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www.AllWheelsUp.org



ALL WHEELS UP, INC.

WHO IS ALL WHEELS UP?

- AWU is a 501(c)(3) non-for-profit organization
- AWU is the **ONLY** organization in the world crash testing wheelchair restraints for In-cabin use



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All Wheels Up



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THE ALL WHEELS UP TEAM



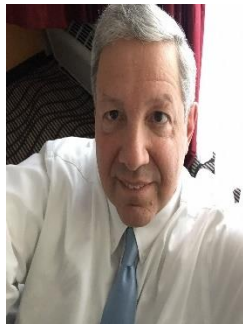
Michele Erwin
President /Founder



Alan Chalet
Vice President



Tinamarie Duff
Founding Board
member



Ralph Yaniz
Board member



Claudine Fuss
Founding Board
member



Greggory Donovn
Board Member / Aviation
consultant



Tamie Amoroso
Board Member /
Fundraising
committee

PROJECT MISSION

AWU Mission is to provide a wheelchair spot on planes for people with severe physical disabilities traveling on commercial, private & Medicalflight airplanes as well as provide an option during emergency evacuation situations

AWU KEY AREAS OF FOCUS

- ❑ Crash Testing Wheelchair Tie-Downs for commercial flight at contracted FAA approved facility
- ❑ University Research for supporting data
- ❑ Using AWU research to benefit evacuations during Disaster situations
- ❑ Raise the funds needed to conduct AWU research that will bring a wheelchair spot to the public

SCARECROW (AKA: AIR FORCE ONE), 1943

“the most powerful man in the world being carried like a baby...”
-Winston Churchill



The very first wheelchair accessible plane

1943 President Franklin D. Roosevelt flew in the first ever modified wheelchair accessible plane. The plane was outfitted with an elevator and an aisle and cabin space wide enough for FDR to use his wheelchair.

WC TIED DOWN ON MILITARY EXERCISES



FAA Reauthorization ACT (H.R. 2997) or 21ST Century AIRR ACT

- **SEC. 543. Feasibility study on in-cabin wheelchair restraint systems.**
- (a) Study.—Not later than 2 years after the date of enactment of this Act, the Secretary of Transportation, in consultation with the Architectural and Transportation Barriers Compliance Board, aircraft manufacturers, and air carriers, shall conduct a study to determine—
 - (1) the feasibility of in-cabin wheelchair restraint systems; and
 - (2) if feasible, the ways in which individuals with significant disabilities using wheelchairs, including power wheelchairs, can be accommodated with in-cabin wheelchair restraint systems.
- (b) Report.—Not later than 1 year after the initiation of the study under subsection (a), the Secretary of Transportation shall submit to the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report on the findings of the study.

AIR CARRIERS ACCESS ACT (1986)

□ **ACAA AMENDMENTS ACT OF 2017**

- *Section 9: Study on In-Cabin Wheelchair Restraint Systems* The United States Access Board will conduct a study to determine the ways in which individuals with significant disabilities who use wheelchairs, including power wheelchairs, can be accommodated through cabin wheelchair restraint systems. Further, DOT will put forward minimum guidelines consistent with the findings.

Current Documents under the FAA

FAA DOCUMENT TRANSPORTATION OF PATIENTS OF AIR AMBULANCE SECTION II 7.2

Passengers with known medical conditions and disabilities are covered under the Americans with Disabilities Act and the Air Carrier Access Act. These federal laws require commercial carriers to provide transport to those people with disabilities whose condition does not represent a threat to the health and safety of themselves or others. For example, paraplegics must be provided with seating on a commercial airliner and their wheelchair or transportation device carried at no extra charge. Paraplegics who have good upper body strength prefer aisle seating and can often transfer themselves from the special aircraft aisle wheelchair to the seat. **Quadriplegics will prefer cabin wall seating as providing more support on one side.** Bulkhead seating also provides more room for transfers. Seating can be specially requested and like all accommodations, should be done at least 48 hours before scheduled travel. Failure to provide 48 hours advance time may prevent the airline from accommodating a request, particularly in regards to oxygen. These levels have forced airlines and airports to make numerous changes to their facilities in order to accommodate the needs of the disabled. Spill able batteries from powered wheelchairs, normally considered to be unacceptable hazardous cargo, become a waived item requiring special handling.

