

FEDERAL RAILROAD ADMINISTRATION OFFICE OF RESEARCH, DEVELOPMENT & TECHNOLOGY

Presentation to Next Generation Equipment Committee on Accessibility Research

Melissa Shurland
February 21, 2020



The NGEC will provide national leadership in standardization, acquisition, financing and management of passenger rail equipment.



Outline

- **Update on Rail Vehicle Access Advisory Committee Accessibility Recommendations**
- **FRA Accessibility Research**
 - **Occupant Experiments of Wheeled Mobility Devices and Anthropomorphic Test Devices**
- **Open Discussion**



The NGEC will provide national leadership in standardization, acquisition, financing and management of passenger rail equipment.

Update on Rail Vehicle Access Advisory Committee (RVAAC) Accessibility Recommendations



The NGEC will provide national leadership in standardization, acquisition, financing and management of passenger rail equipment.

US Access Board Issues ANPRM!

- The US Access Board issues Advance Notice of Proposed Rule-making to begin updating existing accessibility guidelines for rail vehicles – **Docket # ATBCB-2020-0002**
 - Public comments are being sought to regards to the recommendations from the Rail Vehicles Access Advisory Committee (RVAAC) letter to the board dated July 15, 2015
 - Comments are due **May 14, 2020**
 - Comments are being accepted via email, fax, mail or courier

<https://www.access-board.gov/guidelines-and-standards/transportation/vehicles/update-of-the-guidelines-for-transportation-vehicles/advance-notice-of-proposed-rulemaking>



Occupant Experiments of Wheeled Mobility Devices and Anthropomorphic Test Devices in a Full-scale Train-to-Train Impact Test



Melissa Shurland, Federal Railroad Administration
Dr. Katharine Hunter-Zaworski, Oregon State University
Kristine Severson, Volpe National Transportation Center



The NGEC will provide national leadership in standardization, acquisition, financing and management of passenger rail equipment.

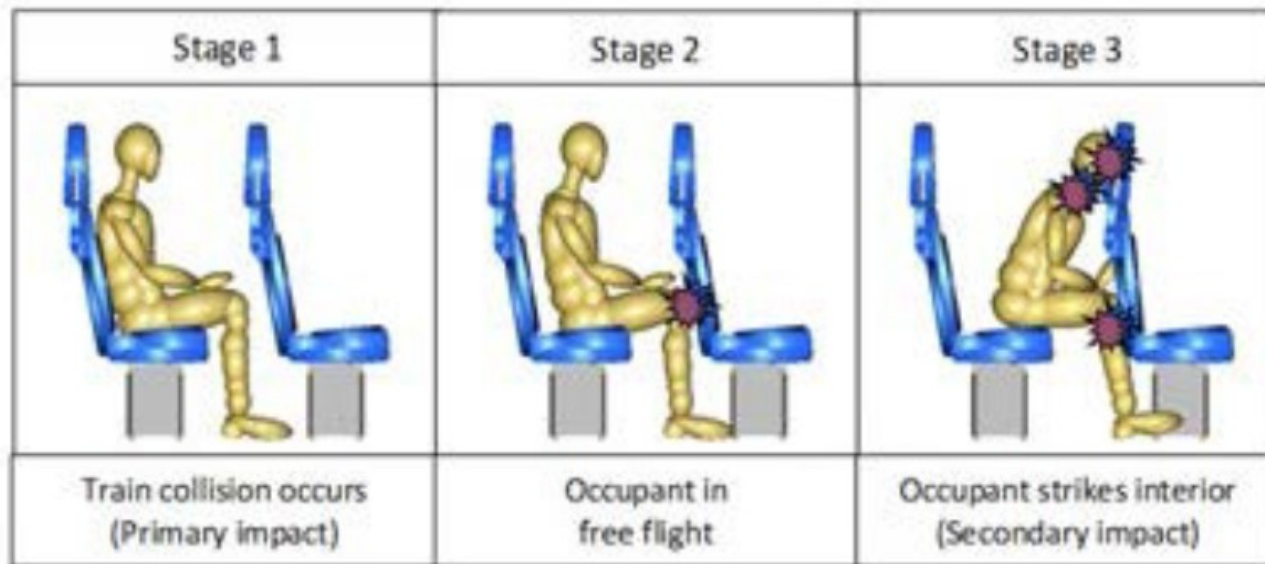
Background – RD&T Research

- The Federal Railroad Administration's (FRA) Office of Research, Development and Technology funds research to evaluate new technologies for improving occupant protection on passenger rail cars.
 - Past research has identified new technologies that can reduce injuries to passengers on rail cars in accidents
 - Improved design from tables used in rail cars
 - Improved strategies for designing seat layouts
 - Recommendations for luggage racks, emergency evacuation and preparedness requirements
 - Working with the NGEC Accessibility Working Group (AWG), FRA developed recommendations for improved accessibility on passenger rail vehicles.



