

Modular Wheelchair Ramp

Team Froggy Bottom



The Problem

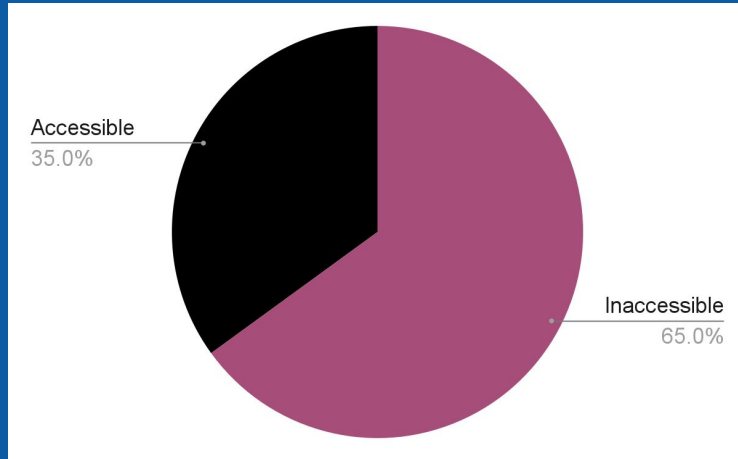
Public infrastructure remains
inaccessible

The Target Population

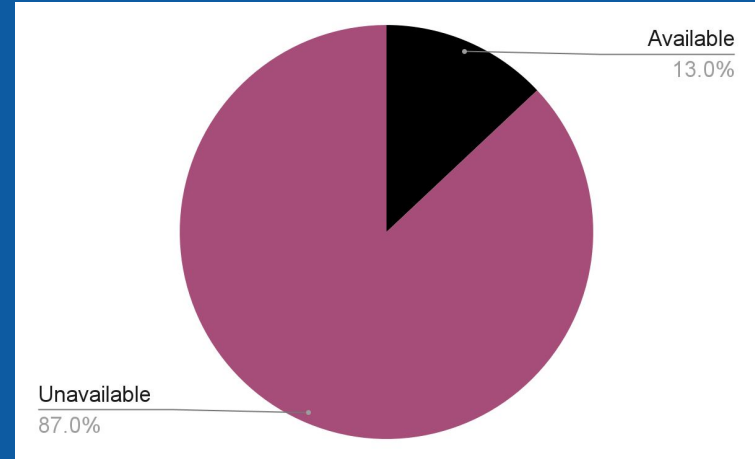
Persons with mobility issues continue to
face accessibility issues



Persistent Inequality



**Proportion of Curbs Inaccessible
(Eisenberg et al., 2020)**



**ADA Transition Plans Readily Available
with government agencies
(Eisenberg et al., 2020)**

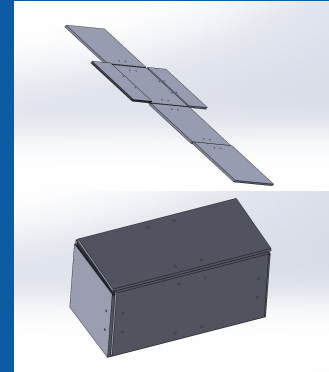
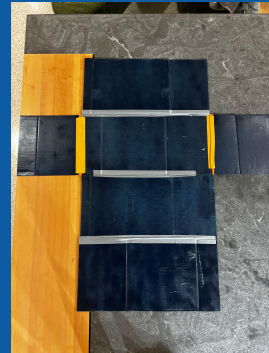
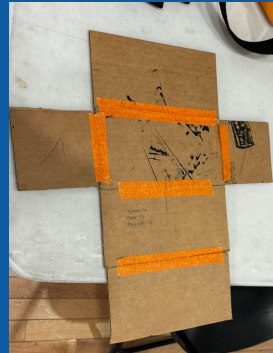
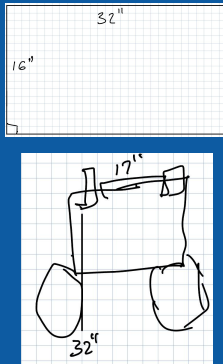
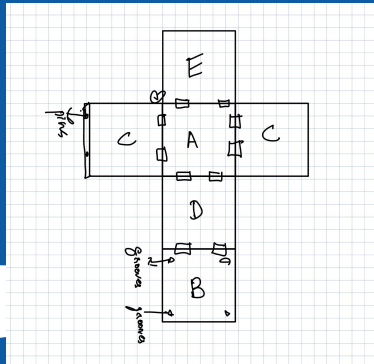
The Solution: Idea

