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TPEC Advisory Board Update

April 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 from Advisory Board members 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, which we hope to schedule for June 2023. We will be sure to stay in touch in the coming weeks as we organize this event.

FEATURED RESEARCH

Impacts of COVID-19 Telecommuting for the Twin Cities Metro Area



Telecommuting became much more common during the COVID-19 pandemic, and the initial impacts—such as reduced traffic congestion and cleaner air—were largely positive. The benefits and costs, however, did not fall equally across all parts of the population, as some "essential" workers, who usually had lower incomes and were from BIPOC (Black, indigenous, and people of color) populations, did not have the option to work from home.

TPEC researchers led by Adeel Lari examined the impacts of telecommuting on travel and land-use patterns, congestion, and transit use, giving an in-depth look at related equity issues. For their analysis, they interviewed Twin Cities metro stakeholders and used MnDOT and Metro Transit data from key locations and commuter corridors across the region.

“Broadly, we found that travel behavior changes have the potential to impact investments in infrastructure across the Twin Cities metro region,” says Lari, director of the Institute for Urban and Regional Infrastructure Finance (IURIF) at the Humphrey School of Public Affairs. Some research highlights:

- **Travel dispersion.** Overall, the newfound flexibility offered by telecommuting was reflected in a dispersion of travel patterns. More employees worked from home in the mornings, reducing morning peak travel. This drop-off in turn affected traffic in the middle of the standard workday. Evening traffic volumes downtown returned to pre-pandemic levels by 2022, but a greater number of these trips were discretionary (not for commuting) than before.
- **Downtown congestion.** In 2020, peak downtown travel volume fell by nearly 80 percent; in 2022, even after travel restrictions relaxed and offices reopened to

workers, morning peak traffic volumes remained 5 percent below pre-pandemic levels. “While a 5 percent reduction in traffic volume may seem insignificant, it has remarkable impacts on congestion,” Lari says.

- **Jobs.** The job impacts on downtowns were significant, especially for small businesses in downtown skyways, such as food and hospitality services. Many of these small businesses were BIPOC-owned or employed significant numbers of BIPOC employees.
- **Transit ridership.** Ridership plummeted during the pandemic, but declines were unequal among sociodemographic groups. The remaining riders—many of them essential workers—were those who rely on public transit for mobility and accessibility throughout the day. Also of note: Essential workers may work different shifts than typical pre-pandemic commuters, causing a potential mismatch between needs and transit services.
- **Commuter transit.** Typical commuter transit—especially express bus services offered by Metro Transit and providers such as Southwest Transit—fared worse than regular fixed routes. In early 2020, express ridership nearly disappeared, with ridership dropping 90 to 95 percent. In the second quarter of 2022, the Southwest Transit Minneapolis and St. Paul express routes were servicing commuters at about 20 percent of pre-pandemic ridership levels.
- **Equity.** The pandemic exposed and exacerbated inequalities in nearly every facet of society. Jobs in retail, construction, hotels, and food services cannot be performed online, rendering teleworking unavailable to these workers, who often earn the lowest incomes. Further disparities by gender, race, and educational attainment were also present.

Policymakers and transit agencies have challenges ahead. The percentage of Minnesotans telecommuting remains much higher than in 2019 (23 percent as of January 2022), more than three times the pre-pandemic level. Shifts in peak travel volumes and the dispersion of travel patterns make travel behaviors less predictable. And notably, as much as telecommuting became a reality for many, it remains out of reach for others.

Since a major portion of the remaining transit trips serve basic subsistence trip purposes for riders, transit services must remain. “However,” Lari says, “transit managers and urban planners need to explore new efficiencies and investment strategies to best serve post-pandemic travel patterns.”

Strategies are also needed to overcome the disparate impacts of telecommuting. “Policymakers need to be intentional in the development and implementation of policies and practices that ensure viable and equitable outcomes from telework,” Lari says.

The researchers’ paper—The Impacts of COVID-19 Telecommuting for the Twin Cities Metro Area—was presented in a TRB webinar on “Telecommuting and Transit Ridership in a Post-Pandemic Future” in March. Key members of the research team have been Lari, graduate research assistant Maya Sheikh, and Frank Douma. Graduate research assistants Mattie Anders and Kribashini Moorthy also contributed.

Electric Vehicle Fees: What Factors Prompt States to Adopt Them?



Higher fuel efficiency and the rise of electric vehicles (EVs) have an unintended side effect: They reduce the fuel-tax revenues state and local governments need to fund transportation infrastructure. To help fill the growing revenue gap and ensure that all vehicle users pay for road maintenance, many states have adopted a surcharge levied on EVs and hybrids. But why do some states adopt surcharges while others do not? A project by TPEC researchers explored key factors that come into play.

The EV fee is typically an annual flat fee collected in addition to the registration tax and applies to all fully electric vehicles, says TPEC researcher Camila Fonseca-Sarmiento, director of fiscal research with IURIF. Some states have adopted a lower fee for hybrid vehicles.

