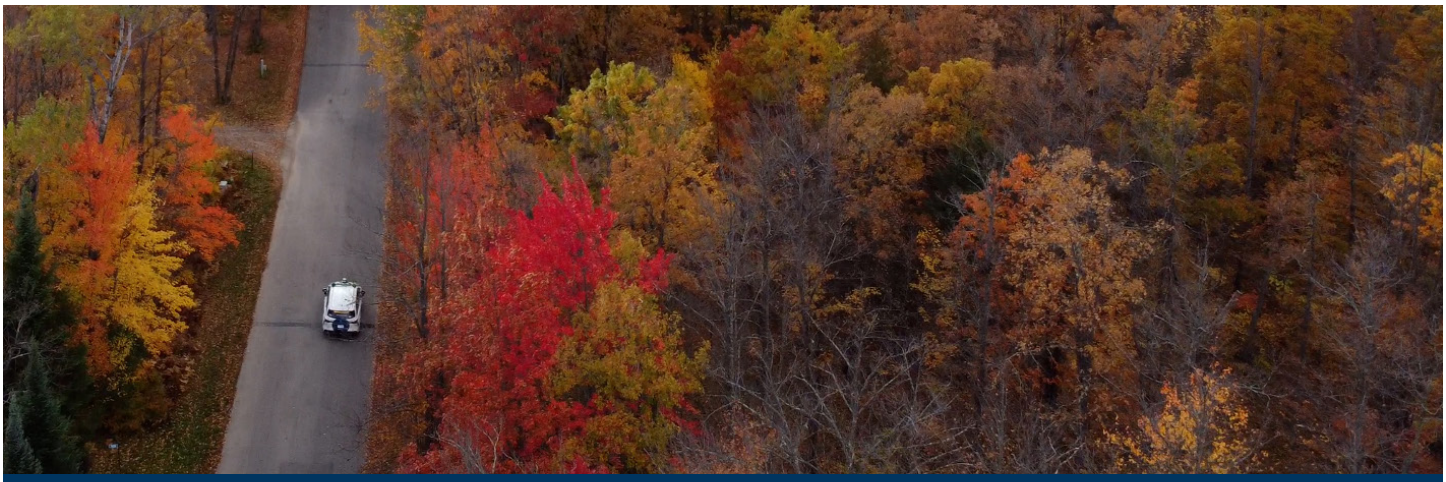
POLICYMAKER SUMMARY

DEPARTMENT OF TRANSPORTATION

CENTER FOR TRANSPORTATION STUDIES
UNIVERSITY OF MINNESOTA



THE GOMARTI SELF-DRIVING SHUTTLE PILOT PROGRAM

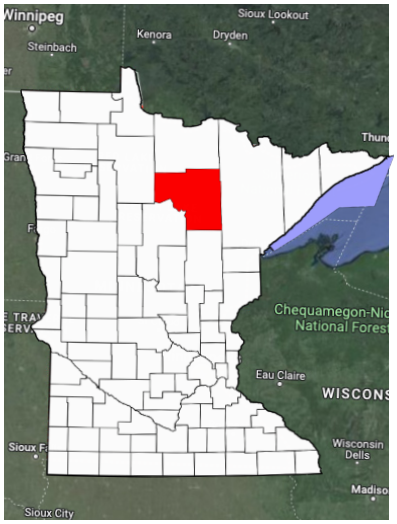
Lessons Learned and Next Steps for Minnesota's Autonomous Rural Transit Initiative

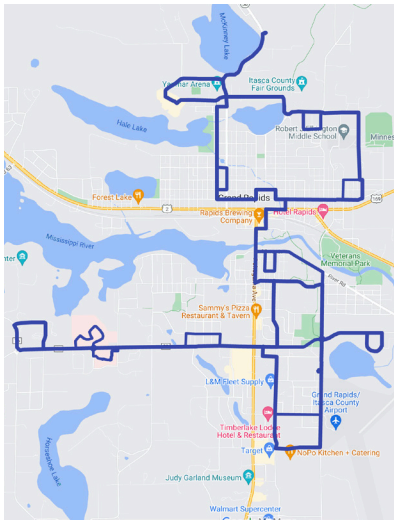
GOMARTI BY THE NUMBERS

(as of May 31, 2024)

