

**“Bus of the Future”
Redesign of Transit Bus Operator
Compartment to Improve Safety, Operational
Efficiency, and Passenger Accessibility
Program**

Speakers

- **Jack Clark:** Executive Director - International Transportation Learning Center/Transit Workforce Center (Moderator)
- **Christy Campoll:** Senior Associate - RLS & Associates Inc.
- **Brian Sherlock:** Safety Specialist - Amalgamated Transit Union
- **Mohammed Yousuf:** Director, Office of Infrastructure, Safety and Asset Innovation - Federal Transit Administration

Bus of the Future Team

- International Transportation Learning Center – Grantee
- Amalgamated Transit Union - Subject Matter Expertise
- STYL&TECH - Bus Operator Compartment Design
- AC Transit - Bus Donation and Employee Input
- RLS & Associates, Inc. - Project Coordination and ADA Compliance
- Safety Tech – Barrier and CMS Design
- USSC – Vibration-Isolating Operator Seat
- Q'Straint – Independent Wheelchair Securement

Defining the Problem

FOX 13 Investigates: UTA insists it's safe despite more than 150 assaults on drivers

The data we've acquired from 2013 to 2022 shows UTA's employees are being punched, kicked, shot at, and spit on at an unprecedented rate



NEWS

Bus drivers are punched and spit on. What's being done to protect them?



Hannah K. Sparling
Cincinnati Enquirer

Published 5:27 a.m. ET Aug. 20, 2018 | Updated 12:57 p.m. ET Aug. 20, 2018

ATTACKS ON NJ TRANSIT WORKERS TRIPLED. NEW NJ LAW WILL CRACK DOWN

Tulsa Transit Bus Driver Hospitalized After Assault By Passenger

Monday, August 15th 2022, 5:39 pm

By: News On 6

CRIME

Police: Suspect assaulted, spat on TriMet bus driver

by: Sam Campbell

2, 2022 /
22, 2022

'We didn't sign up to die': US transit workers sound alarm over rising violence

Unions say trend of assaults and abuse on staff is intolerable - and crisis will worsen without federal action



MARTCITIES **DIVE** Deep Dive Opinion Library Events

Transportation Buildings & Design Climate & Resilience Energy & Utilities Housing Tec

DEEP DIVE

Transit workers face growing rate of assaults: 'There's not much we can do'

Some transit operators are asking for reassignments off the frontlines as they face increasingly violent threats from frustrated riders amid COVID-19.

