



TPEC Advisory Board Update:

November 2023

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TPEC | TRANSPORTATION POLICY AND
ECONOMIC COMPETITIVENESS

Thank you for your continued support of the TPEC program. Please read about the exciting progress in our research and our plans for coming months.

WELCOME

Thank you for your commitment to the TPEC Program! We welcome comments and feedback on current research initiatives and projects as well as future research directions at any time. We look forward to meeting with all of you at our next meeting, planned for early January. Please look for an invitation soon.

FEATURED STORY

Adeel Lari leaves legacy of transportation research—and hope for the future



Adeel Lari retired this past summer from his research position at the [Institute for Urban and Regional Infrastructure Finance \(IURIF\)](#) at the [Humphrey School of Public Affairs](#). He was an essential member of the TPEC research team.

“Adeel’s nearly 50 years of experience in transportation work, first with the Minnesota Department of Transportation and then at the Humphrey School, will never be replaced, but the products of this work will continue to benefit us many years into the future,” says [Frank Douma](#), IURIF director of state & local policy and outreach.

Lari conducted pioneering work in right-of-way contracting, transportation finance, telework, and implementation of numerous technological innovations, all of which provide benefits to the traveling public and material for further research within Minnesota as well as nationally and internationally.

A highlight of this work was leading Connecting Minnesota, a public-private initiative in the 1990s to build a statewide fiber optics network. When a private partner was unable to finish the project, the state gained hundreds of miles of built conduits and fiber as liquidated damages, worth more than \$50 million, at no cost to the state.

Another point of pride is his work in “value capture,” an approach that collects a share of the increased value stemming from transportation investments. His research, including a study funded by the [state legislature](#), is still cited and used nationally and internationally (such as his work in Singapore). His efforts also led to several partnerships with entities such as the [National](#)

[Governors Association](#) and the World Bank; the latter requested him to consult with the Indian government.

Another major effort was [eWorkPlace](#), a state-sponsored, multi-year initiative that helped Twin Cities-area businesses foster teleworking. The initiative received \$3.5 million—the largest such investment in the country for telecommuting—to decrease congestion and environmental degradation caused by transportation. “I was able to partner with nearly 100 businesses to prepare them—even before COVID-19—for a telecommuting future, which gave them an advantage during the pandemic,” Lari says.

Lari is also enormously proud of his work championing diversity in the state. His recent telecommuting research, for example, looked at disparities by race, gender, and income.

Looking ahead, Lari sees hope for self-driving vehicles to help disadvantaged communities. “Self-driving vehicles, along with AI to analyze data, could help us solve transportation challenges and decrease car dependence,” he says.

He is excited about the increased funding from the 2023 Minnesota transportation bill, which he believes will provide reliable funding for transit. “I hope it is used wisely and not just for the suburban upwardly mobile,” Lari says. “I want to see it invested to provide mobility for the people who need it the most—that’s the challenge we have.”

If you need any further information or have any research-related questions, please contact Douma or [Camila Fonseca-Sarmiento](#), IURIF director of fiscal research.

RESEARCH UPDATES

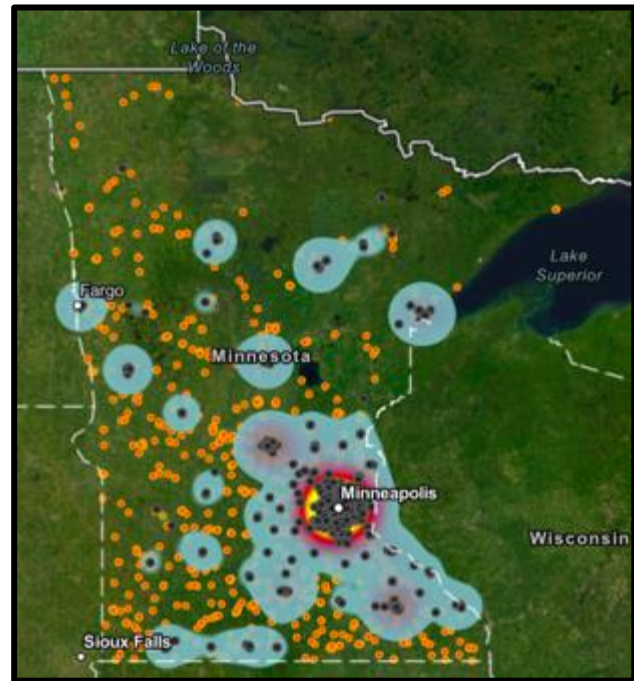
Case study demonstrates benefits of medical device industry cluster

TPEC researchers are in the final stage of completing a new Greater Minnesota Medical Device Industry Clusters report, which will expand on past research into the medical device industry cluster within the state. The story map developed in tandem with this research provides new perspectives on one of Minnesota's most dynamic industries and reveals the extent of the cluster's reach beyond the Twin Cities metro area into Greater Minnesota.

