



# Flying With Disabilities

USP-STANFORD-EMBRAER

01

Meet the team



Erika Finley  
Mechanical  
Engineering



Maria Barrera  
Mechanical  
Engineering



Guilherme Kok  
Industrial  
Engineering



Luiz Durão  
Industrial  
Engineering



Amanda Mota  
Product  
Design



Rodrigo Aquino  
Computer  
Engineering



**EMBRAER**

## 02 Introduction



**Disability affects 11%**  
of the population

↑ Noise-Induced **Hearing Loss**

↑ Road Traffic **Accidents**

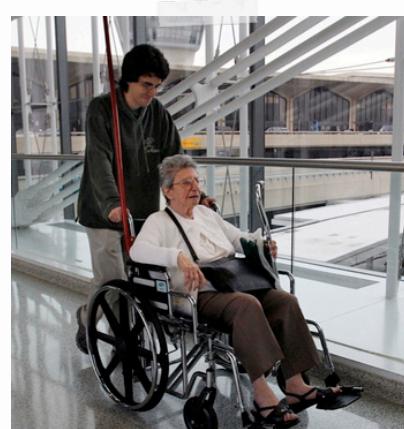
↑ **Aging** population

↑ **Obesity**

**DISABILITY TREND**

## 03 The Problem

**“**Passengers should be able to have the same experience, regardless of their physical or mental condition. **”**



Reduced mobility  
or any kind of  
disability



Enhance  
mobility

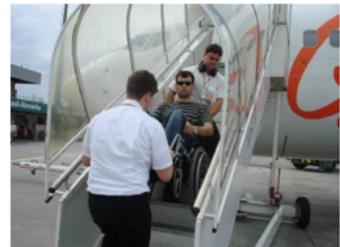


All stages of  
air travel  
experience

## 04 The Flight Experience is Broken



**“**They strapped me up like Hannibal Lecter. I had to ride with my arms crossed to ensure I passed. I was forced to ignore all embarrassment issues. **”**



## 05 The Flight Experience is Broken

**Status Quo Like a fish out of water**

## 06 Our Vision

# Our Vision

## 07 User Perspectives



**Teri Adams**  
Asst. Director of the  
Stanford  
Office of Accessible  
Education  
*Wheelchair User*



**Cid Torquatto**  
Coord. at the Sao Paulo State  
Secretariat for the Rights of  
Persons with Disabilities  
*Wheelchair User*