For their research, the team created a dataset of factors—such as transportation revenue capacity, transportation needs, environmental concerns, and political environment—from states that adopted an EV fee between 2012 and 2020. Through modeling and analysis, they then identified which factors may influence EV fee adoption.

These factors made it *more* likely that states would adopt EV fees:

- Higher reliance on the fuel tax
- Improved fuel efficiency
- More roadways in poor conditions
- Higher EV sales
- More nearby states with EV fees

“States that depend heavily on the fuel tax, and ones where drivers get better mileage, have bigger revenue holes to plug,” she explains. “And states with a higher percentage of roadways in poor conditions have bigger needs to fill.”

Rapid growth in EV sales can hike system costs, particularly to build out the charging infrastructure. And laden with big batteries, some EV models are heavier than their gas-powered versions, accelerating pavement damage. “So, states with more EVs turn to EV fees to cover costs,” she says. A higher share of neighboring states with EV fees also correlated with higher odds of a state adopting EV fees.

These factors made it *less* likely that states would adopt EV fees:

- Higher growth in vehicle-miles traveled (VMT)
- Higher share of Democrats in the state’s House of Representatives
- Higher emissions and worse air pollution

“We didn’t expect the higher VMT finding,” Fonseca-Sarmiento notes. “It could be that states with higher VMT may be considering other revenue mechanisms, such as a per-mile fee, instead of EV fees.”

States with Democrats in control of the state’s legislative house were less likely to adopt EV fees. “This may be because Democrats are more likely than Republicans to support environmental policies, such as EV subsidies, and so they may be reluctant to counter that goal with surcharges.”

Similarly, states with worse air pollution are less likely to adopt EV fees. These states are more likely to promote EVs as an efficient way to address environmental conditions, she says, and therefore may be less likely to adopt EV fees.

The researchers’ paper—Explaining the Adoption of Electric Vehicle Fees across the United States—was presented in a poster session at the 2023 Transportation Research Board in Washington, D.C. The research was also presented at the Association for Budgeting and Financial Management (ABFM) conference in Miami in September 2022. Others on the research team were Raihana Zeerak, IURIF researcher; Zhirong "Jerry" Zhao, IURIF founder and academic advisor; and Humphrey School doctoral student Haiyue Jiang.

Automated Vehicle Pilot Projects Underway



TPEC researchers are participating in two MnDOT pilot projects of connected and automated vehicle (CAV) projects.

Bear Tracks—a highly automated, 11-passenger, low-speed, fully electric shuttle—began service in August in White Bear Lake. The objectives of the pilot project are to familiarize the public with AV technology, gather lessons learned for AV operators in all

weather conditions, and provide innovative and enhanced mobility for persons with disabilities and seniors. On a 1.5-mile route, the shuttle serves two senior housing developments, one of which is low income; PAI, an adult day care service; and the White Bear Lake YMCA.

A pilot in Grand Rapids called goMARTI began operations in October. It has multiple self-driving vehicles offering free on-demand rides on an extensive route that includes

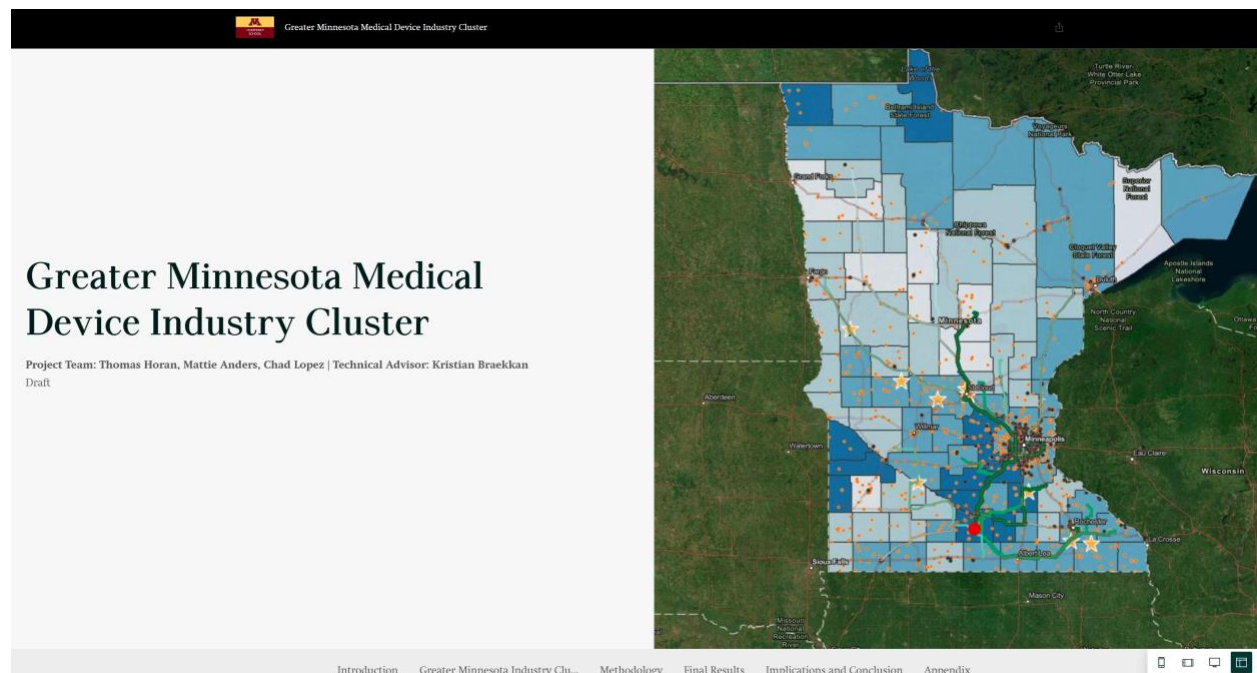
nearly 70 pick-up and drop-off locations. Goals of the goMARTI pilot are to advance AV technology in rural, winter conditions; engage, educate, and build trust with communities; expand safe, accessible transportation; and understand the economic development impacts to the Iron Range.