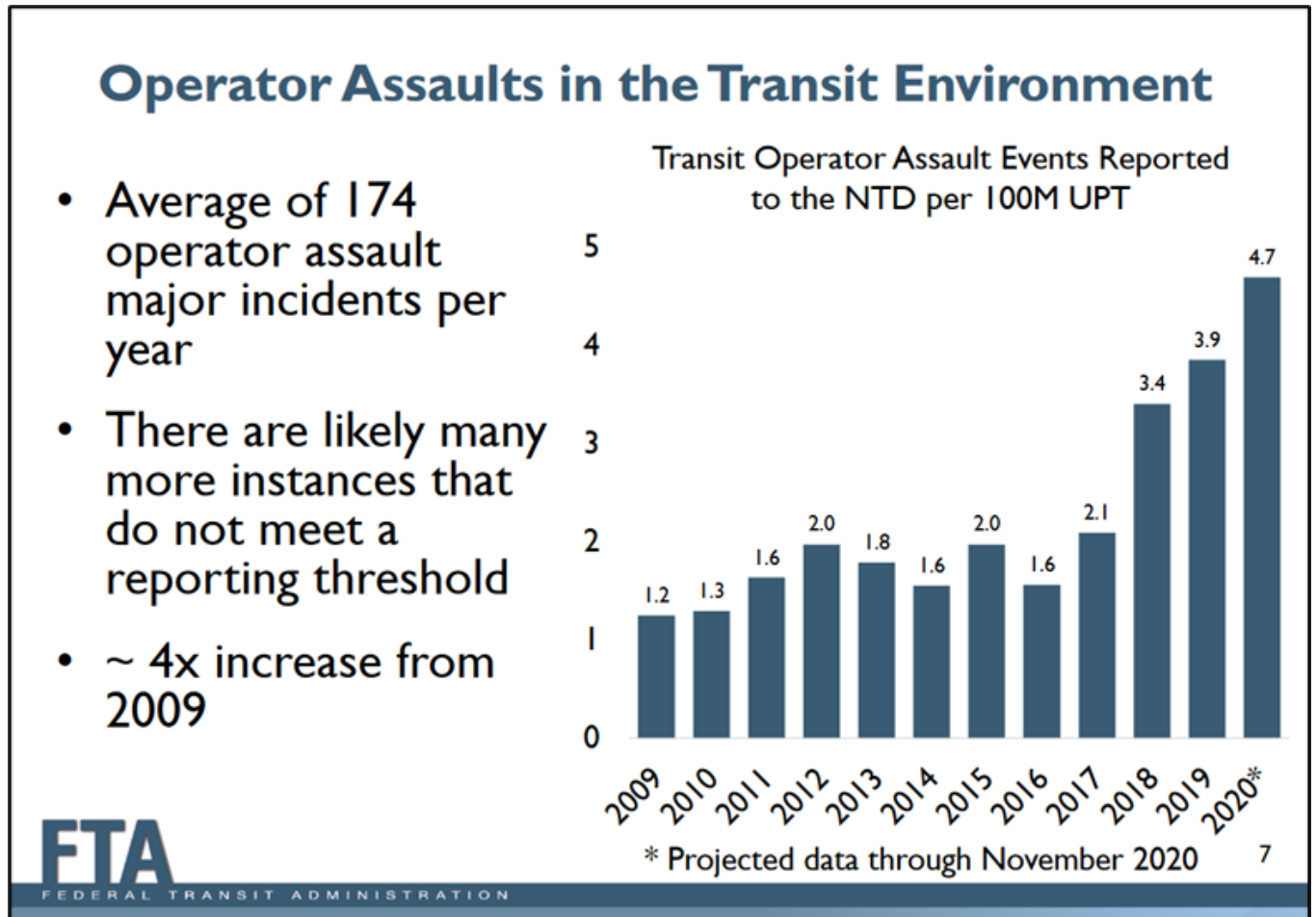
Published Feb. 17, 2021

FAST Act Requirements

- Address Problems Associated with Bus Operator Workstations
 - Protect from Growing Levels of Assaults
 - Reduce Blind Spots

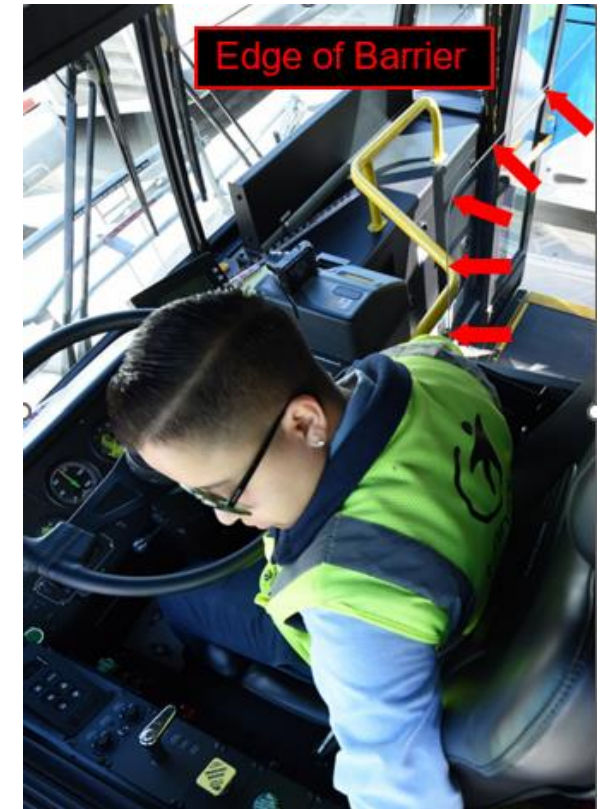
A Growing Problem

- FTA definition of operator assault changed in the BIL
- Slide represents data collected under old definition
 - Had to be hospitalized for 48+ hours
 - New definition defines assault as event that “interferes with, disables, or incapacitates a transit worker”