- 5 shuttles operating along a route of more than 46 lane miles
- 24 months of shuttle operations (extended from 18 months)
- $0 = cost of a goMARTI ride during the pilot program
- 10,000+ riders
- 750+ wheelchair-accessible rides given
- 150,000+ total miles driven
- 92% repeat riders
- 41% of riders did not use a personal vehicle as their primary mode of transportation
- 96% of riders surveyed would recommend goMARTI to family and friends

In October 2022, five self-driving shuttle vans rolled onto the streets of Grand Rapids, Minnesota, as part of a first-of-its-kind demonstration. The 18-month Minnesota Autonomous Rural Transit Initiative (goMARTI) pilot offered free, on-demand rides to Grand Rapids residents and visitors. Rides were provided by a fleet of Toyota Sienna Autono-MaaS vans—three of which were wheelchair-accessible with an ADA-compliant ramp. The service covered nearly 17 square miles and included about 75 pickup and drop-off points. A human operator was on board each autonomous vehicle to verify safety and aid passengers.





Thank you so much for this service. I am a single working mother and my car broke down recently. Struggling financially right now, this service helps me still be able to afford getting to and from work while I'm out of a vehicle and I'm so grateful for that.

—goMARTI rider, Grand Rapids

GOMARTI PROJECT GOALS

- **Advance and inform the technology in rural and winter conditions**
- **Provide accessible mobility options**
- **Engage with the local community and build trust in self-driving shuttles**
- **Aid workforce and economic development**

"As a person who uses a wheelchair, goMARTI has significantly improved my independence by eliminating transportation barriers that would have kept me from attending activities."

—Myrna Peterson, Itasca Life Options and community engagement advocate

THE RESEARCH

Assessing Rural Stop Accessibility in Winter Weather

Choosing the right location for stops is essential for every transportation solution—and especially for one operating in winter weather and focused on accessibility like goMARTI.

To determine best practices for choosing stop locations, the Plum Catalyst team (in conjunction with the May Mobility site team and Grand Rapids Public Works) assessed stop locations in winter and summer weather, focusing on safety and accessibility for both riders and shuttles. One preliminary finding focused on the location of curb cuts. While mid-block curb cuts provide better stop locations, they are uncommon in rural communities. Locating stops near parking lot entrances or trail crossings offered a convenient solution.

Evaluating Community Transportation Needs and Efforts to Meet Them

A U of M Humphrey School research team conducted an overview and evaluation of the goMARTI pilot project. The team found a need for accessible transit in Grand Rapids—which the goMARTI project successfully helped meet. Overall, riders enjoyed their travel with goMARTI and expressed a desire for expanded service. The project report provides a summary of findings and recommendations.

Exploring the Potential of Mobility Hubs

Mobility hubs are an emerging trend in transportation focused on connecting multiple modes in a safe, comfortable, and accessible environment. In another project, a team with the U of M's Minnesota Design Center researched and designed a "mobility hub" concept as a multi-modal transportation and information center for people using goMARTI. This work adapted the hub concept, which has primarily been used in urban settings, to a rural city environment. The hubs' design ranged from simple to complex and focused on accessibility with accommodations for individuals with motor, visual, auditory, and cognitive impairments.

THE FINDINGS

10 Key Takeaways from the goMARTI Pilot Program

1. Expect That Onboard Operators Will Perform Multiple Roles

The automated vehicle operators (AVOs) were key to rider safety, comfort, and acceptance. AVOs played an important role in communicating with passengers, sharing their expertise, and securing wheelchair riders. Having an operator with access to pedals and a steering wheel also allowed for operation in bad weather or other scenarios at the edge of the operating domain.

