

Buffalo is serving as an incubator for the bus of the future

December 17 2013, by Charlotte Hsu And Steve Schnepf



The simulator bus, which UB researchers are using to study how design impacts activities like boarding, disembarking, paying fares and getting seated. Credit: UB IDeA Center

A temporary building on the University at Buffalo's South Campus houses a humble-looking contraption that could serve as a spark for improving public transit everywhere: a full-scale replica of a 40-foot public bus, complete with a fare box, seats and wheelchair ramp.

For five years, researchers at the UB Center for Inclusive Design and Environmental Access (IDeA Center) have been inviting volunteers with disabilities to take part in everyday activities like boarding, disembarking, paying fares and getting seated on the indoor vehicle.

The objective: To make suggestions about improving the design of buses by actually analyzing what works and what doesn't with current models.

While this may not sound like a radical concept, many features of transit fleets meant to accommodate people with special needs are put into production without being adequately tested, said Jordana Maisel, IDeA Center director of outreach and policy studies. The same goes for buildings and public spaces.

"Using a simulator allows us to see what the actual problems are," she said.

"By testing simulated designs prior to production, accessibility, safety and usability problems can be reduced in production models of vehicles and new buildings," said Edward Steinfeld, ArchD, director of the IDeA Center. "For example, we identified a problem in our lab with a new ramp system two years before it was later reported in the field."

The study, which is ongoing, has resulted in recommendations including:

- Creating a continuous handrail that goes from the front entrance of the [bus](#) to the fare box, which will help blind and visually impaired passengers locate the device.
- Using smart cards that you can simply tap against a card reader to improve boarding speed and convenience for all riders, especially those with poor motor control and those with visual impairments.
- Enabling mid-vehicle boarding for wheelchair users; this would enable faster boarding, as boarding in front requires navigating

wheelchairs through a difficult turn and narrower spaces between the front wheel wells.

The research team used motion sensors and video recordings to study areas where volunteers experienced difficulties.



A volunteer outfitted with motion sensors navigates a full-scale replica of a public bus. The University at Buffalo's Center for Inclusive Design and Environmental Access (IDeA Center) is studying how to improve the design of buses by analyzing what works and what doesn't with current models. Credit: UB IDeA Center

Findings were sent to the Niagara Frontier Transportation Authority (NFTA) in Western New York, whose latest 1300 Series buses already have two changes recommended by the study: placing a metal bumper on the floor beside the driver's seat to prevent mobility devices from

running into uneven edges and getting stuck, and adding another bumper by the front doors to direct mobility devices onto the bus ramp while disembarking.

The NFTA has four of these upgraded vehicles in service, said Jeffrey Sweet, an NFTA equipment engineer who manages bus procurement. He added that the hope is to incorporate additional IDeA Center suggestions as the authority procures more buses and updates its on-board fare collection system.

"The interior of a bus is rife with unintended consequences of design elements," he said. "This study helped to show areas where current designs could be improved to assist our riders with disabilities."

Kimberley A. Minkel, NFTA executive director, commented, "We are very fortunate that members of our Metro division have had the opportunity to collaborate with the IDeA Center to help improve [public transit](#) accessibility for our customers in a way that we could not accomplish on our own."

As the new NFTA buses hit the road, IDeA Center staff plan to partner with the authority to study whether the new design features are making a difference.

Research on the model bus will also continue, exploring issues including how well different types of ramps work, and how to improve wheelchair securement. The team will also alter the simulator to reduce its size from a clone of a full-scale bus to a smaller shuttle bus for additional study.

The model bus was built as part of a multifaceted, \$4.7 million Rehabilitation Engineering Research Center on Accessible Public Transportation that UB and Carnegie Mellon University established in 2008 using a grant from the National Institute on Disability and

Rehabilitation Research (NIDRR). Steinfeld co-directs the center with his son, Aaron Steinfeld, PhD, a researcher at Carnegie Mellon's Robotics Institute.

Provided by University at Buffalo

Citation: Buffalo is serving as an incubator for the bus of the future (2013, December 17)
retrieved 23 April 2024 from <https://phys.org/news/2013-12-buffalo-incubator-bus-future.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.