

# M.O.V.E.

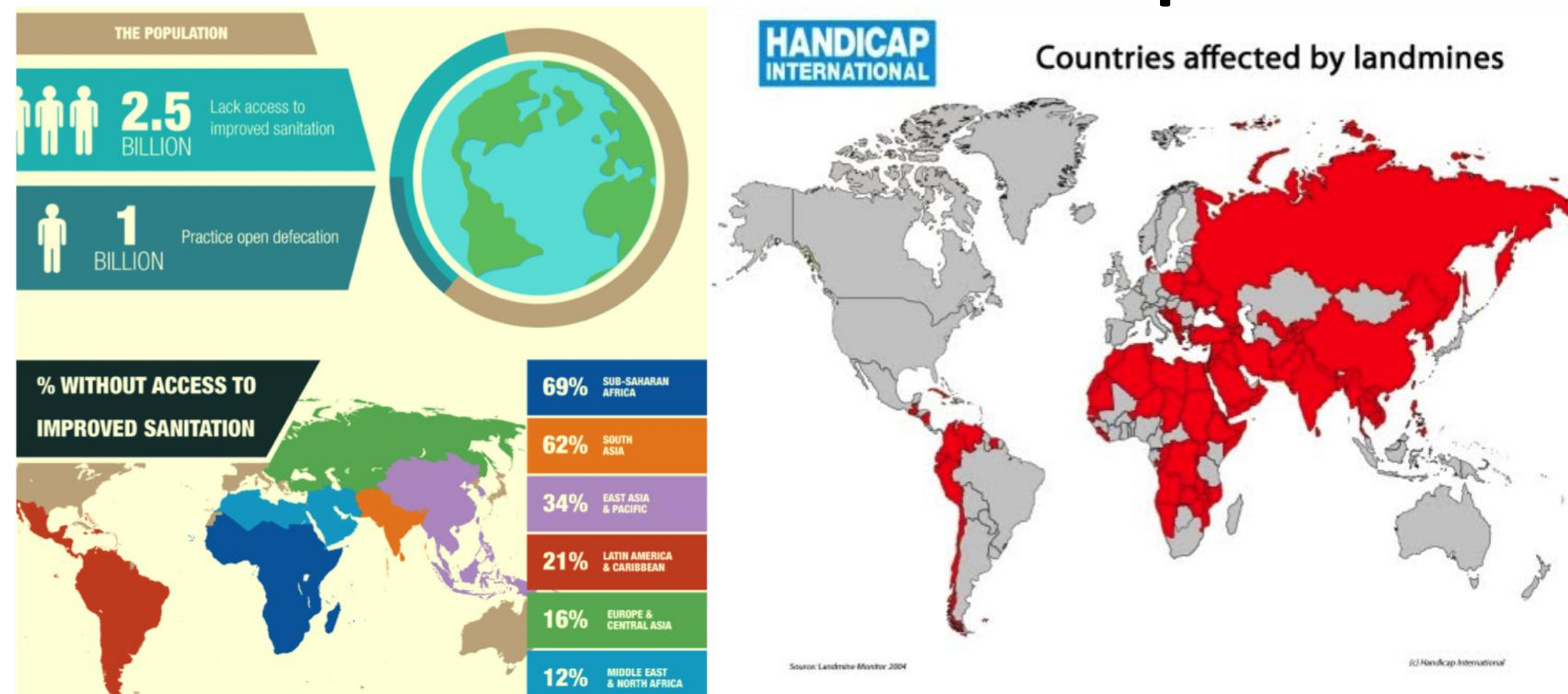
## (Mobility, Opportunity, Versatility, Empowerment)

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### Problem Landscape



- About 33% of the world does not have access sanitary toilet facilities, most in countries affected by landmines
- In Uganda alone, there over 2400 landmine survivors (the-monitor.org)
- Negative societal stigmas in third world countries make it difficult for individuals with disabilities to reintegrate into society

### Goal

- Help increase the mobility of landmine survivors and other individuals with disabilities, and help them to use pit latrines in a safe and sanitary manner