FTA Bus Redesign Objectives

- Ineffective Operator Barriers



FTA Bus Redesign Objectives

- Poor Operator Visibility



Driver's Arm

19 Pedestrians Hidden by the Pillar and Mirror

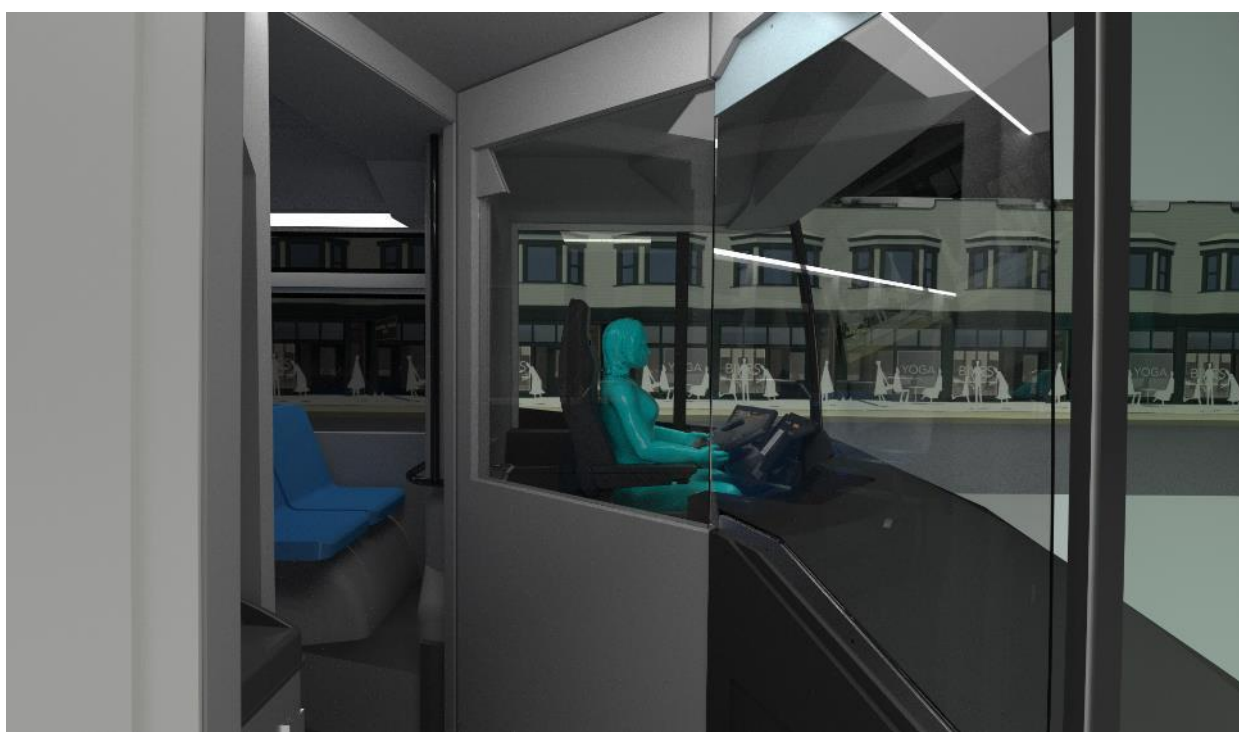


FTA Bus Redesign Objectives

- FAST Act Section 3020
 - Required the review of safety standards, practices, or protocols related to the bus operator workstation and its impacts on the reduction of blind spots and protection from assaults
- FTA Bus Operator Workstation Redesign—Design/Conceptual CAD Files
 - Increase operator safety
 - Increase operator visibility
 - Increase passenger accessibility
 - Improve operator ergonomics
 - Reduce operator distractions
 - ADA compliance

