

## Client:

Our client is an elementary school wheelchair user who needs assistance when using the restroom.

## Problem:

Our client's caretakers have difficulty transferring her from her wheelchair to the toilet, a physically demanding process that currently takes 15-20 minutes.

## Design Goals:

- Decrease physical demand on caregivers
- Have little impact on normal restroom usage
- Be compact enough to fit in bathroom
- Allow for undressing and cleaning of client
- Create a comfortable, sturdy device
- Provide a safe, reliable, and robust device
- Provide adequate support at all times
- Require minimal support from a single caregiver

## Constraints:

- Ease of use
- Cost
- Hygiene
- Size of Bathroom
- Future User Adaptability
- Transfer Time

# Wheelchair-To-Toilet Transfer System

## Team Optimus

Tulane University  
Dept. of Biomedical Engineering  
Lindy Boggs Suite 500  
New Orleans, LA 70118

For Information Contact:  
Team\_Op@yahoogroups.com



**Brooks D. Fowler**  
**Jacques P. Levet, Jr.**  
**Nicolle C. Perez**  
**Ashlee L. Riden**

## Design Solution

- Wall-mounted steel track spanning entire width of restroom
- Low-resistance trolley with magnetic brake
- Mechanical pulley rated at 1000 lbs.
- Hoyer cradle and sling designed for 400 lbs.



## Operating Procedure

1. Position client and wheelchair next to the toilet and below the hoist.
2. Lower the cradle to allow the caregiver to position the client in the harness.
3. Raise the client to clear any obstacles.
4. Roll the trolley along the beam to position the client above the toilet.
5. Lower the client onto the toilet.
6. Raise the client and return her to the wheelchair

## Safety & Cost

- Weakest link: Cradle at 400lb capacity
  - Statics and mechanics calculations show system can support weight of our client
  - Cradle padding
  - Magnetic break
  - Rubber stops on track to keep trolley from running into the wall
  - Easily detachable components to ensure the device is not operated without proper supervision
- ~
- Similar commercial lifts start at \$2,500 while ours is around \$700
  - Can be made with off-the-shelf parts
  - Can be modified to be wall-mounted or free-standing
  - Can be used by a variety of clients