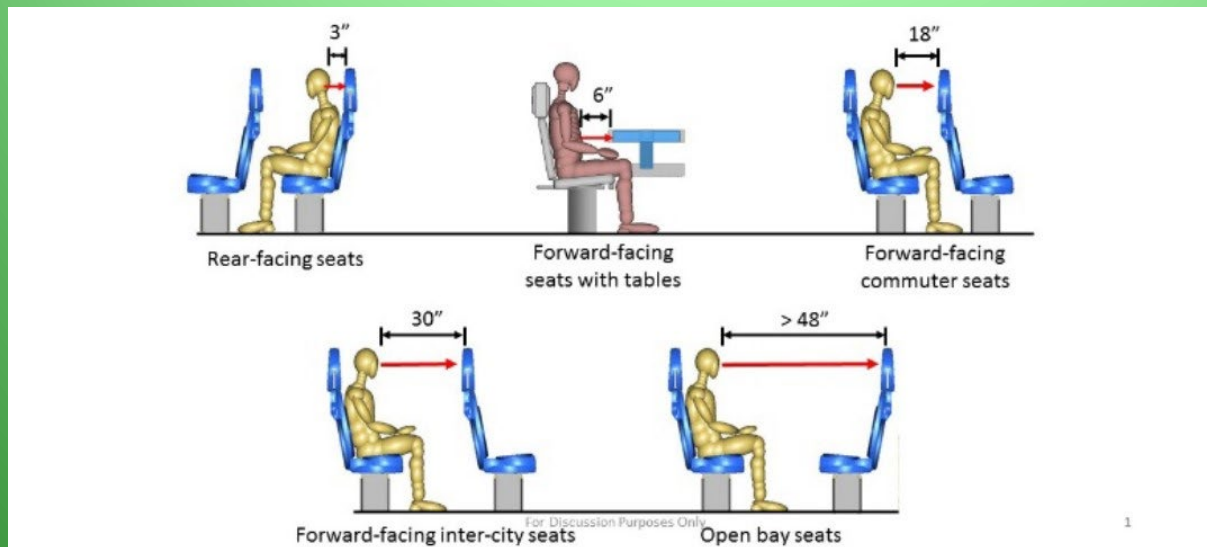
Background – Research on Occupant Protection

- Research on occupant protection showed that during collisions and derailments, secondary impact velocity is a concern.



Background – Research on Occupant Protection

- Research on rail car seating configuration identified deficiencies in, and developed strategies for improved passenger containment.



