



Flexible Transit

GLOBAL IMPACT ARTICLE SERIES

Getting around without a car isn't easy in many U.S. cities. People who rely on public transit often contend with many challenges, including decaying infrastructure; not having easy access to a transit stop; lack of system reliability; restrictions to how late or early a system operates, and often, a lack of support to fund transit improvements. These difficulties can impact people in many ways, including their [ability to access essential healthcare, jobs](#) and grocery stores. Ride-hailing companies like Uber and Lyft can pick up the slack from inadequate public transit, but they also present challenges such as: being inaccessible to [people with disabilities](#); lacking the incentive to work along [unpopular routes](#); creating more emissions per mile traveled; and siphoning riders (and money) from public transit. One solution to these challenges is for transit agencies to enter into [public-private partnerships](#) with ride-hailing companies to expand public transit coverage.

The Ann Arbor Area Transportation Authority (AAATA) partnered with a University of Michigan Dow Sustainability Fellows team to explore the potential for a public-private partnership that could supplement and enhance the current public transit system in Ann Arbor, Michigan. The team researched the economic, social, and environmental costs and benefits of different ride-hailing public-private partnership models to determine which model could best be used to cover under-used bus routes and connect riders to transit stops.

RIGHT-SIZING THE SYSTEM

The Flexibus project is a case study that addresses the issue of inefficiency in a bus system. Key to their core message is the idea that they are not trying to replace public transit. "We want to enhance public transit," says Jim Gawron, a member of the Dow team who is pursuing master's degrees at the Ross School of Business and the School for Environment and Sustainability. "Access to mobility is a fundamental human right, and a gateway to so many other things," Gawron says, "like medical care, jobs, and food access." The goal of the project is to show how to effectively use public transit funds to address triple-bottom-line (TBL) sustainability, like funneling funds from under-used routes to heavily trafficked ones. This "right-sizes" the system, matching supply to demand.

"Public dollars are incredibly precious," says Jack Kramer, another team member and a master's student at the Ford School of Public Policy. "There's constant political pressure to reduce the amount we spend on public transit and empty buses driving around can justify transit funding cuts." This can help reduce the frustration of taxpayers who don't like to see their money going toward running unused buses. "This strengthens the appeal of public transit," he says, and addresses a significant weakness of the system by reducing the perception and reality of inefficiency.

SUSTAINABILITY BY THE NUMBERS

The team used the TBL framework throughout their project, thinking about social, economic, and environmental sustainability. "Transportation is a huge cost to the country," says Kramer, who's primarily interested in the social and economic dimensions of sustainability. Getting around is also an enormous cost to individuals, he points out, especially when people don't have appropriate access to transit and are forced to use a car, as is the case in many US cities. Finding a balance that supports public transportation and fully accessible mobility options is a serious socioeconomic sustainability challenge.



In Ann Arbor, along AAATA's Route 67, a bus typically ferries fewer than five people per hour at the cost of about \$94 per service hour, resulting in a high per-capita transportation cost. Comparatively, the average Ann Arbor ride-hailing service costs about \$7 per person; even with a subsidy from the city of \$5 (as suggested by the Flexbus team) it would take 19 ride hails to break even with the cost of the bus. "With fewer than 19 rides [along a route] you can make a financial claim that [a transit agency] can save money," says Kramer, with an average of \$80 saved per hour.

Not only does under-used transit cost a lot, but "buses running around empty use a lot of unneeded fuel," Gawron says. He has researched life-cycle assessments and created one for the team comparing buses versus ride-share services. The potential TBL benefits include:

- **Social:** Shortens wait times overall; reduces the wait time in areas not sheltered from the weather through the door-to-door pickup; and helps transit agencies and riders keep up with new technology
- **Economics:** Up to 85% hourly savings—takes 19 Flexbus rides at \$5/ride to break even with the conventional bus at \$94/service hour
- **Environment:** Reduces greenhouse gas (nitrogen oxide and sulfur oxide) emissions by up to 95%

FRAMING IS EVERYTHING

One of the key challenges the project team faced was how to communicate their project goals and results properly. "The importance of framing is double underlined in this project," says Kramer. "People are very passionate about public transit and very protective of it. We needed to be careful to frame this as something that helps public transit because it is easy to be misconstrued [as trying to undermine it]."

"This is not a public transit killer, not a replacement, it's an enhancement," adds Gawron. The team's goal was to communicate that their recommended system funnels funds to other aspects of public transit, shifting dollars from underused and inefficient routes to places where the transit system can be enhanced, like improving service on heavily used routes.

The team supplemented their technical products with a [public relations video](#) to facilitate their framing of the issue. This was a last-minute idea to act as an "exclamation point" to the project, says Kramer. "[Our project outcomes] are challenging concepts to explain to people verbally," he says. The team hopes the brief and engaging video can be used by transit agencies around the country who might be considering similar projects to enhance their transit system's efficiency.

BROADER IMPLICATIONS

Although the AAATA is not currently in a position to implement the Flexbus system, the team is confident their analysis framework applies to transit agencies around the country. Apart from their analysis and research into a multitude of public-private ride-share-transit options, the team also created a calculator that transit agencies can use to figure out how much fuel and money they might save by switching a route to an on-demand ride-hailing service.

The team's research is also applicable when thinking about broader global sustainability goals. Gawron was able to attend UNLEASH Innovation Lab 2017 in Denmark while working on the Flexbus project. According to its website, UNLEASH is a "global innovation lab that brings together people from all over the world to transform 1,000 personal insights into hundreds of ideas, and builds lasting global networks around the Sustainable Development Goals (SDG)." Gawron focused on SDG 11, Sustainable Cities and Communities, the goal the Flexbus project addresses best in his opinion.

"I worked with an urban mobility group and got to talk to 60 other sustainability professionals about the Flexbus project," he says. His experiences there helped to inform the project, and discussions about it helped the group brainstorm about transit-focused work from around the world. "The SDGs are critical at any level," says Gawron. "[They're] a great framework to communicate results so that everyone is using the same language."

PROJECT TEAM

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SUSTAINABLE DEVELOPMENT GOALS



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