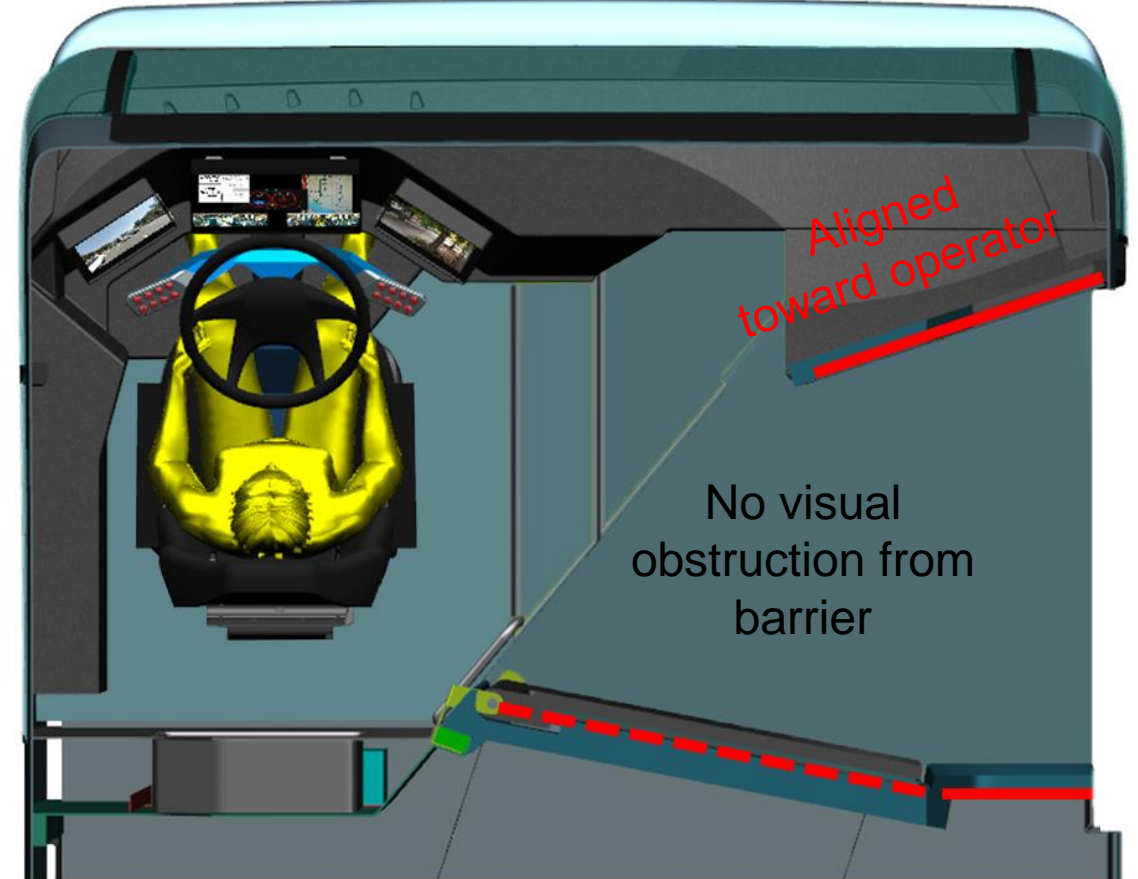
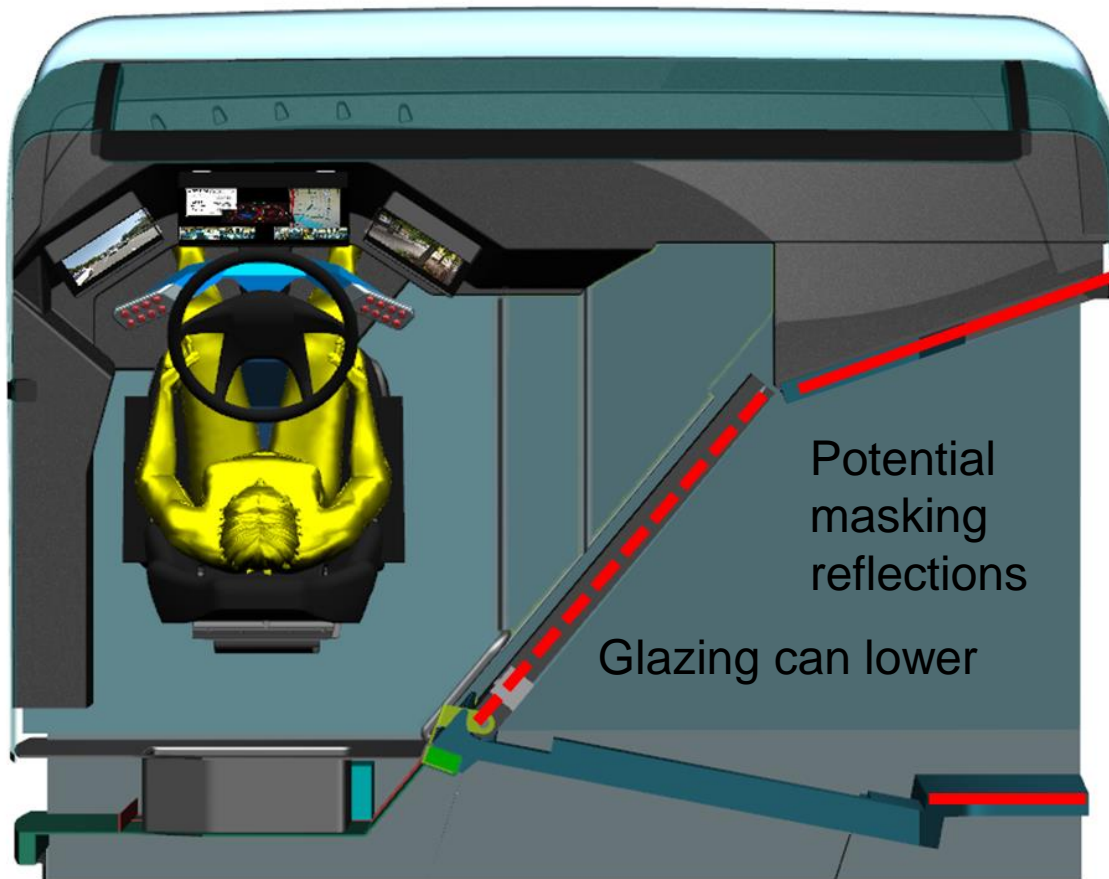
Design Solutions

