NSF Awards #1854684 (Leap-Hi) and #2133342 (Civic) – On-Demand Multi-Modal Transit Systems
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Project Challenge
• **What?** Improve **accessibility** to jobs, groceries, health care, and education for all population segments.
• **How?** Revitalizing transit through the concept of on-demand multimodal transit systems (ODTMS), i.e., a transit system that fully integrates rail and bus routes on congested corridors with dynamic on-demand shuttles to serve the first and last miles.
• **Community driven:** same price as transit, flexible payment options, and support for meeting accessibility needs.

Science and Technology
• **Planning:** Bi-level optimization algorithms to design ODMTS networks that balances convenience, cost, and equity, and are computationally efficient. Fleet-sizing algorithms to determine the optimal number of shuttles.
• **Operations:** real-time ride-sharing dispatching and routing algorithms that guarantee service and minimize average waiting times.
• **Mobility platform:** mobile applications and cloud computing platform for supporting real-time operations.

The Pilot (launched March 1st, 2022)
• Piloting an ODMTS in Atlanta, the 8th most congested US city, with MARTA, one of the largest transit agencies.
• Validate the ODMTS in underserved neighborhoods and job centers with limited access to transit.
• Metrics focused on accessibility, cost, and convenience.