In this study, researchers mapped the full extent of the medical device cluster and used spatial quantitative analysis to better understand its statewide impacts. This research demonstrated that while there is a concentration of companies involved in this industry within the Twin Cities metro area, many firms included in this cluster are highly dispersed throughout the state. Supply chain mapping of companies and key locations demonstrates the importance of regional transportation networks to facilitate imports, exports, and inter-cluster exchange of goods.

A case study of [Granite Partners](#), which strategically utilizes relationships within the medical device cluster for competitive advantage, demonstrated the cluster's benefits, including access to specialized skills and suppliers. Granite Partners also exemplifies a changing corporate role through "shared value" initiatives that aim to benefit communities.

The findings of this report offer valuable insights for policymakers on how this robust industry drives economic development and competitiveness across Minnesota, and how transportation infrastructure is crucial in supporting this cluster's continued growth. The TPEC team is also planning an event to bring key stakeholders together to present and discuss the findings of this report.



Upcoming Studies: Midwest Industry Cluster

For the next phase of this research, the TPEC Industry Clusters and Freight team will evaluate how the concept of circularity may be applied to industry clusters within the region. Broadly, the concept of circularity emphasizes the reduction of material use, the recapture and repurposing of waste, and the redesign of elements within the value chain to increase overall efficiency. Embracing circularity not only helps reduce reliance on raw materials but also encourages the reuse of existing resources, extends the life of products, and ultimately generates new opportunities for innovation and growth.

This research is intended to empower, support, and inform companies and policymakers navigating the transition from the conventional "Make-Take-Dispose" model to one rooted in circularity. Our goal is to uncover how the adoption of circular economy principles within industry clusters can boost competitiveness and simultaneously reduce their environmental footprint. As we delve into this intersection, we will examine the role of governance in this transition and explore opportunities and challenges that the integration of these principles will present to regional transportation systems.

Automated vehicle projects provide insight about public perception

TPEC researchers are continuing to discover exciting applications from two connected and automated vehicle (CAV) pilot projects.

Final data synthesis is underway for our work pertaining to a nearly year-long project named [Bear Tracks](#), located in White Bear Lake, MN. Bear Tracks featured an electric automated shuttle that ran along a 1.5-mile loop and serviced primarily elderly, low-income community members who experienced transportation challenges.