- Ever changing, dynamic environment
- According to CNBC, disabled Americans are twice as likely to be in poverty
- These ramps should be easy to assemble, take apart, store, and transport.
- The goal: creating an affordable ramp and modular device to increase wheelchair users' mobility.
 - Buckle rather than pocket, ideas for a rope pulley

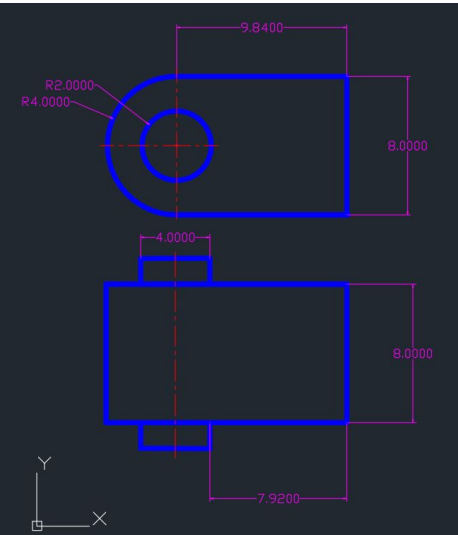
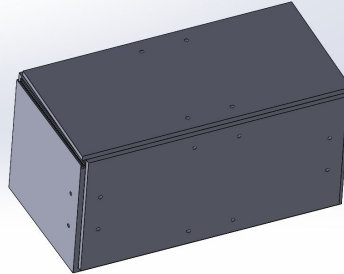
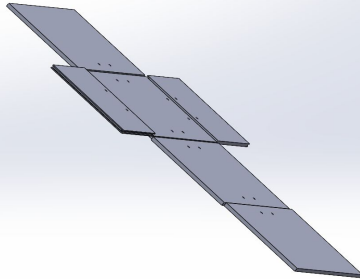
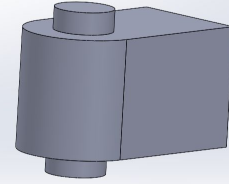
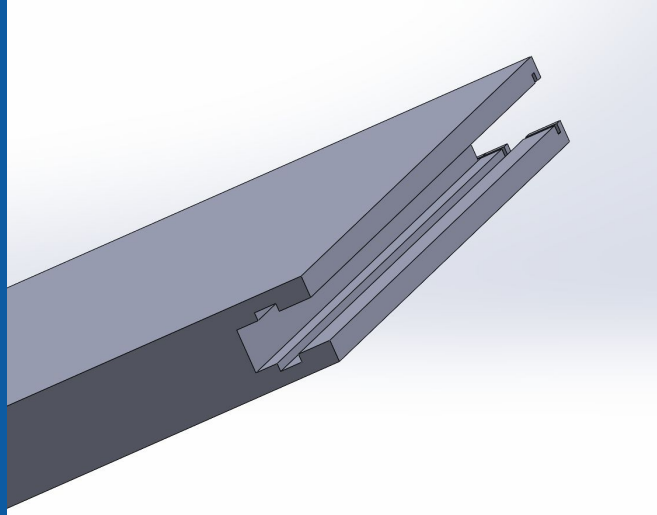
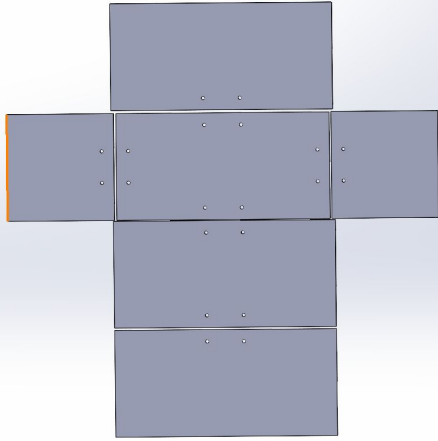


