6:00 AM–9:00 PM and Saturday 9:00 AM–9:00 PM. Riders without a smartphone can call a local telephone number to book a ride with a customer service agent. Fares are paid with credit or debit cards, and prepaid cards are accepted for riders who are not traditionally banked. Via has several wheelchair accessible vehicles (WAV) operating on the platform, and riders can request a WAV and door-to-door service, as necessary. Arlington has also completed two autonomous vehicle (AV) pilot programs, which operated in the Entertainment District using Society of Automotive Engineers (SAE) Level 4 vehicles. Both services were open to the general public and free to ride, allowing residents, visitors, and City staff to learn more about AV technology. The first pilot used two EasyMile vehicles on an off-street route, and the second pilot was a partnership with Drive.ai operating on-street in mixed traffic at speeds of up to 35 mph.

The Arlington RAPID project will combine the City's expertise with on-demand rideshare and AV testing to demonstrate the integration of a shared, dynamically-routed Level 4 AV fleet into an existing public rideshare transit system. Via Transportation, Inc., through its wholly-owned subsidiary, River North Transit LLC, will continue to provide the rideshare service, and May Mobility, Inc., will provide the AV technology and fleet. Both the rideshare fleet and the AV fleet will include a WAV, making this service more widely accessible. In partnership with UTA, the service will be integrated with UTA's fare payment system, allowing students to ride for free. This project will create a one-stop-shop for mobility needs in the service area concentrated around UTA's campus, providing a seamless trip planning, booking, and payment experience across modes.

The project will span 2.5 years, with the first year dedicated to programming, route mapping, testing, and customer education. The second year will include a full 12-month deployment of the integrated services, along with continued customer education, data sharing and analysis, ridership surveys, and service evaluation. The

final six months of the project will wrap up evaluation and focus on final reporting and widely sharing lessons learned.

Challenges Project is Designed to Address

Arlington's RAPID service will be available to the general public, targeted specifically to the UTA community. With more than 100 buildings spanning 420 acres, UTA is tasked with transporting students, faculty, and staff across its widely spread-out campus while accommodating users' unique needs. In addition to the UTA campus, the service area contains various residential uses and the city's commercial downtown. Home to more than 11,800 people, the service zone has a poverty rate of 39%, compared to 16% city-wide, and 18.8% of households have a person with a disability. Approximately 11% of households lack access to a personal vehicle, almost three times higher than the citywide average of 4.3% of households.

RAPID service will address needs in the service area by providing an on-demand service that can be flexible to both student and resident mobility needs. The project will demonstrate how AVs can enhance the safety, reliability, accessibility, and efficiency of Mobility on Demand networks. By removing human error from operations, AVs lower the likelihood of crashes, enabling safer trips on pedestrian- and bicyclist-filled streets. Furthermore, by connecting the AVs to one another through Via's platform, the fleet will be optimized to ensure that each shuttle is dynamically dispatched to meet real-time demand throughout the service area.

In addition to serving students and the general public, the AV fleet will include at least one WAV to expand accessibility to individuals with limited mobility; the project will demonstrate how on-demand AVs can deliver a Complete Trip to individuals with disabilities and offer efficient, sustainable service models.

Anticipated Outcomes, Benefits, and Impacts

The Arlington RAPID deployment will deliver a more flexible, efficient, and integrated transit system that provides convenient mobility for all riders. This service will improve road safety, expand transit options for riders with limited mobility, and make Arlington's existing rideshare platform more efficient, all through a single user platform that enables a seamless mobility experience. By unlocking free, convenient rides for UTA students, the service will especially benefit students traveling in and around campus and Arlington's downtown. As a result of this project, the City anticipates operational efficiencies and an increase in public transit ridership. In addition to the direct benefits to the Arlington community, the project will generate insights to advance AV and Mobility on Demand practices across the public transit industry. Project outcomes include:

- Increased access for older adults, students, and individuals with limited personal mobility
- Improved equity and accessibility to public transit
- Improved safety and efficiency
- Demonstration of automation on an existing public transportation system
- Demonstration of integrated ride booking and payment between modes
- Use of public-private partnerships for demonstration, data sharing, and knowledge transfer

Virginia Rural Microtransit Deployment Initiative
Gloucester County, VA

Team and Budget

Key Partners: Virginia Department of Rail and Public Transportation, Bay Transit, Mountain Empire Older Citizens, Inc.

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$160,930	$68,979	$229,909

Innovation: Project Approach

The Virginia Department of Rail and Public Transportation (DRPT) is the Virginia transportation agency responsible for the receipt, allocation, and management of FTA formula funding programs that flow through states. DRPT is leading the microtransit deployment effort by working closely with two rural transit agencies that will implement microtransit service on two separate transit routes. The project will include engaging subject matter experts and partnering with a microtransit Software as a Service (SaaS) mobility partner to implement and test rural microtransit concepts. The two partner transit agencies are:

- Bay Transit, a division of Bay Area Agency on Aging, a rural transit service provider operating in Virginia's tidewater region. Bay Transit is the public transportation provider for the 10 counties in the Middle Peninsula and Northern Neck in Virginia. The agency provides curb-to-curb, on-demand transportation to all residents within its service area and also offers deviated fixed-route service in Gloucester County and in the towns of West Point and Tappahannock. This project will add microtransit technology to the existing HiveXpress deviated fixed-route service that operates in Gloucester.
- Mountain Empire Transit, a division of Mountain Empire Older Citizens, Inc. (MEOC), a rural transit service provider operating in the southwest region of Virginia. MEOC operates demand-responsive transit service in three counties and the city of Norton and deviated fixed-route service in the town of Wise. The project will add microtransit technology to the existing Cavalier Connection deviated fixed-route service that operates around the University of Virginia's College at Wise campus.