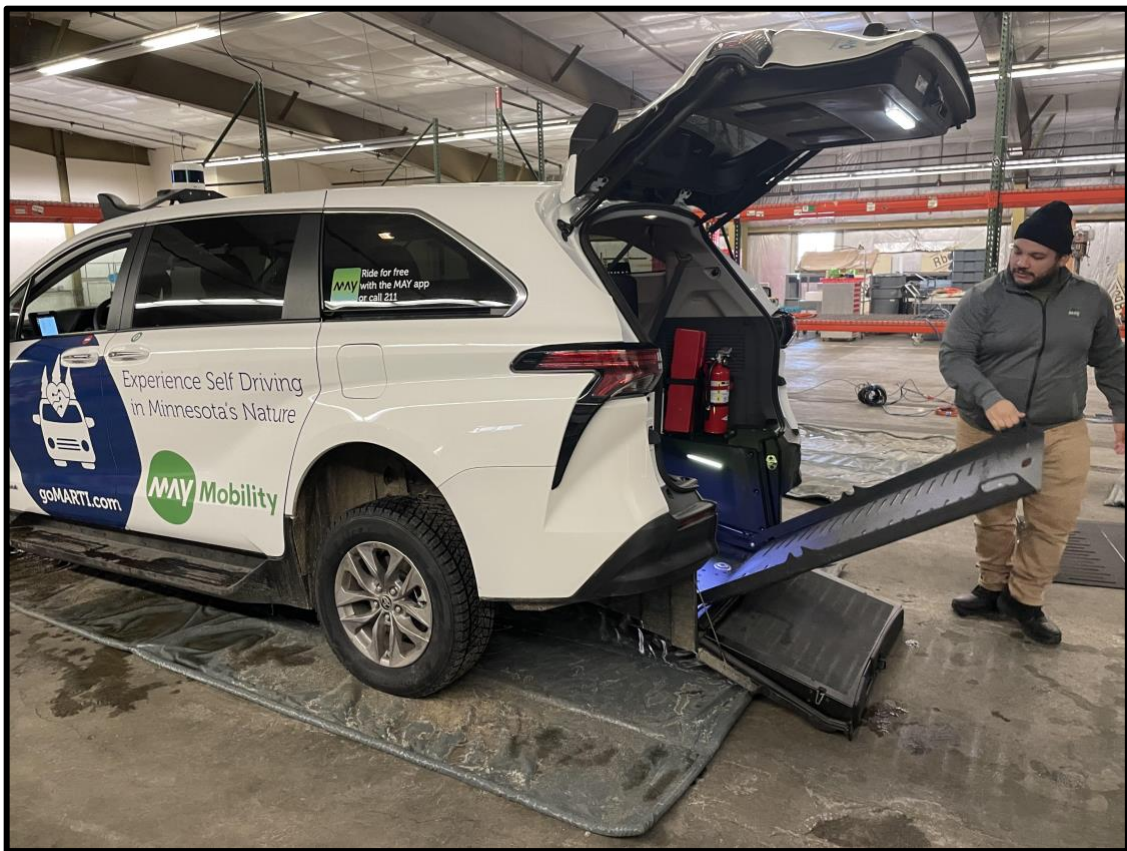
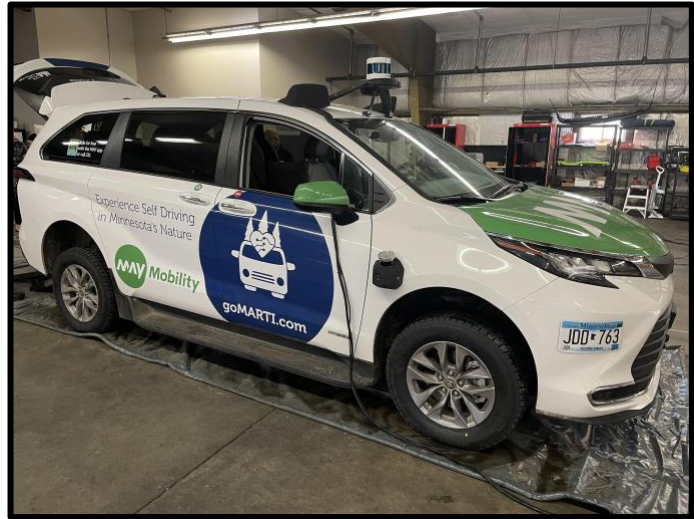
Researchers collected and analyzed survey data, which revealed an interest in CAV technology and an increase in positive attitude responses after riding the shuttle. In addition to overall enthusiasm, concerns were recorded from the surrounding neighbors who felt the low-speed shuttle created traffic frustrations despite the availability of an alternate route. Furthermore, a demonstration at the local high school generated active engagement from students who expressed possible travel implications and job opportunities in their future.

Although this project has concluded, researchers continue glean insights into the challenges and successes faced in its duration and are excited for future endeavors.



[GoMARTI](#), the pilot project in Grand Rapids, is seeing significant traction. Fleet and route expansion is underway after officials successfully applied for federal funds and were awarded a \$9.3 million [ATTAIN federal grant](#). This is the first CAV project in Minnesota offering an on-demand service, with more than 70 pick-up and drop-off sites. Ridership has continued to grow monthly, and the service has completed more than 3,500 cumulative trips. It is anticipated this number will continue to rise with the addition of fleet vehicles.

TPEC researchers were not surprised by this success, as their research in previous studies examined how the goMARTI project could meet transportation needs in the area. Like Bear Tracks, goMARTI is available to the general public; key constituencies are people with disabilities and those who experience transportation challenges. Rider surveys also show great interest in the project, and positive-attitude responses are growing as the community becomes familiar with the service. Continuing ahead, we are looking forward to being a part of the work supported by the ATTAIN grant.

