

Mcity Test Facility: An Outdoor Lab

The Mcity Test Facility is the world's first purpose-built outdoor laboratory designed expressly for testing the performance and safety of connected, automated, and driverless vehicles under controlled and realistic conditions. It is a full-scale, simulated urban-suburban environment that sits on a 32-acre site on the University of Michigan's North Campus, with more than 16 acres of roads and traffic infrastructure, including:

- Urban and suburban streets, including various lane configurations and sidewalks, pedestrian crossings, bike lanes, ADA ramps, street lights, parallel and diagonal parking, and a bus turnoff/stop.
- Instrumentation throughout, including a control network to collect data about traffic activity using wireless, fiber optics, Ethernet, and a highly accurate real-time kinematic positioning system.

Other features include:

Straight gravel roadway with a rural railroad crossing.

Traffic circle, a smaller version of a roundabout that is common in Europe and some older cities in the U.S.

Signalized intersections in different configurations, with mast arms, wood and metal poles, and pedestrian crossings.

Active railroad crossing

Trunk line road, a rural roadway with a fully equipped railroad crossing, guard rail, and temporary and permanent pavement markings.

Brick paver road simulated with stamped concrete.

Underpass, simulated by a tunnel that blocks vehicles from wireless and satellite signals.

Roundabout, an increasingly common approach to intersection design intended to improve safety.

Open test area that can be configured for a wide range of scenarios, including parking lots and novel intersection geometries.

4-way stop intersection, with straight as well as tight and sweepingly curved approaching roadways.

Overhead highway signs

Tree canopy, a simulated tree cover that reproduces the attenuation of signals that pass through trees.

Metal bridge deck, a bridge surface that poses special challenges for radar and image processing sensors.

Moveable building facades up to two stories high allow researchers to test the effects of various materials and geometries on sensor performance.

Meandering gravel roadway

Limited access freeway with access ramps, highway signage, guardrails, crash attenuators, and a concrete jersey-style barrier.

Ramp metering

Calibration mound to calibrate inertial measurement sensors on vehicles.

Open test area that can be configured for a wide range of scenarios, including parking lots and novel intersection geometries.

Variety of pedestrian crossings