Operator Workstation Solution



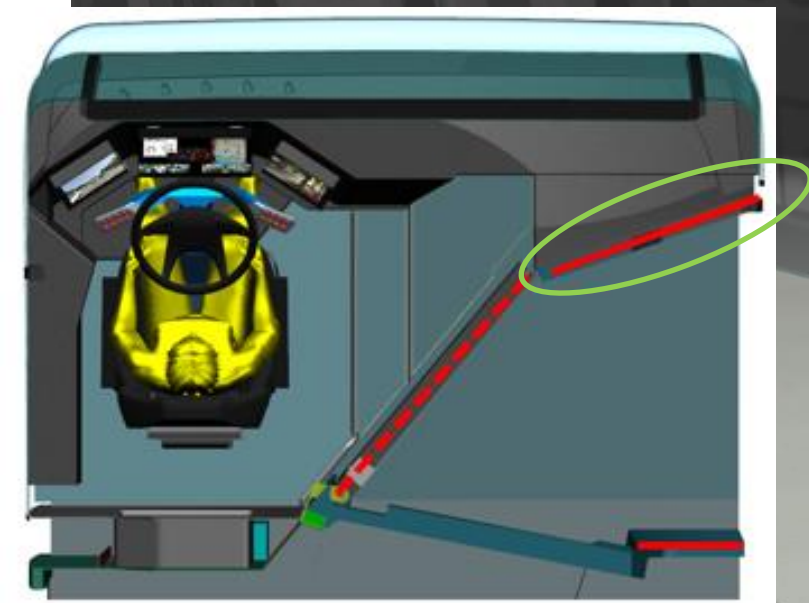
- **Maximum flexibility and security**
- **Positive pressure protection**
- **Stowable, pneumatic-powered barrier door glazing**
- **Options for eliminating barrier reflections**