2. Optimize Stop Locations

Identifying and creating optimal stop locations is an important but challenging step that needs to balance rider and traffic safety, accessibility in a variety of weather conditions, vehicle self-driving capabilities, and community demand.

3. Introduce New, Complementary Technologies

Autonomous vehicles are only one of the technologies the goMARTI program introduced; on-demand transportation and app-based services were also new concepts for many people in the community.

4. Have a Call Center

Having a local call center available 24/7 to answer questions, help with app installation, or book rides over the phone was essential for reaching target populations, many of whom were inexperienced using technology.

5. Involve, Adapt, and Evolve

Empowering the community to help shape operation hours and stop locations increased community buy-in; continuing to engage the community through a variety of methods (such as meetings, surveys, and outreach events) built on the initial engagement momentum. Frequent updates to the stops and routes allowed goMARTI to adapt and evolve in response to community feedback and recommendations, leading to increased ridership.

6. Play the Long Game

A local presence and strong, engaged community ambassadors in a rural community can amplify and accelerate adoption, but recognize that rural community buy-in can take a long time. Case in point: goMARTI ridership increased significantly almost a year into the pilot.

7. Choose the Best AV for the Job

Having an autonomous vehicle capable of traveling the speed limit and not disrupting other traffic flow is mandatory for community acceptance. Additionally, using several off-the-shelf vehicles (instead of a unique technology) allows for redundancies and helps ensure service reliability.

8. Fill a Need

Beyond the autonomous capabilities of goMARTI, a major driver of the program's success was its ability to fill an unmet need in the rural community for microtransit and mobility-on-demand services—particularly for riders with limited access to cars such as older adults, teens, and riders with disabilities.

9. Offer Year-Round Technology

Just like human drivers, the Autonomous Driving Kit can adjust driving behaviors for sunny summers and snowy winters. Taking advantage of this driving adaptability allowed for optimal performance year-round.

10. Recognize How Transportation Can Change Lives

Providing the opportunity for travel to social, educational, recreational, and medical events and appointments can change people's lives for the better.

THE NEXT STEPS

In June 2023, the USDOT announced that the Grand Rapids goMARTI pilot project will be extended and expanded with the help of a $9.3 million federal Advanced Transportation Technology and Innovation Program (ATTAIN) grant to the Department of Iron Range Resources & Rehabilitation. Goals for the expansion include providing increased access to essential services, improving accessibility, providing exposure to new technologies, and conducting autonomous vehicle research in a rural environment. More vehicles and stops will be added, research from the U of M Center for Transportation Studies will continue, and additional workforce development efforts will occur.

PROJECT TEAM & PARTNERS

The goMARTI pilot project was made possible by collaboration between multiple state and local stakeholders, partners, and resources, including cash and in-kind contributions from the project team.

AGENCY & COMMUNITY PARTNERS

City of Grand Rapids

Minnesota Department of Transportation

Minnesota Iron Range Resources & Rehabilitation

Itasca County

Arrowhead Transit

NONPROFIT PARTNERS

Blandin Foundation

Mobility Mania

First Call 211

PRIVATE-SECTOR PARTNERS

May Mobility

The Plum Catalyst

Via

ACADEMIC & RESEARCH PARTNERS

University of Minnesota

Minnesota North College

NEXT Career Pathways

"The goMARTI project has been an excellent learning experience for the Minnesota Department of Transportation and our many project partners. Being the first large-scale deployment of autonomous vehicles in a rural environment that experiences harsh winter weather, the lessons learned from goMARTI will be extremely valuable for any future deployments of autonomous vehicles or micro-transit."

—Thomas Johnson-Kaiser, CAV-X Engagement and Project Manager, MnDOT

"Like much of rural America, our population in Grand Rapids consists of a large portion of people 65 years and older. A big challenge with an aging population is transportation. Having the ability for a vehicle to bring you to a grocery store or department store and then bring you home at no cost—it's immensely valuable for those residents."

—Tom Pagel, City Administrator, City of Grand Rapids

cts.umn.edu/research

FOR MORE INFORMATION

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