### Customer Requirements



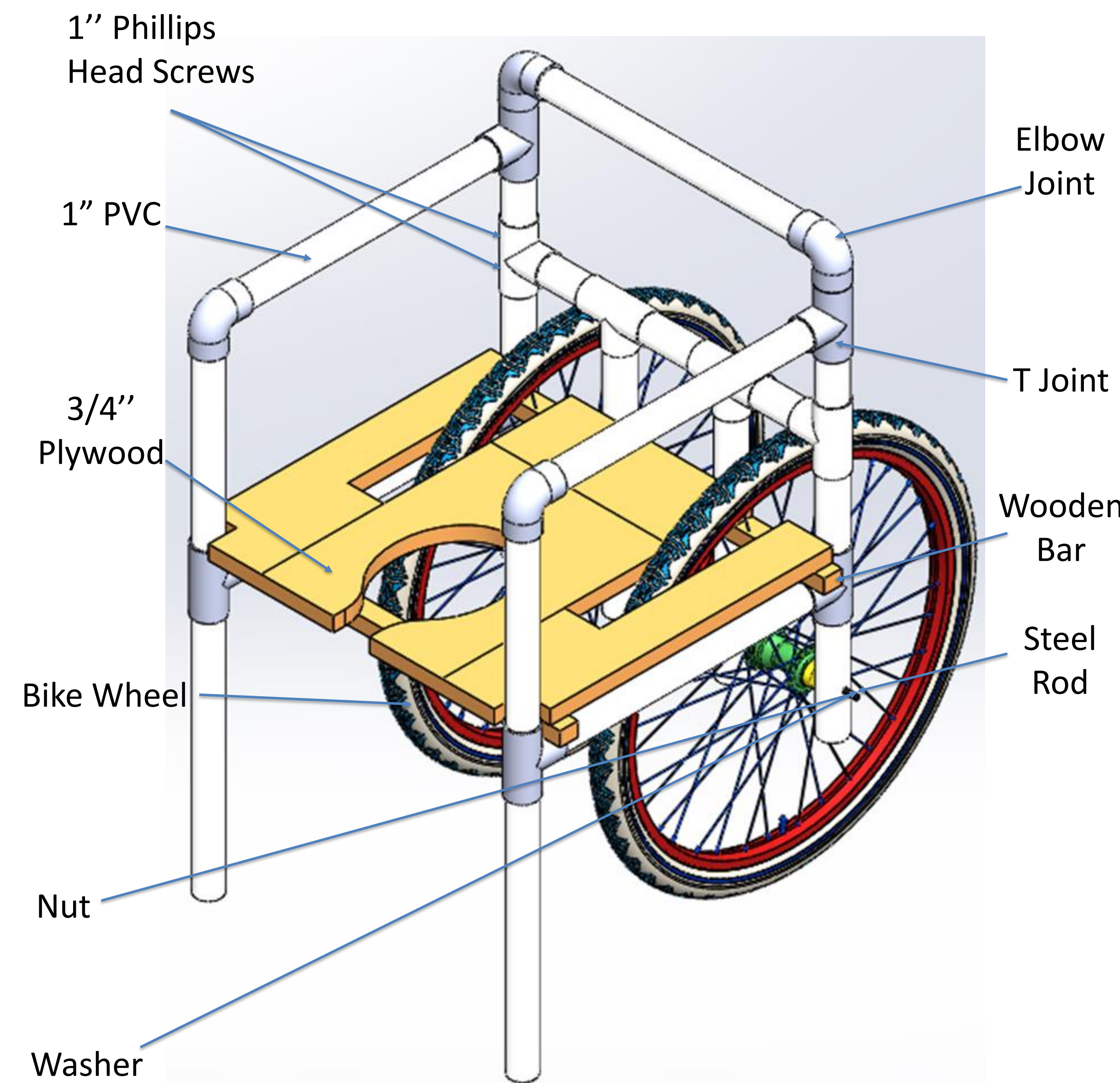
#### Physical:

- Holds up to 250 lbs
- Wheels
- Brake system
- Insettable toilet seat
- Stable on uneven terrain