ALL WHEELS UP PROPOSED SOLUTION



Evaluation of the following for transport plane purposes

- Wheelchairs
- Tie-Down Occupant Restraint Systems
- Occupant Protection

WHEELCHAIR TIE-DOWNS

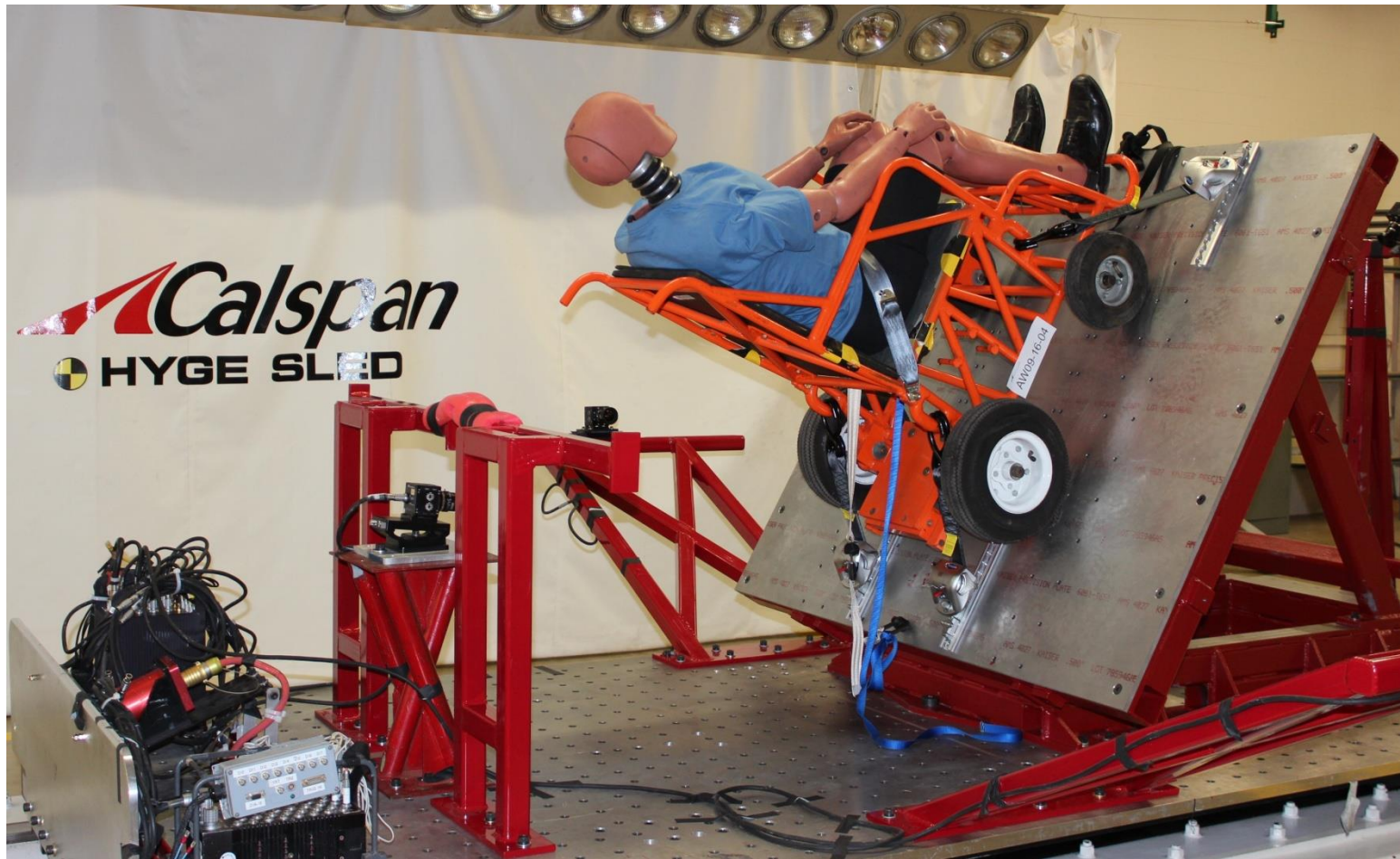
- In 2011, Q'Straint wheelchair tie-down occupant restraint system passed a 20G sled crash test
- This **surpassed** the 16G sled test of airplane seats that the FAA has set as the industry standard

THE 16G RULE

- According to the AC25.562-1 B “a single 16G longitudinal or 14G vertical test is sufficient to substantiate the attachment between structural members with a different design philosophy or variations within the same design philosophy, provided it can be determined which test conditions is critical for the attachment” (Bahrami, 2006).

AWU MAKES HISTORY

14 CFR 24.562



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TIE-DOWN RESTRAINTS

- AWU has already tested this wheelchair tie-down and occupant restraint system (WTORS) – **QRT-360**
- A surrogate wheelchair was used (the same surrogate wheelchair used in automobile crash tests)
- Airplane floors have the same or similar “L” track as the accessible vans and buses

