

# On-demand mobility experiment coming to MIT

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MIT junior Wally Wibowo (left) and graduate student Justin Miller prepare an electric vehicle for the Aerospace Controls Lab mobility-on-demand research. Credit: William Litant

Starting this month, there's a new way for some of the MIT community

to make its way around the Institute: chauffeured golf cart. Three of the diminutive, four-passenger electrical vehicles will ply the byways of West Campus, summoned, Uber-like, via a smartphone app, then plucking up passengers and depositing them at locations of their choice within a select service area.

The mobility-on-demand service is part of a collaboration between the MIT Aeronautics and Astronautics Department's Aerospace Controls Lab (ACL) and Ford Motor Company to develop a means of predicting customer location and requests for demand transportation services, while demonstrating algorithms and methods for navigating densely crowded pedestrian areas.

"Through the mobility-on-demand system we're developing, we can investigate new planning and prediction algorithms in a complex, but controlled, environment, while simultaneously providing a testbed framework for researchers and a service to the MIT community," says ACL director Jonathan How, who is also the Richard Cockburn Maclaurin Professor in Aeronautics and Astronautics. ACL researches topics related to autonomous systems and control design for aircraft, spacecraft, and ground vehicles. Theoretical and experimental research is pursued in such areas as estimation and navigation, planning and learning under uncertainty, and vehicle autonomy.

Since early this year the vehicles have plied campus byways, capturing pedestrian flow via onboard LIDAR and cameras, accumulating data to help the service anticipate where the most demand for the shuttles will be at any given moment.



Aerospace Controls Lab director Jonathan How with one of the vehicles his lab will use to develop protocols for mobility-on-demand shuttle services. Credit: William Litant

The LiDAR scans pinpoint the vehicles' locations and detect the movement of nearby pedestrians, allowing researchers to log the typical movements of people across the campus each day. Accurately predicting demand based on pedestrian flows will allow the shuttles to be carefully pre-positioned and routed to serve the MIT population in the most efficient way possible. "It's all about being in the right place at the right time," How says.

Researchers also take other factors into account that affect the

movement of pedestrians on MIT's campus, such as varying weather conditions, class schedules, and the dynamic habits of the MIT community across different semesters.

MIT community members who have volunteered for the test will use a [smartphone app](#) to indicate where they want to be picked up and dropped off. In return, they'll be given a pickup time estimate. If things go as anticipated, they won't be waiting long for a ride to arrive.



MIT junior Wally Wibowo (left) and graduate student Justin Miller with the three vehicles they have outfitted with LIDAR and cameras to capture user and traffic data while shuttling people around West Campus. Credit: William Litant

The vehicles are small enough to navigate sidewalks, while leaving plenty of room for pedestrian traffic. They're outfitted with

weatherproof enclosures to shield riders from inclement weather, which will be an especially rewarding feature when fall arrives.

How says that the local ride-hailing concept may someday provide a service that fills gaps between shuttle buses, automobiles, and public transportation, and may also have application to development of fully autonomous vehicles.

How says that the mobility-on-demand service will continue throughout the winter "unless Cambridge gets hit with blizzards like those we got a couple of years ago."

**More information:** Those interested in volunteering as passengers should email [mobility-passenger@mit.edu](mailto:mobility-passenger@mit.edu). People interested in being hired as a paid shuttle driver should email [mobility-driver@mit.edu](mailto:mobility-driver@mit.edu)

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