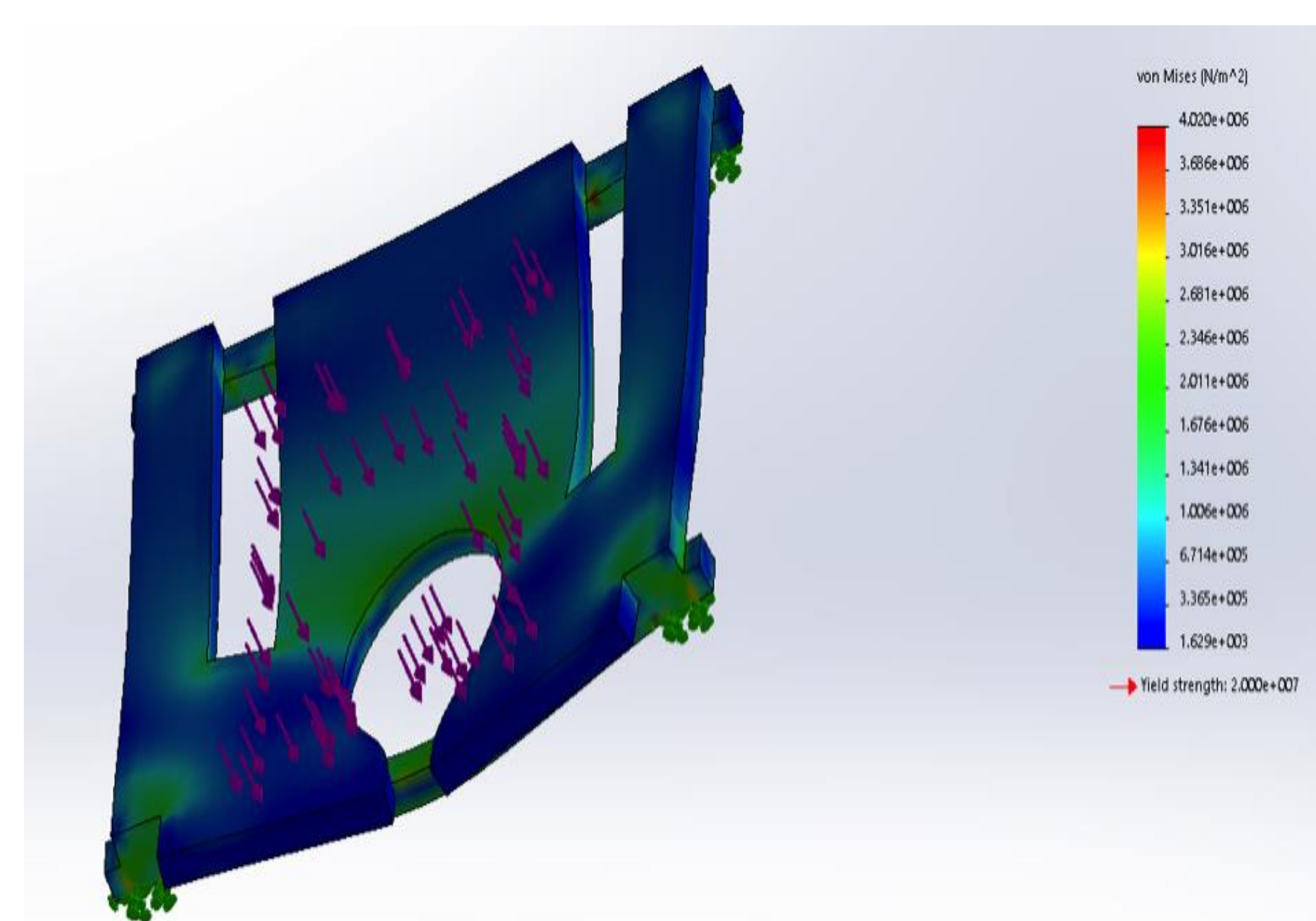
#### Functional:

- Local materials
- Local manufacturing processes
- Costs \$5 or less
- Visually appealing
- User friendly design
- Decrease stigma of having a disability

### Current Design



### Design Analysis



Wooden Seat Stress Analysis

### Key Factors of Safety

Subsystem	Factor of Safety
➤ Wooden Seat	➤ 5
➤ Column Buckling (1 1/4")	➤ 4.9
➤ Column Buckling (1")	➤ 2

### Implementation Plan

Test	Purpose
Use walker in Tecolote Canyon	Ensure stability on uneven terrain, similar to that in Uganda
Monitor heartrate during use	Make sure that use of the walker will not significantly increase energy expenditure
Standardize manufacturing processes	Confirm that process is easily repeatable and teachable

### Partnership with ULSA

The M.O.V.E. team is planning on travelling to Uganda in June 2018. While there, they will work with carpentry students and the Uganda Landmine Survivors Association (ULSA) to conduct field tests and ensure the sustainability of the project.

### Project Roles



- Kathryn Forsythe- Team Leader
- Melanie Kliegel- Chief Editor
- Davis Giles- Wheel Attachment subsystem Designer
- Taylor Bongiovanni- Frame subsystem Designer

### Acknowledgements

- Thank you to Dr. Mikaya Lumori for sharing advice and encouragement.
- Margaret Oreh and the Uganda Landmine Survivors Association for information regarding materials, manufacturing processes, and a platform for distribution of devices in Uganda.
- USD Associated Students for financial assistance.
- Our generous donors and supporters.

Sources:

- (1) "Countries Affected by Landmines - World Landmines 2009." Google Sites, sites.google.com/site/worldlandmines2009/countries-affected-by-landmines-1.
- (2) "Infographic: What's a Toilet Worth?" World Bank, www.worldbank.org/en/news/feature/2013/08/30/whats-a-toilet-worth-infographic.