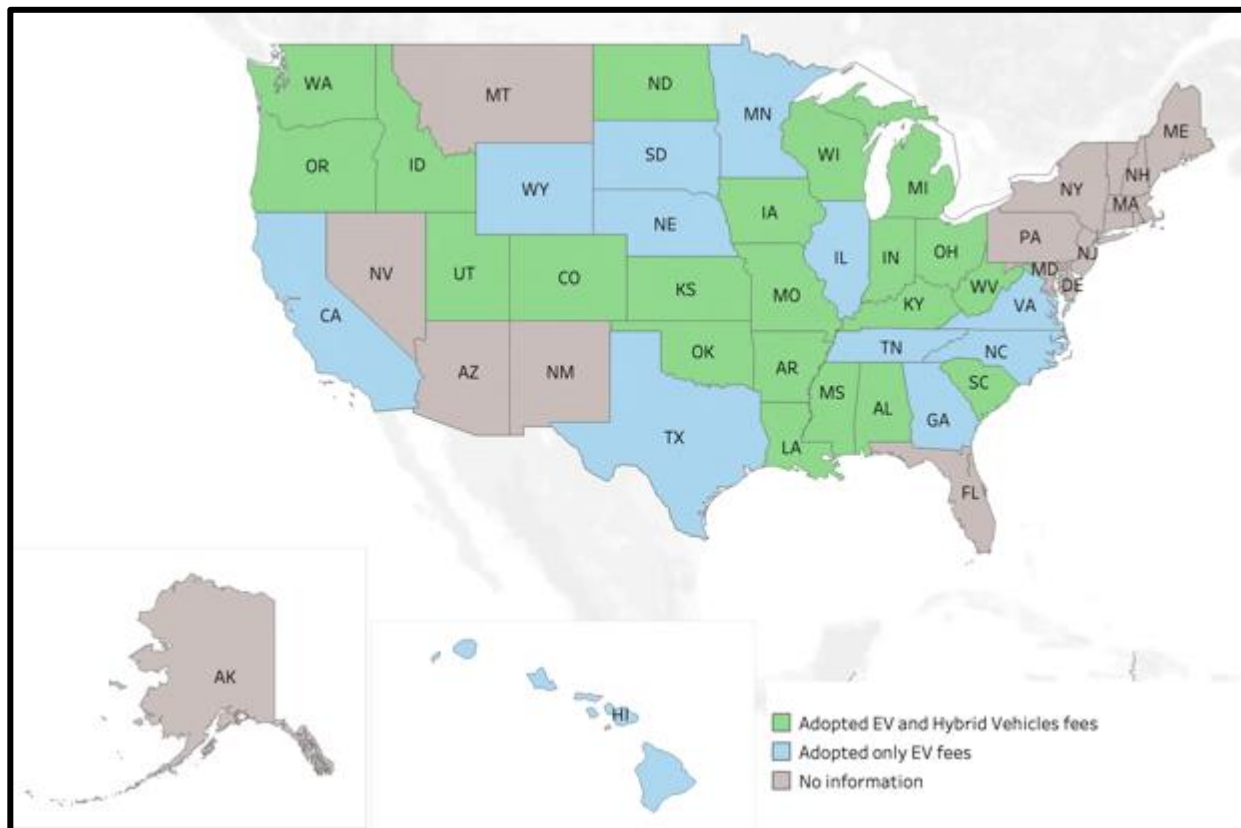


Finance

Researchers are completing a new research note about alternative revenue mechanisms for the roadway and bridge infrastructure. The increased adoption of alternative fuel vehicles, combined with the increased vehicle fuel efficiency, pose challenges to the revenue-generation ability of the motor fuel tax.

In response to this issue, several states have explored alternative revenue mechanisms to bridge the funding gap. One mechanism has been the introduction of special registration fees for specific hybrid and EV models. These fees are levied in addition to standard motor vehicle registration fees, with the aim of ensuring that all vehicle owners, regardless of their choice of propulsion, contribute equitably to the maintenance and expansion of the roadway system. Across the U.S., 33 states have adopted a special registration fee for electric and hybrid vehicles (see map).