**Jose Luis Naranjo**  
28-Year Old T6 Paraplegic  
*Wheelchair User*



**Scott Rains**  
Travel and Cruise Specialist;  
*Wheelchair Travel Blogger*

**“**We all feel disabled in some way. We all feel imperfect. It's hard to be looked at for various reasons. **”**



**Nanci Linke-Ellis**  
Board of Trustee for Hearing  
Loss Assoc. of America  
*Deaf Traveler*



**Cheryl Echevarria**  
President of NFB Travel  
and Tourism Division  
*Owns Travel Agency*

## 08 User's Pain Points



Lack of Independence



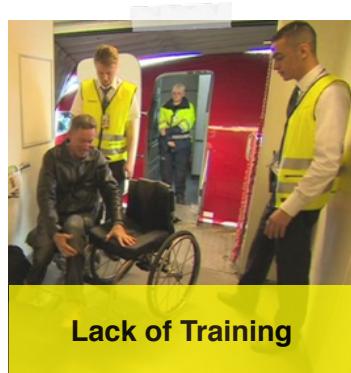
Seating Preferences



Lack of Assistive Technology



Lack of Redundancy When Communicating



Lack of Training



Broken Wheelchairs

## 09 Flight Crew Perspectives



**Nikole Rubyn**  
Virgin America  
Founding Flight Attendant



**Dena Silva-Heath**  
Alaska Airlines  
Flight Attendant



**Anonymous**  
Brazilian Airline  
Flight Attendant



**Yonatan Godefa**  
Virgin America  
Gate Agent

## 10 Flight Crew's Pain Points

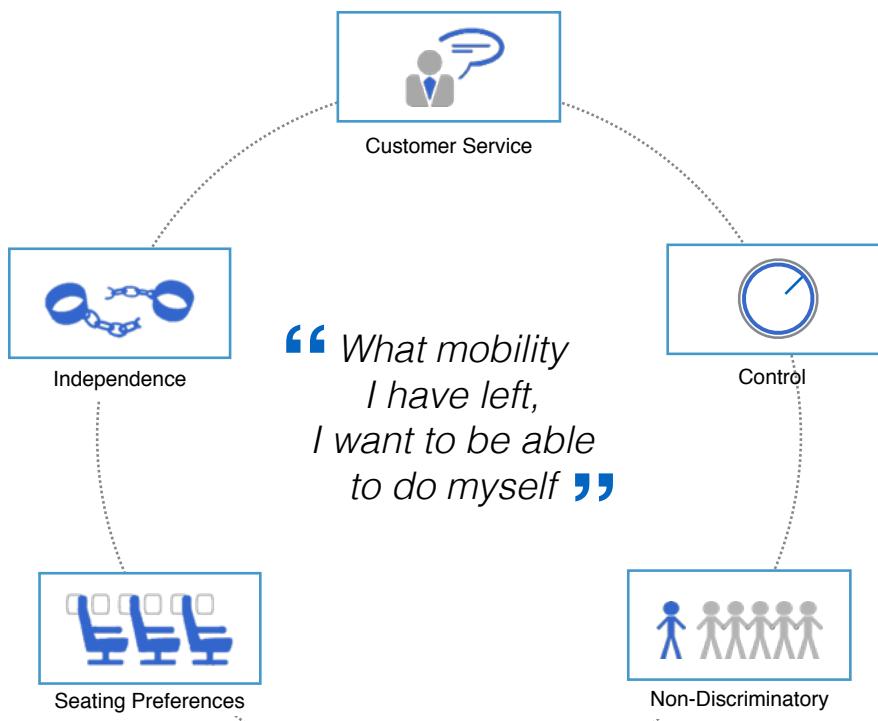


Passenger Preparation



Other Passengers

## 11 Themes

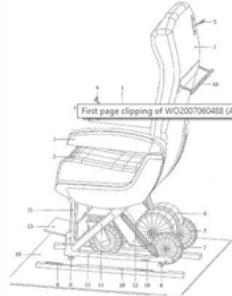


## 12 Patents

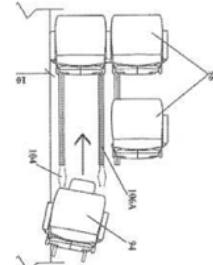
**“ Why are seats on planes fixed? ”**



Amanda Mota | USP