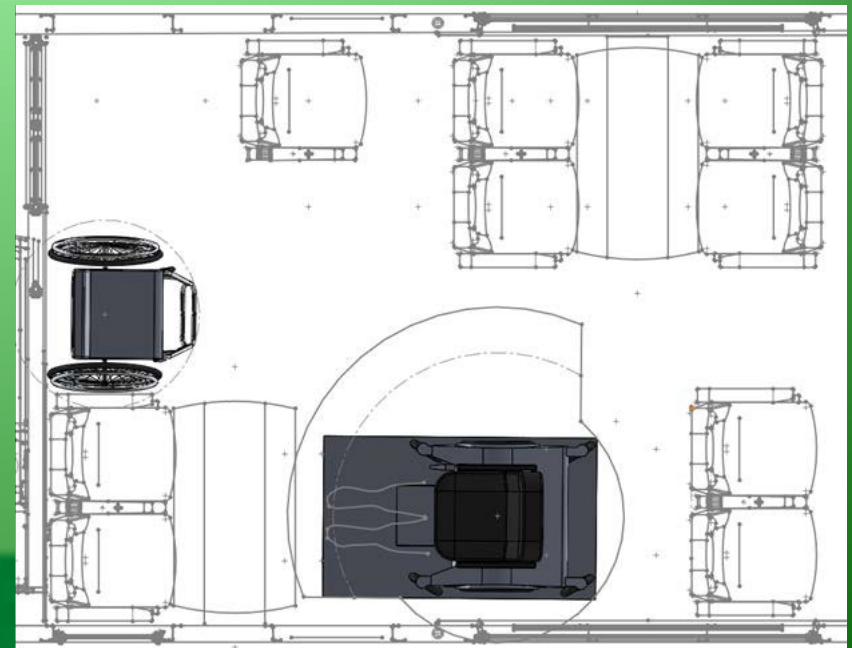
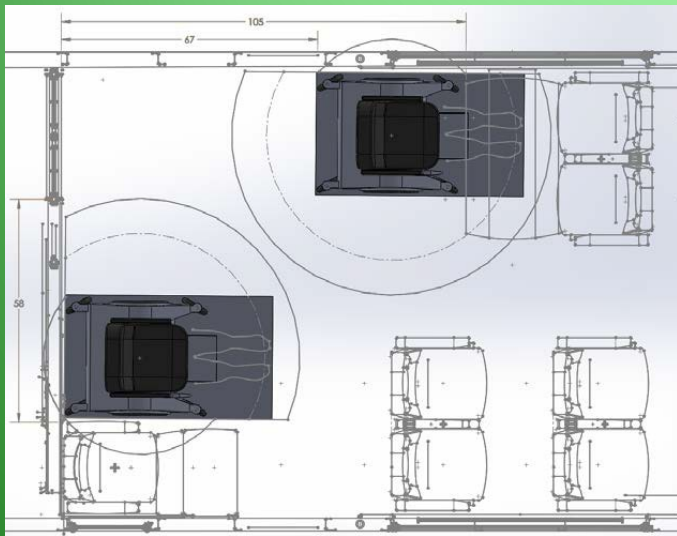
- FRA regulations and industry standards require row-to-row seating configuration for commuter and intercity passenger rail cars



The NGEC will provide national leadership in standardization, acquisition, financing and management of passenger rail equipment.

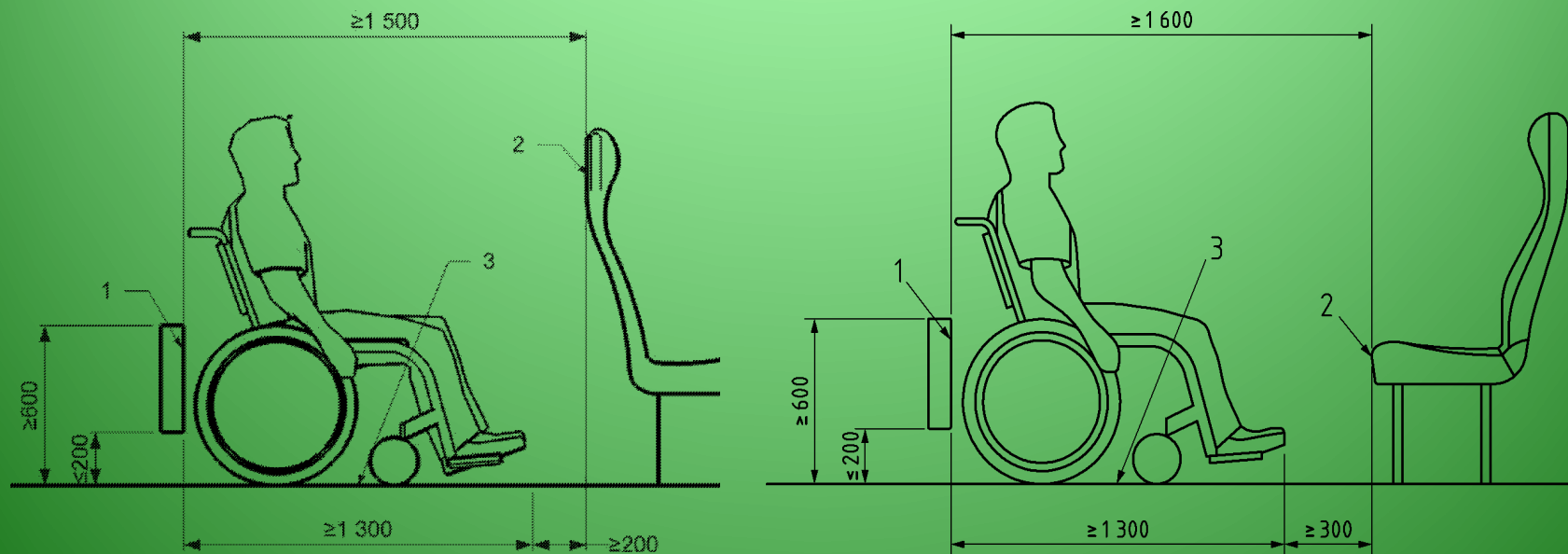
Background – Research on WhMD Spatial Study

