

TRANSFORMABLE WHEELCHAIR

PURPOSE:

For wheelchair users who desire to participate in recreational activities, such as hiking and camping, an additional wheelchair specialized for outdoor recreational use is necessary. A secondary wheelchair is often expensive and difficult to transport. Thus, the need arose to design a wheelchair for both every day and recreational use. Design requirements were outlined by the Assistive Technology Laboratory (ATL) and Center for Persons with Disabilities (CPD) for a lightweight transformable wheelchair. The scope of the design is for users who are 12 to 30 years of age, a maximum weight of 250 lb., having reasonable upper body and head control, with the use of both hands.

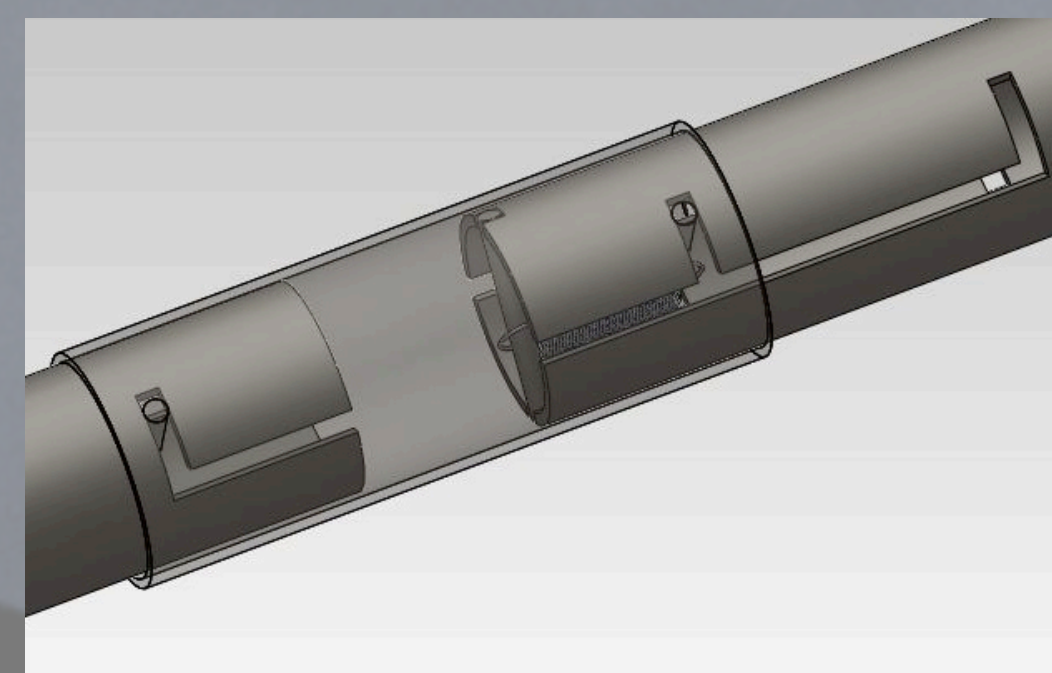
REQUIREMENTS:

1. Built under \$1500
2. Parking Brake
3. Safety Harness
4. Collapsible
5. Max wheelchair weight of 75 lbs
6. Occupant weight 250 lbs
7. Capable of traveling on a simple hiking trail
8. Can be pushed, pulled, and self-propelled

GOALS:

1. Wheelchair weight \leq 50 lbs
2. Padding handle bars with foam grip tape
3. Suspension
4. Braking system
5. Lap belt with optional 4 point harness
6. Daisy chain wheelchairs
7. Including an accessory port
8. Powder coat finished product

DESIGN:



FEATURES:

- Shocks
- Rim brakes
- Telescoping rickshaw
- Swiveling armrests/
- Locking center handles
- Compartmentalized air cushion
- Folding frame
- Neoprene harness
- Puncture resistant tires

TEST RESULTS:

Requirement		Date Tested	Results	Completed By
Static Stability	Forward	3/22/2012	37.5 degrees	CJ
	Backward	3/22/2012	40 degrees	CJ
	Sideways	3/22/2012	34 degrees	CJ
Brake Effectiveness	Parking Brake Force	4/5/2012	R-20 lb L-25 lbs	BD
	Operating Force	4/5/2012	R-19 lbs L-25 lbs	BD
Transformability	Into Rickshaw	3/22/2012	1:03/1:02/1:00 Average 1:02	BS
	Out of Rickshaw	3/22/2012	1:16/:51/1:22 Average 1:10	RL
Transportability	Opening	3/22/2012	7.8 s/ 8.3 s Average 8 s	MS
	Closing	3/22/2012	9.6 s/ 8.9 s Average 9.25 s	MS
Working Shocks	Drop Test	3/22/2012	270 lbs. off 14" didn't bottom out; desirable response; flanges bent	BD
Size: Comfort - Which is more comfortable?	Place in Trunk	3/22/2012	Fits in Berk's car (14.1 cubic feet)	BD
	Sidewalk	3/22/2012	Comparable	CJ
	Pavement	3/22/2012	Autobots	CJ
	Off road	3/22/2012	Autobots	CJ
	Final Cost <\$1500	3/22/2012	\$1228.16	MS
	Weight <75 lbs.	3/22/2012	50.6 lbs	RL

SPECIFICATIONS:

Seating Dimensions	18x16"
Wheel Dimensions	24x1 3/8"
Folded Dimensions	45x37x12"
Extended Rickshaw Length	67"
Shocks	Spring with oil damping
Braking	Locking Rim
Material	Chromoly
Total Weight	50.6 lbs
Total Cost	\$1228.16



Designed & Created by:

TEAM AUTOBOTS



From left to right:
Ben Shurtz, Berk Demirgok, Curtis Johnston,
Ryan Lindsley, Marissa Sabillon