An SaaS mobility partner will be engaged to provide service planning and modeling, smartphone integration, operator training, and any necessary hardware and software installations to Bay Transit and MEOC prior to implementation. Both agencies will use existing transit vehicles, drivers, and support staff to administer the service. The use of current transit resources will reduce implementation costs, simplify adoption, and allow agencies to enhance their community presence by incorporating new technology into existing service. Similar public-private microtransit partnerships have emerged in states such as Colorado and Texas, and outreach to potential providers indicates an interest from the private sector in continuing to form such partnerships. The partnership will provide access to technical experts who deploy simulator tools to better define service output prior to implementation and analyze service impacts post-implementation.

A key component of the microtransit technology will be the route optimization tool, which will receive real-time trip requests and dynamically change driver manifests to operate in the most efficient manner. The full

implementation of this service model will lead to an increasingly reliable, efficient, and affordable mobility option for riders.

Challenges the Project is Designed to Address

The delivery of rural transit service using a deviated fixed-route model can be expensive to operate and has limited spatial or temporal coverage. This project seeks to address these challenges and provide a case study for how microtransit can be implemented successfully in a rural environment.

Anticipated Outcomes, Benefits, and Impacts

The deployment of microtransit technologies in the rural transit environment will provide opportunities to study how effective rural microtransit can be at delivering an enhanced customer experience while improving operating efficiencies and expanding access to service.

Serving a Small City with Vans on Demand
Whatcom County, WA

Team and Budget

Key Partners: Whatcom Transportation Authority, City of Lynden

Other Partners: Lynden Public Library, Family Care Network

Budget Summary:

IMI Demonstration Federal Amount	IMI Local Cost Share	Total Cost
$719,388	$179,847	$89,235

Innovation: Project Approach

Whatcom Transportation Authority (WTA) provides fixed-route, paratransit, rural dial-a-ride, and vanpool service in Whatcom County, located in the northwest corner of Washington State and home to Bellingham, several smaller towns and rural communities, the Lummi Indian Reservation, and the Nooksack Trust Lands.

The scope of this project is to test whether an on-demand service could increase the effectiveness and use of public transportation in a small city. This project will provide on-demand service to residents in the small city of Lynden; using a mobile app, residents will be able to hail a ride to any destination within the city.

WTA staff will purchase software and operate the mobile scheduling app. Service will be provided by WTA drivers in WTA-owned wheelchair-accessible vans. Although on-demand service will be open to everyone, marketing will focus on older adults, parents of school-age children, people with disabilities, and people with limited income.

Challenges Project Is Designed To Address

Like many agencies that serve both urban areas and small cities, WTA finds the standard offerings of fixed-route and paratransit service, which meet people's needs extremely well in WTA's densely-populated areas, do not meet the needs of residents of small cities. Lynden has a population of nearly 15,000 and covers 5.4 square miles. Approximately 23% of the population is over age 65; of those, 13% are below the poverty level. Lynden has a small, vibrant downtown, numerous medical facilities, and two grocery stores. Whereas the fixed-route bus serves the need of connecting people to the nearest larger town, it does not connect all points within the city.

WTA currently serves Lynden with one fixed-route bus that runs on a 90-minute headway. Although WTA recognizes that this level of frequency reduces convenience, the demographics and population density of Lynden do not warrant greater frequency. Even for those who can access WTA's fixed route, service is limited. For those who live outside the fixed-route service area, mobility options are extremely limited. Another challenge is the fact that Transportation Network Companies (TNCs) such as Uber and Lyft have limited or no service in many small towns. This project will assess the successfulness of an on-demand service run entirely in-house.

Anticipated Outcomes, Benefits, and Impacts

The goal of this project is to improve access to—and the convenience of—public transportation within a small town. WTA will target older adults, school-age children, people with disabilities, and people with limited income. The project will expand public transportation options within Lynden and enhance traveler ability to connect with public transit outside of Lynden. This project will advance FTA's vision of a Complete Trip for All. By increasing the number of people able to begin a "chain of steps, beginning with an often-spontaneous decision to make a trip," this project could turn lost opportunities into expanded mobility, especially for people who do not drive, do not live near fixed-route service, or who are not eligible for paratransit.

This project will improve individual travelers' ability to access medical appointments, shopping, faith-based activities, recreation, and social opportunities. This improved access, especially for older adults, school-age children, people with disabilities, and people with limited income, can improve the quality of life for individuals as well as the community. This project could also benefit the community by reducing problems associated with lack of access to reliable transportation—for example, missed medical appointments and limited participation in social services.