Operator Workstation Solution



View from Operator's Seat

- The secondary panel design minimizes optical effects



Operator Workstation Solution



Optimized Direct and Indirect Vision



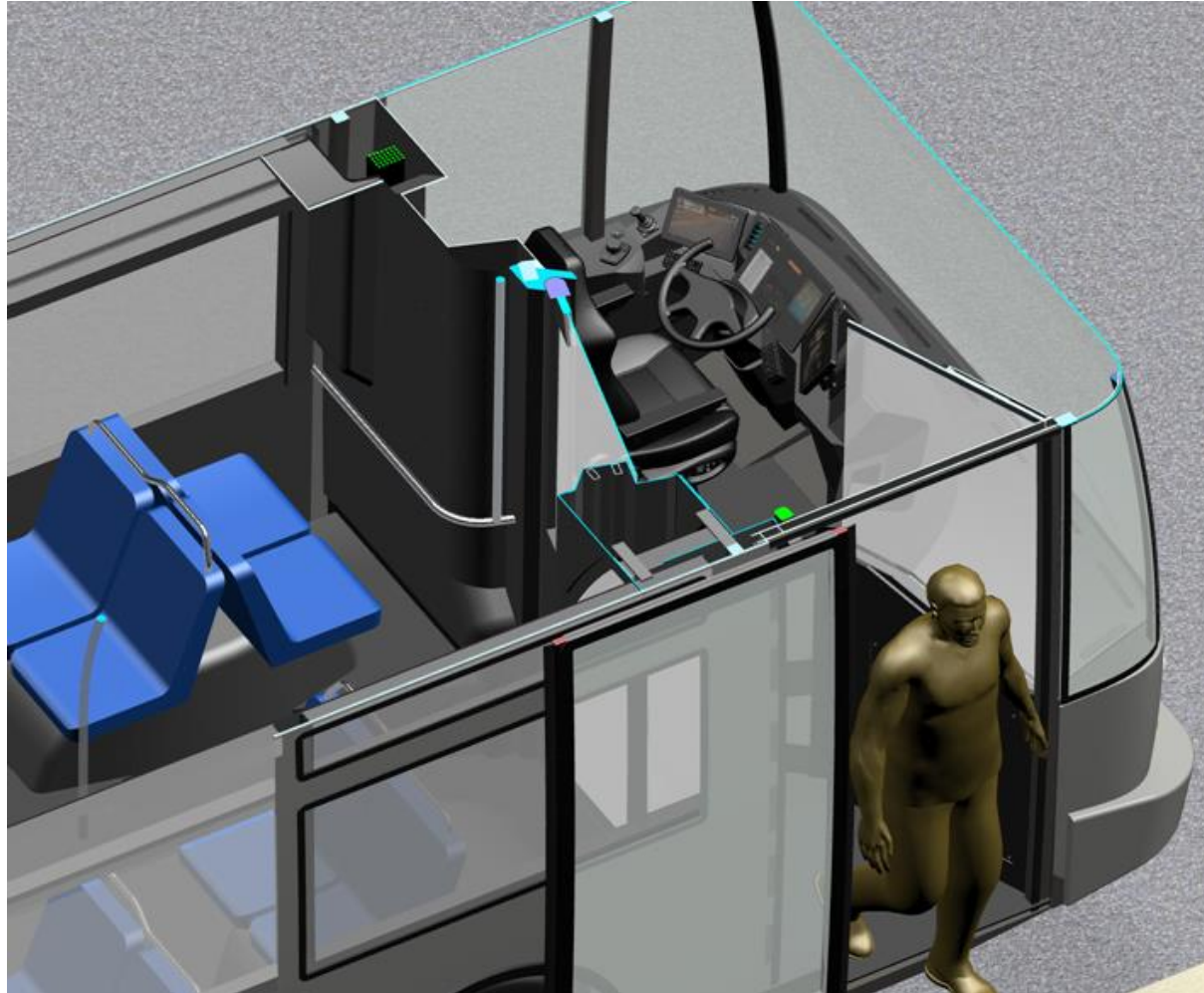
- Two screens replace four mirrors
- Near 360-degree view with lowered distortion
- Configurable center display for necessary information
- Lower operator cognitive load = less distractions

Improved Ergonomics



- **Suspended pedals to prevent lower quadrant injuries**
- **Electric over hydraulic steering – less upper quadrant injuries**
- **Active seat – 50% less whole-body vibration**

Operator Workstation Solution



Next Steps – The Challenge

Next Steps: Operator Compartment

- Refine CAD Files
- Component Specifications
- Expand Manufacturer Engagements
- Retrofit Examples
- Prototype Build and Testing



Next Steps: Passenger Compartment Redesign

- Under Discussion
 - Operator/Passenger Interface
 - Passenger Access
 - Boarding/Alighting
 - Maneuverability
 - Securement
 - Seating Configuration
 - Ride Quality & Safety



Input Needed!

- Target Audiences
 - Manufacturers
 - Operators
 - Technicians
 - Procurement Personnel
 - Passengers
 - People with Disabilities
 - Advocacy Groups



How Can You Help?

1. Incorporate BOTF Elements in Agency and Consortium Procurements
2. Encourage Manufacturers to Embrace BOTF Design Elements
3. Share Retrofit Solutions
4. Provide Input Into Specifications Development and Prototype Build



Conclusion

- Take our flyer!
- Complete the survey using the QR code on the flyer.
- Contact us:
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