

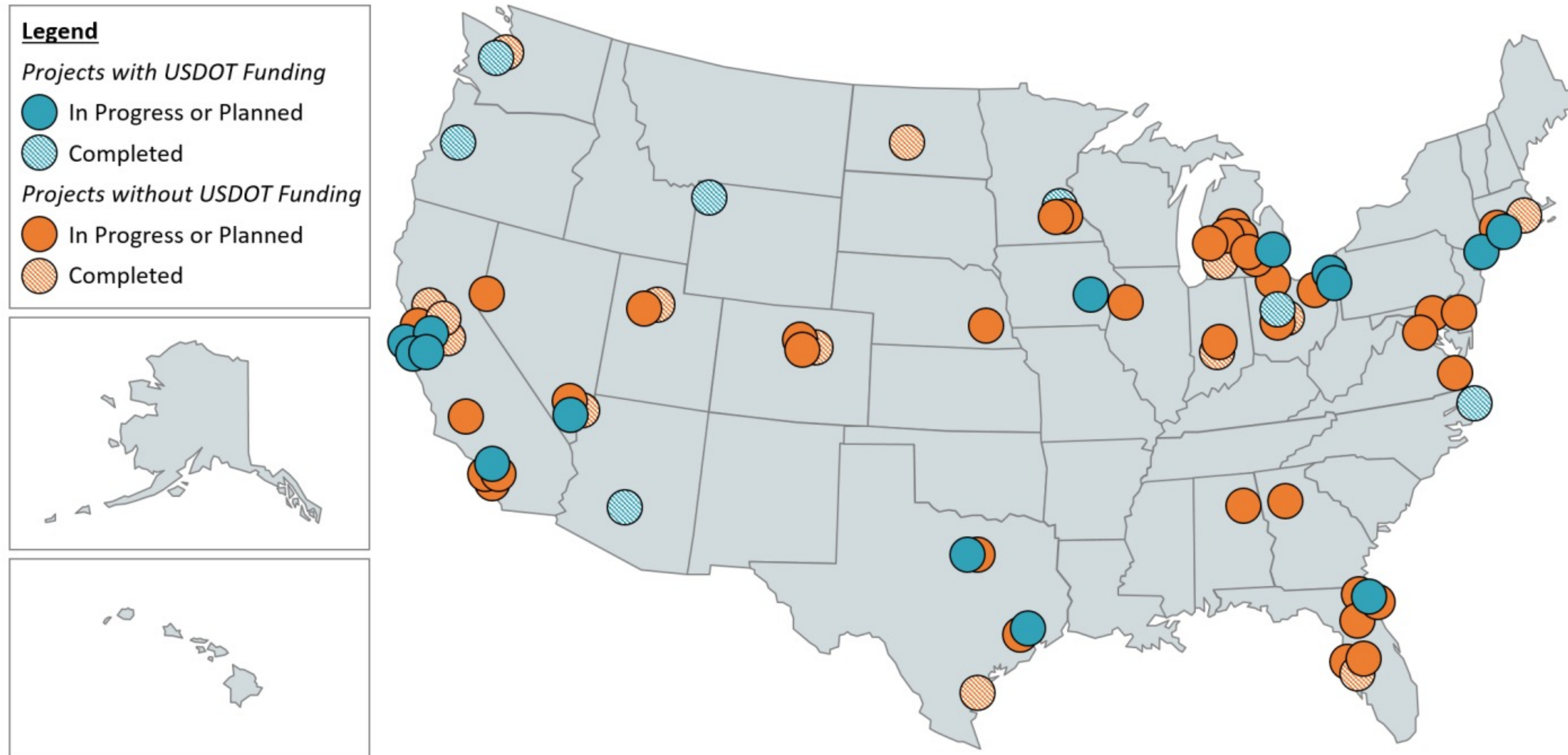


Co-Designing the Future of Transit Work

Imagining Driver Assistance Technologies
with and for Bus Operators



Automated Transit Pilots



“New Crashes”

“The automation [...] sometimes did things that pilots didn’t expect and sometimes it neglected to do things that they did expect.”



Who manages problems when they arise?

***On the Road.** Operators manage unpredictable roadway behavior and weather conditions that impede day-to-day operation, as well as activity like construction, special events, and more.*

***On the Bus.** Operators attend to the needs of elderly passengers and people with disabilities who require assistance. Operators regularly manage on-board situations such as assaults or medical situations.*

Contending with Adverse Road Conditions

Unpredictable pedestrian, cyclist, and passenger vehicle behavior in dense urban environments

As well as wildlife in more rural areas

Weather conditions that impede day-to-day operations

Road activity like construction, special events, and more



Expecting the Unexpected

“Always unexpected. Well, you always have to look out for the bears that decide they want to cross the road, the deer that decide they want to have a parade, the ducks and their babies, and just people.”

- Operator in rural Northeastern US

Attending to the needs of passengers

Providing critical information - to social services, hospitals, shelters, among other places

De-escalating potential conflict on the bus

Being watchful for what is happening off the bus through their role as driver

Intervening in the case of a medical emergency

Providing a sense of security and care in a public space



Keeping a Watchful Eye

“[W]e had an operator... He was traveling and he saw a car going into the canal. And he actually stopped the bus. And he jumped in the canal. It was a sister, a brother, and a baby. And they threw the baby because they couldn't swim. And they just told him to save the baby. But he was so tall, he was able to stand up. And people came to help him on the bank. And he went back in to save the sister and brother.”

- Operator in South Atlantic region of US

Shock Absorbers for Imperfect Automation

Rather than replacing workers outright, we expect automation to gradually transform the driving role of bus operators

Potential harms:

- *Punctuated moments of intense engagement*
- *Increased cognitive burdens*
- *Surveillance and heightened managerial control*

Toward a Just Future of Transit

Human operators will be essential in transit bus operations for the foreseeable future regardless of the level of automation

We should not develop and implement automated systems without the oversight of trained operators



Image source: Bloomberg

Follow our work

This is ongoing research, and we welcome your feedback and/or collaboration.

Feel free to reach out to our team by emailing sarahfox@cmu.edu. You can also follow along with project updates at our website (QR code and link →).



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