- Results from spatial study of recommendations for larger accessible space raised an issue of containment of wheeled mobility devices (WhMD) and its occupant



Background – Research on WhMD Spatial Study

There has been no research on what is the appropriate level of containment for occupied WhMDs on passenger rail vehicles.



The NGENC will provide national leadership in standardization, acquisition, financing and management of passenger rail equipment.

Planned Test and Experiment

- FRA will be conducting a train-to-train test in 2020
 - T access crashworthiness features of passenger rail cars.
 - One moving powered car/locomotive will pull 2-3 passenger rail cars and impact a standing train consist.
- The train-to-train test presents an opportunity to conduct experiments we otherwise would not be able to conduct, cost-effectively.
 - Trailing rail cars will be outfitted with WhMDs and anthropomorphic test devices (ATDs) to access different strategies of passenger containment during the accident scenario.
 - The test will be conducted at the Transportation Technology Center in Pueblo, CO.



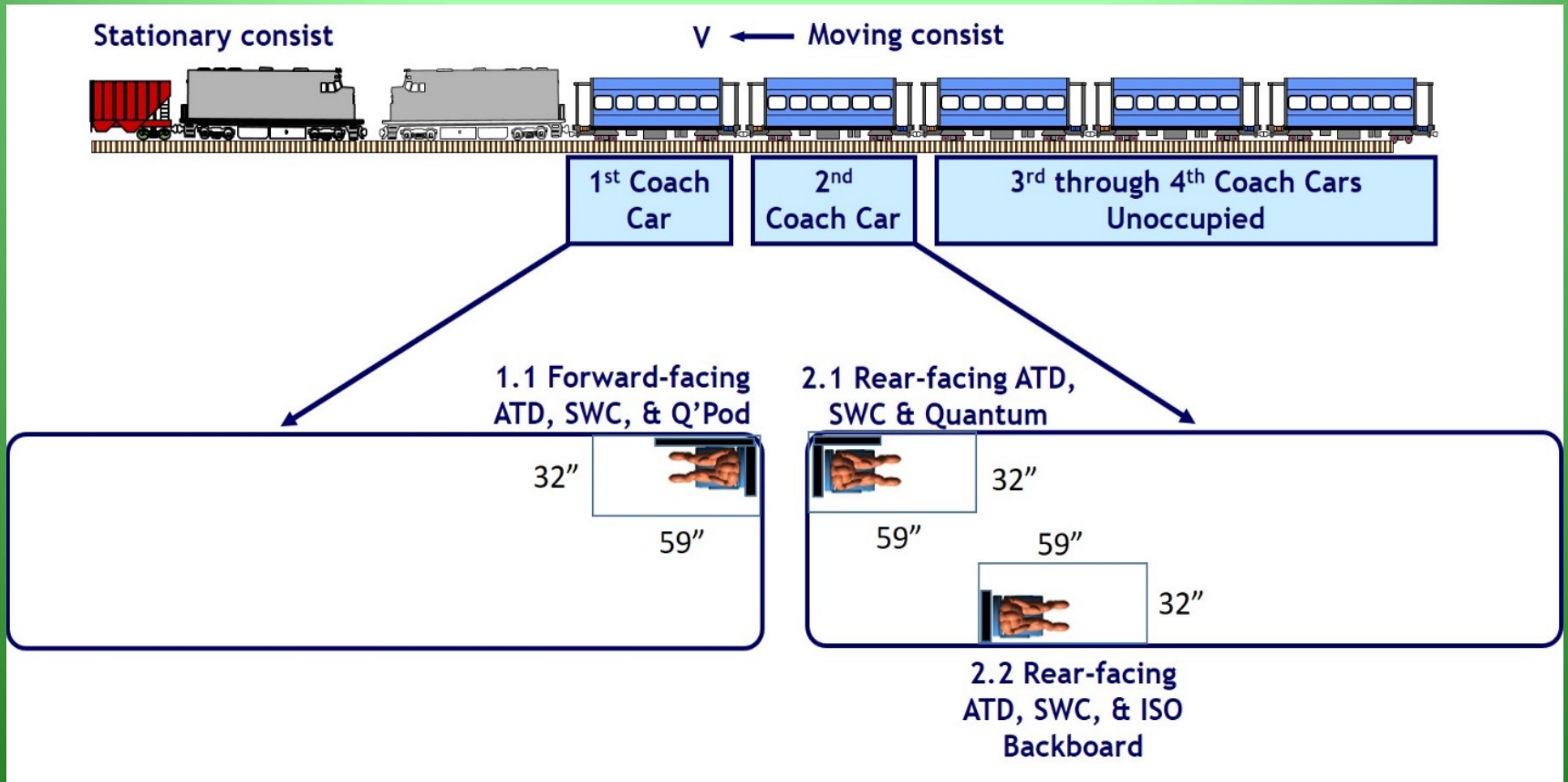
Objective of WhMD Experiments

- The purpose of the planned experiments is to test and evaluate the feasibility of, and protection provided by, active and passive containment strategies for passengers seated in WhMDs on passenger trains.



The NGEC will provide national leadership in standardization, acquisition, financing and management of passenger rail equipment.

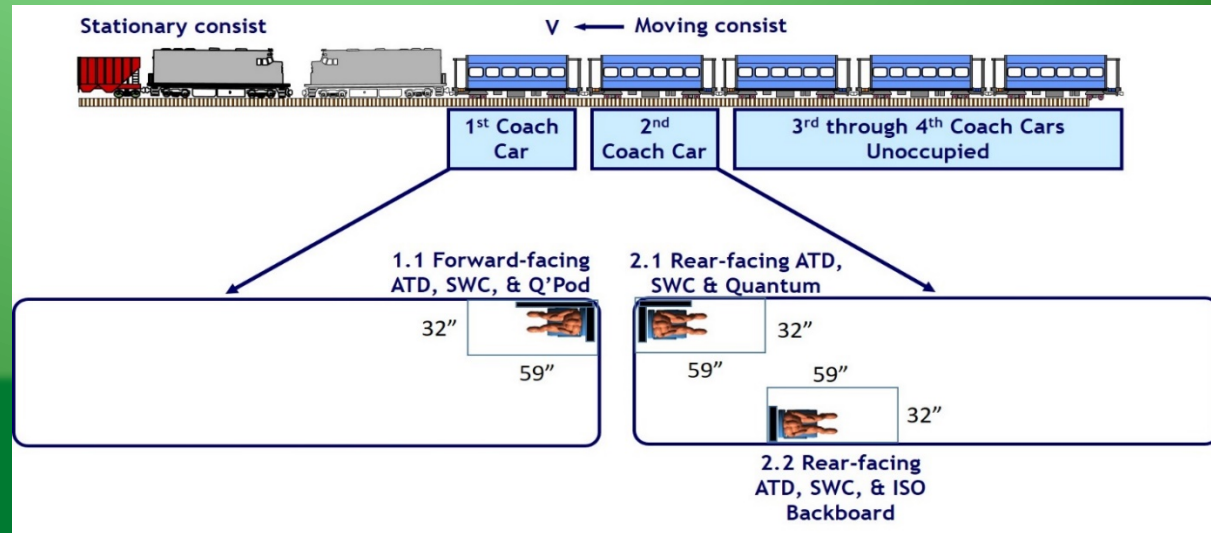
Planned Experiment Setup



Planned Experiment Setup

Three passenger containment strategies will be evaluated:

- ATD seated in WhMD secured in Q'STRAIT Q'Pod[®] securement system in forward-facing orientation
- ATD seated in WhMD secured in Q'STRAIT Quantum[®] securement system in rear-facing orientation
- ATD seated in WhMD in rear-facing orientation