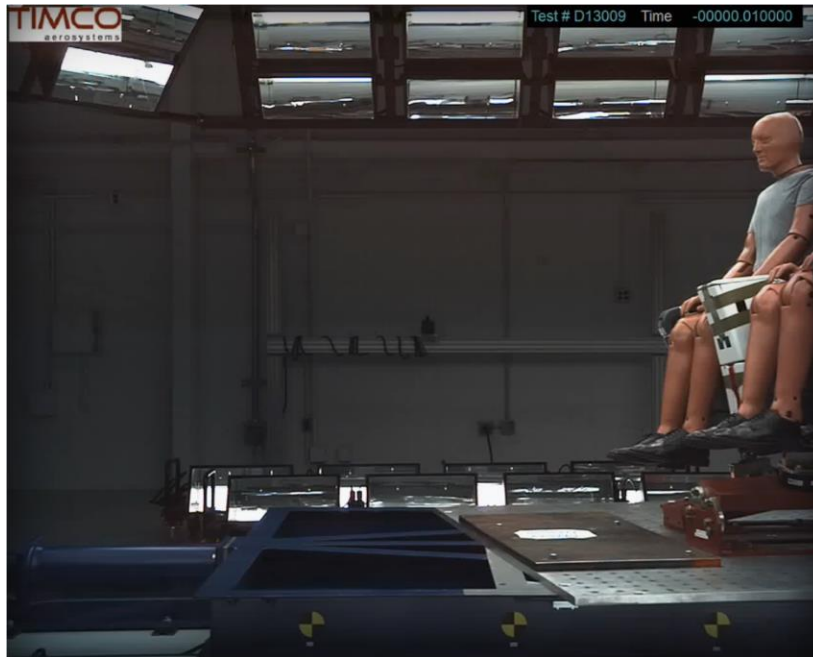


AEROSPACE TESTING STANDARDS

- Tested according the FAA standards for in-cabin use
 - the same test for airplanes seats, drink carts etc
- **14CFR25.561 & 562**
 - Title 14 = Aeronautics and space
 - CFR = Code of federal Regulations
 - Part 25 - Airworthiness standards::
 - .561 = General Aviation
 - .562 = emergency landing dynamic conditions

16G PULSE TEST

AIRPLANE SEAT CRASH TEST – 16G



All Wheels Up Crash Test – 16G



OTHER TIE-DOWNS PLANNED FOR TESTING

- ▣ QUBE



- ▣ QUANTUM



- ▣ QLK – 110 or 150



ADDITIONAL TESTING

**BEFORE ACCESSIBLE FLIGHT IS POSSIBLE,
MORE TESTING IS NECESSARY**

- ❑ ALL MANUAL AND POWER WHEELCHAIR MODELS
- ❑ HEAD RESTS
- ❑ SEAT BELTS & RESTRAINTS (NOT LAP BELTS)
- ❑ BATTERIES (BATTERIES HAVE BEEN TESTED FOR TRANSIT FLIGHT)
- ❑ STRUCTURE OF THE AIRPLANE FLOOR

OTHER AREAS OF RESEARCH

- WHITE PAPER STUDIES:
 - ▣ FOCUSED ON WC USER PHYSICAL SAFETY
 - ▣ WOULD RIDERSHIP INCREASE IF WHEELCHAIR USERS WERE PROVIDED A WHEELCHAIR SPOT ON PLANES

- TARMAC TURN TIME SAVINGS
 - ▣ UNIVERSAL DESIGN/SIMULATION OF WC USER USING A WHEELCHAIR SPOT IN-CABIN

ANIMATION OF PROPOSED SOLUTION

Find this video and share:

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STRATEGY MOVING FORWARD

□ FUNDING

- GOVERNMENT FUNDING
- OUTSIDE FUNDING (Foundation, Sponsors, Individuals, Advocacy Groups)

□ PARTNERSHIPS

- Airlines, Plane Manufacturers, Wheelchair Manufacturers, Universities

ESTABLISHED PARTNERSHIPS

- **ADVOCY GROUPS** – Open Doors Organization
- **AIROSPACE REGULATORS**– FAA/CAA/EASA
- **CAMI** (Civil Aviation Medical institute)
- **Universities** (University of Buffalo, University of Michigan, Johns Hopkins University)
- **The United States Access Board**
- **Q'Straint** - Leading Manufacturer of wheelchair restraint systems
- **STANDARD ORGANIZATIONS:** ANSI (American National Standard) RESNA (Rehabilitating Engineering and Assistive Technology Society of North America, ISO (International Standard Organization), SAE (Society of Automotive Engineers)

TAKE AWAY

- ❑ WHEELCHAIR ACCESSIBLE AIR TRAVEL WILL HAPPEN
- ❑ ALL WHEELS UP IS THE ONLY ORGANIZATION CONDUCTING CRASH TESTING
- ❑ WORKING TOGETHER TOWARDS PARTNERSHIPS AND FUNDING

SPECIAL THANKS TO:

- ❑ Q'STRAIT (USA/UK)– DONATION OF RESTRAINTS AND SURROGATE WHEELCHAIR
- ❑ CALSPAN (USA)
- ❑ FAA (USA) -
- ❑ ISTAT FOUNDATION (USA) – PROVIDED FUNDING
- ❑ LIGHT THE WORLD (HOLLAND)- PROVIDED FUNDING
- ❑ OPEN DOORS ORGANIZATION – PROVIDING FUNDING
- ❑ UNICO (USA) – PROVIDED FUNDING

OUR SUPPORTERS



Parent Project
Muscular Dystrophy

LEADING THE FIGHT TO END DUCHENNE



Paralyzed Veterans
of America



Open Doors
Organization



United Spinal
Association

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Questions?

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References

- Bahrami, A. (2006). Dynamic Evaluations of Seat Restraint Systems and Occupant Protection on Transport Airplanes. Federal Aviation Administration. *Advisory Circular (AC 25.562-1B)*. Q'Straint. (n.d.). Retrieved June 2011, from www.qstraint.com.
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