The Solution: Prototyping Process

- Sketches and Drawn Models
- Cardboard (4:1)
- Cardboard (full size)
- Buckle with strap
- CAD (3D modeling)
- 3D Printing (scaled by $\frac{1}{4}$ with details and hinges, errors with equipment)
- Researching materials in order to accommodate weight-bearing and weight

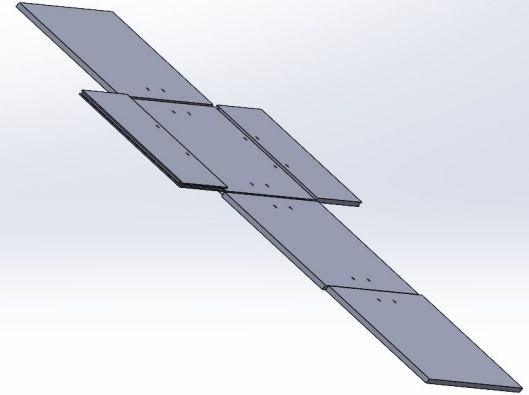
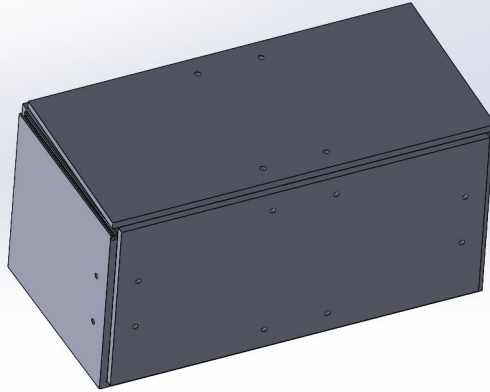
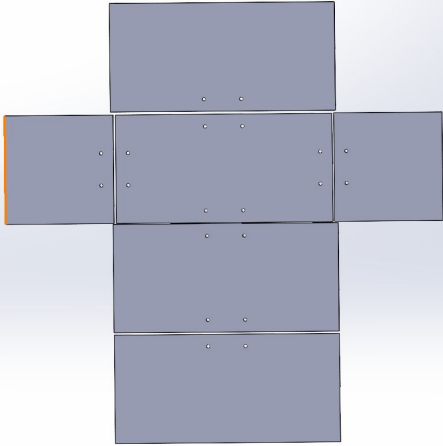


The Solution: Using CAD

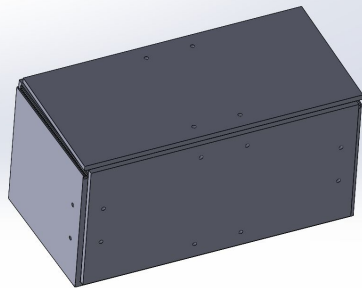
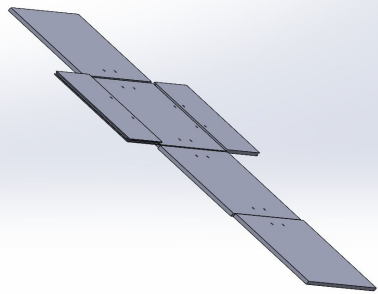


The Solution: Use Cases

1. Mat used in public spaces
2. Box used as seating
3. Ramp



Our Ramp vs. Competitors'



The Process of Production



- Estimated production cost: <80 dollars
- Environmentally conscious design
- We chose HDPE because it is
 - strong
 - cheap
 - less environmentally destructive
 - easy to clean
- Weight bearing: ~ 1000lbs



Thank You For Listening

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