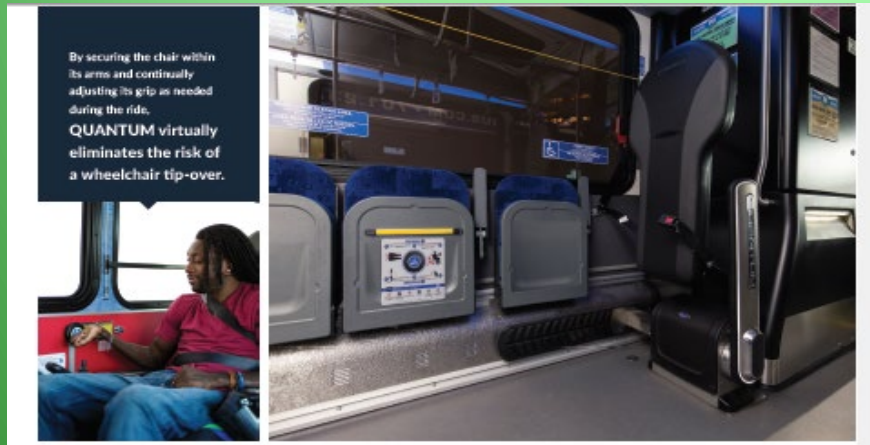
Containment of WhMD in Planned Experiment

- Q'STRAIT manufactures WhMD securement devices that are used on mass transit bus and rail (non-FRA regulated) systems in the US.
- One such device is the Q'Pod[®].
 - Forward-facing containment system



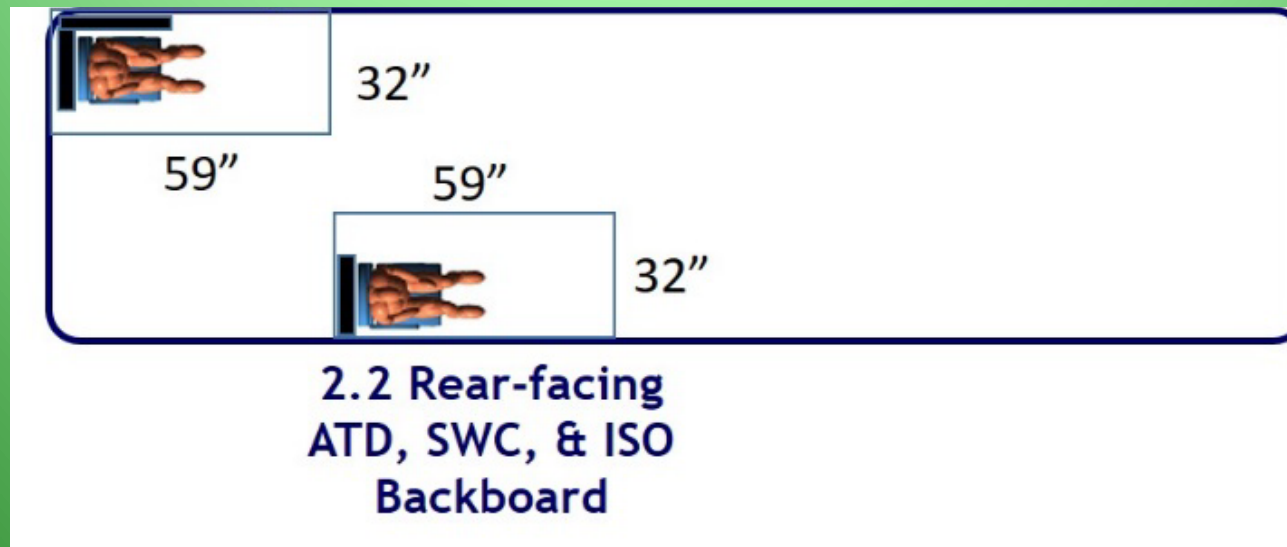
Containment of WhMD in Planned Experiment

- Another device is the Quantum[®] - Rear-facing securement system



Containment of WhMD in Planned Experiment

- Last containment strategy to be tested will be WhMD in rear-facing configuration against a ISO bulkhead.



Open Discussion

- FRA is open to testing any other modern securement systems used in transportation.
 - Please contact us with information regarding any other devices we should consider.
-
- Any Questions?



Melissa Shurland

Melissa.Shurland@dot.gov

202-493-1316



Thank You.



The NGEC will provide national leadership in standardization, acquisition, financing and management of passenger rail equipment.