TPEC researchers are supporting public evaluation efforts of the White Bear Lake project and examining transportation challenges and stakeholder collaboration in Grand Rapids.

Medical Device Industry Cluster: Mapping and Case Study Show Statewide Impact

This study concentrates on the Greater Minnesota medical device industry cluster through both a quantitative and qualitative approach. The study first maps the highly diverse medical device companies and their product movement throughout the state. This shows that the generation of medical device-related products does not only originate in the Twin Cities, but throughout greater Minnesota as well, and also maps their movement within Minnesota.

Following this, a case study was conducted on a private investment firm in St. Cloud, Minnesota, which utilizes the industry cluster approach as part of its business model. Through multiple interviews with executive leadership at the company, the case study explores the advantages of operating within this industry cluster. It analyzes how this approach has guided the company to contribute to both hard and soft infrastructure by growing talent and condensing supply chains, and how implementing a "shared value" strategy has worked to improve community wellbeing and drive sustainable practices company-wide.



ENGAGEMENT

TPEC Researchers Contribute Papers about the Future of Mobility



What's next in transportation? The [Future of Mobility](#) paper series from the Center for Transportation Studies offers insight. Top U of M researchers and other national experts scan the horizon, reflect on critical transportation topics, and recommend action steps for public officials and policymakers. A broad communications campaign is sharing their ideas throughout 2023.

TPEC researchers contributed two papers for the series.

Camila Fonseca-Sarmiento looked at transportation funding in [New Revenues are Needed to Fill the Transportation Funding Gap](#). Much of Minnesota's roadway infrastructure was originally constructed 60 to 70 years ago and is now in need of significant maintenance or reconstruction. Because the current transportation funding system cannot keep up with the system's needs, Fonseca-Sarmiento believes new revenue-generating mechanisms—as well as supplemental funding from the general fund—will be needed to raise adequate revenues for infrastructure needs. Examples of new mechanisms include surcharges levied on electric and hybrid vehicles, wheelage taxes, local option transportation sales taxes, and per-mile surcharges.

Fonseca-Sarmiento presented her work at a Future of Mobility event for state legislators. Frank Douma also participated in the event, which was hosted by CTS in February.

Adeel Lari and Frank Douma assessed the pandemic's impacts on transit ridership, social equity, and urban form in [Telecommuting: The Pandemic's 'Silver Lining' May Have a 'Touch of Gray.'](#) A sudden and massive move toward working from home created a situation where transit ridership plunged, downtowns emptied, and low-income workers were left with less-frequent service. The researchers say policy innovations are needed that will guarantee our "new normal" is more beneficial, for more people. For example, regular-route transit services used by low-income essential workers need to be supported while investments are made in more innovative shared and micro-mobility services that can operate more efficiently in less densely populated areas. Broadband should also be recognized as essential infrastructure: Letting the market serve only those who can afford reliable high-speed telecommunications services will only exacerbate existing social disparities.

Other Activities

- Frank Douma was a panelist at the Law and Mobility Conference held in Ann Arbor in March. The event was sponsored by the Law and Mobility Program at Michigan Law. In his remarks, Douma referenced a TPEC paper published in Michigan Law's *Journal of Law and Mobility* titled "Opportunities and Challenges for Deploying Connected and Automated Vehicles to Address Transportation Disparities in Urban Areas." The paper was written by former TPEC graduate research assistants Erika Shepard and Kimberly Napoline, under the guidance of Douma and Adeel Lari.
- Douma joined CTS Associate Director Gina Baas to discuss connected and automated vehicles with KYMN Radio's Public Policy This Week on March 24.



- Camila Fonseca-Sarmiento gave a presentation titled "Distance-Based Fees: Financial Analysis and Rate Setting" to the Mileage-Based User Fees (MBUF) Subcommittee at the 2023 Transportation Research Board annual meeting in Washington, D.C. This work was also featured on the MBUF Alliance Radio on April 12, 2023. Fonseca-Sarmiento joined Adrian Moore to have an in-depth discussion of rate setting for the distance-based demonstration.