Another mechanism is the charge per mile, also known as a mileage-based user fee (MBUF), distance-based user fee (DBUF), and roadway user charge (RUC). Some states are exploring or considering RUCs, which link taxation to the actual use of the roadway by a driver. As of 2023, three states have enacted legislation and currently collect revenues from per-mile charges.



EDUCATION

Welcome to our new graduate students!

TPEC researchers guide and mentor graduate students, who in turn provide essential work for the program. This academic year we are pleased to announce three new students.



Amrutha Shetty Jayaram Shetty, a master's candidate in data science in the University's College of Science and Engineering, is passionate about using data to make a positive impact on the world. Shetty has expertise in uncovering insights from data and crafting data narratives to inform decisions and optimize business strategies. She has a proven ability to apply machine learning, statistical programming, and data visualization tools to solve complex problems. She is also experienced in collaborating with cross-functional teams to drive data-driven decision-making and deliver impactful results.

Shetty's tenure at Wunderlich Malec Engineering solidified her ability to seamlessly integrate data science methodologies into practical applications. Time spent at Emplay Analytics involved developing web chatbots for industry-leading companies, contributing to a robust foundation in the data science life cycle.

Shetty is currently immersed in the TPEC analysis of surcharges for battery electric vehicles and plug-in hybrid electric vehicles across various US states. This work provides valuable hands-on experience with real-world datasets that align closely with her interests, and the focus on data visualization adds even more impact to her work.



Audrey Clark is a first-year graduate student in the Master of Urban and Regional Planning program in the Humphrey School. Previously, she worked as a project planner in the title insurance industry while pursuing an undergraduate degree in urban studies at the U.

During that time, Clark became increasingly interested in connected and automated vehicle (CAV) technology. She has since developed a desire to bridge the gap between technology and the community, particularly related to equity and perception challenges. She took some time off post-graduation in 2020 to stay

home with her two young kids and is excited to be back working toward deepening her understanding of transportation planning and practices.

Being a research assistant at TPEC allows Clark to gain valuable insights into current cutting-edge technologies and get hands-on experience with CAV projects. She looks forward to establishing a professional network of valuable career connections. Postgraduate, Clark hopes to enter the field of CAV or intelligent transportation systems planning.



Jem Thompson is also a student in the Master of Urban and Regional Planning Program. His studies are focused primarily on the intersection of sustainable transportation systems, land-use decisions, and design.

Thompson's past work centered on active transportation and micro-mobility planning, as well as transportation demand management. His former position as project coordinator and researcher for a San Francisco-based transportation consulting firm helped him to realize the importance of land-use and urban design in determining the viability of sustainable transportation modes. It was this realization, and the desire to improve the sustainability of current and future transportation systems, that inspired Thompson to move to Minneapolis and pursue a graduate degree in urban planning.

As a TPEC team member, Thompson will primarily be assisting with industry cluster and freight research under the supervision of Thomas Horan. His focus will be the application of principles of circularity to industry clusters and their supply chains. This work aligns with Thompson's professional and academic interest in improving the sustainability of transportation systems in the Midwest and beyond.

ENGAGEMENT

Smart Rural Seminars

Frank Douma was a presenter at the Smart Rural Seminars held in Grand Rapids, MN, on September 21 and October 26. He presented results from research he has been involved in on how connected and automated vehicles could address mobility and access needs of transportation-disadvantaged groups.

Other Activities

- Douma summarized laws and regulations related to transportation planning to the [Metropolitan Governance Task Force](#) on October 11. He was invited by Minnesota Rep. Frank Hornstein, chair of the task force and a TPEC Advisory Board member. The task force was created as part of the 2023 transportation bill to review the function and

future of the Metropolitan Council. Rep Jon Koznik, another TPEC Advisory Board member, is also on the task force.

- Tom Horan and Mattie Anders, a former Humphrey School graduate student, presented their industry cluster work to the [Region Nine Development Commission](#) this past summer. TPEC research supports the commission's efforts to better understand the region's medical device industry.
- Horan and Burke Murphy (University of Redlands School of Business & Society) co-presented their work at the [Building Sustainable Competitiveness Through Transformative Research](#) conference at the University of Deusto in San Sebastian, Spain, in June 2023. Their paper: *Spatial Dimensions of Territorial Competitiveness: Using GIS to Discover Multi-dimensional Cluster Impacts*.



Burke Murphy and Tom Horan