Seat with  
wheels



Removable  
Seat

## 13 Benchmarking



Van Lift for  
Wheelchair



Wheelchair  
Latching



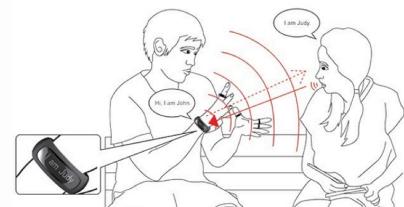
Stand-up  
Wheelchair



Detachable  
Wheelchair



Manual  
Aisle Chair



Sign Language  
Ring

14 Swivel Chair: Critical Function Prototype

# SWIVEL CHAIR STANFORD UNIVERSITY

15 Swivel Chair: How & Why



Independence



Seating Preferences

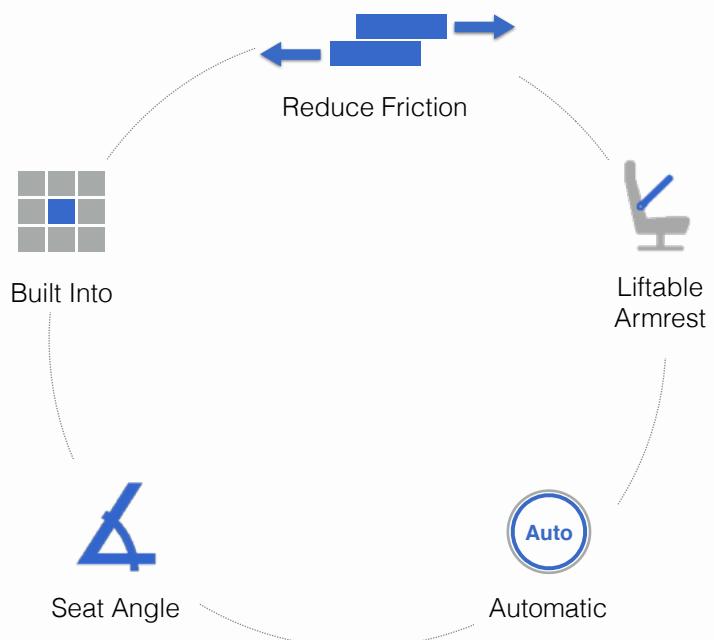


Non-Discriminatory



Control

## 16 Swivel Chair: Main Takeaways



## 17 Seats on Rails: Critical Function Prototype

**Seats With Rails Claymotion**

## 18 Seats on Rails: How & Why



Non-Discriminatory



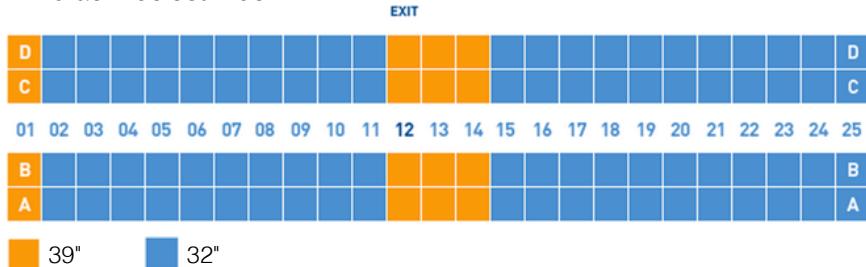
Seating Preferences



Independence

Rodrigo Aquino | USP

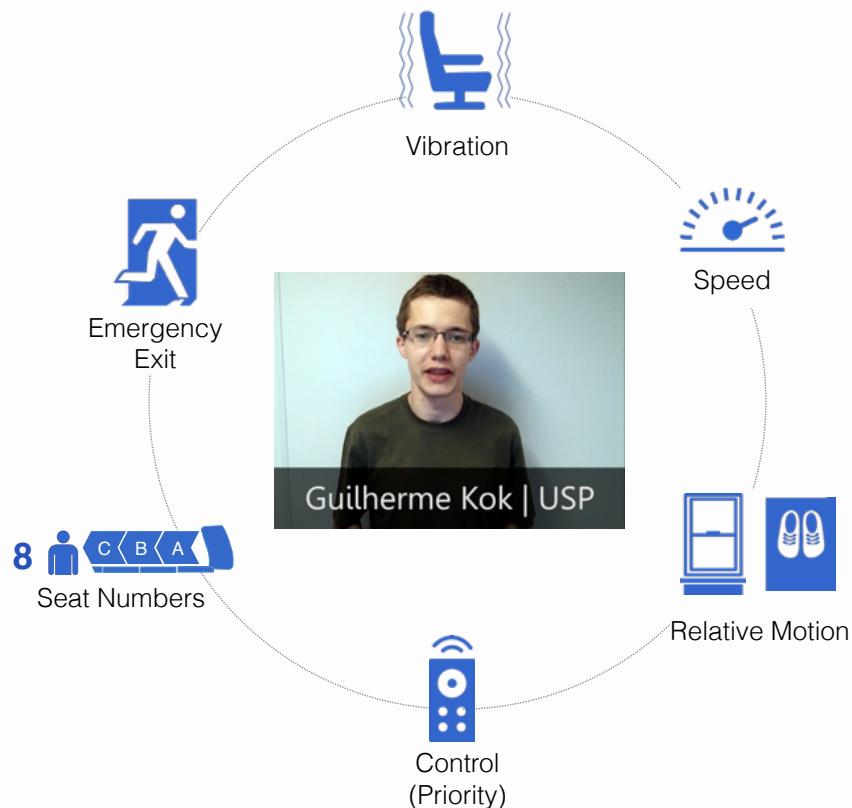
Embraer 190 Jet Blue



Available adjustable space

- Front Rows: 29"
- Rear Rows: 22"
- Emergency seats: 0"
- +Empty rows: 100%

## 19 Seats on Rails: Main Takeaways



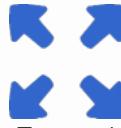
## 20 Next Steps



&



Futuristic Approach



Expand Current Solution



Crazier Ideas



Human Approach

**Airplane:** Look into a more dynamic cabin, why can't it be more like a party?

**Team:** Welcome our new team members!