

Deliverable D – Inclusive Bike Prototyping

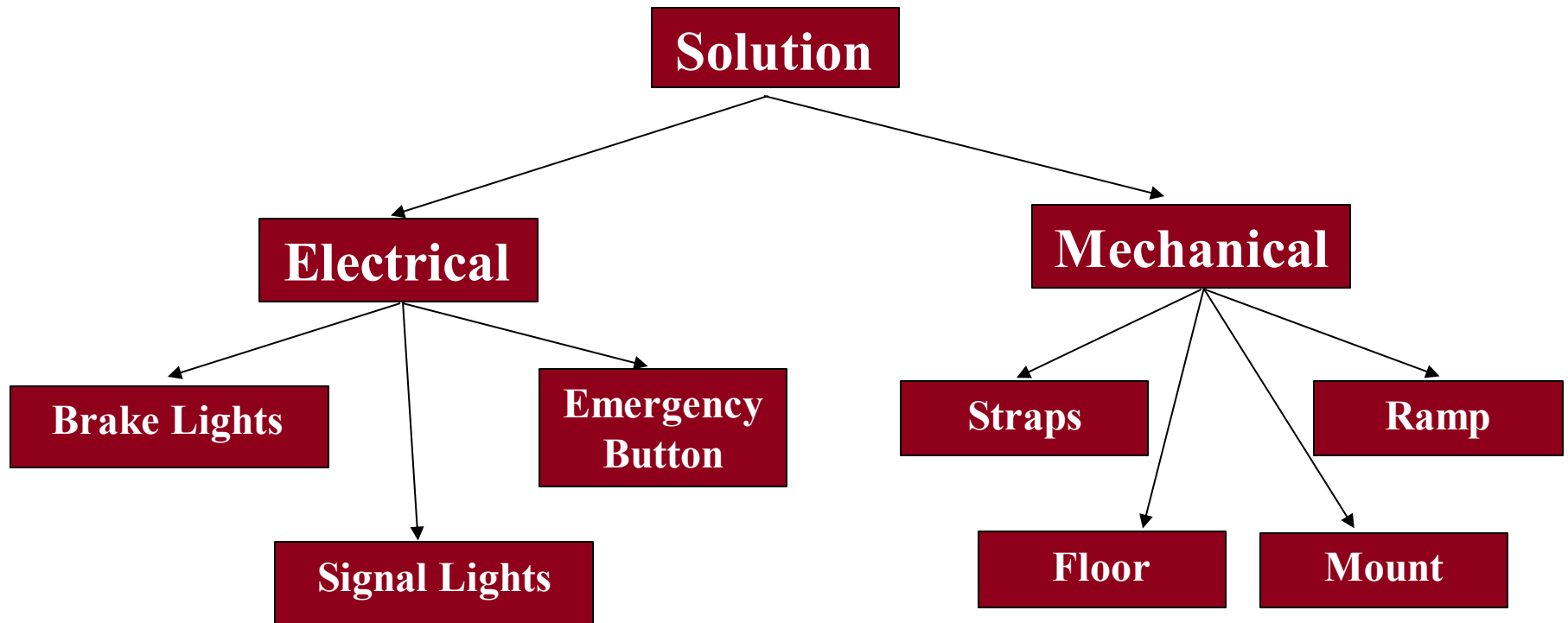
Initial Prototype Description and Summary of Key Product Features

Presented by Jonathan Horton

Our Team

- **Jonathan Horton (Presenter)**
- Sachin Kasbekar
- Gaurang Lele
- Kristina Prasad
- Raghav Kaushik Vagata Umesh

Global Solution – Conceptual



Global Solution – Key Features

- **Mechanical Features:**

- Hold the wheelchair **securely** to the floor
- The ramp needs to hold the weight of the user **without flexing disconcertingly** (up to 150kg)
- A ramp that allows the user to get **on and off** the trailer without being overly cumbersome to use
- A mounting system to **link** the trailer and the bike

- **Electrical Features:**

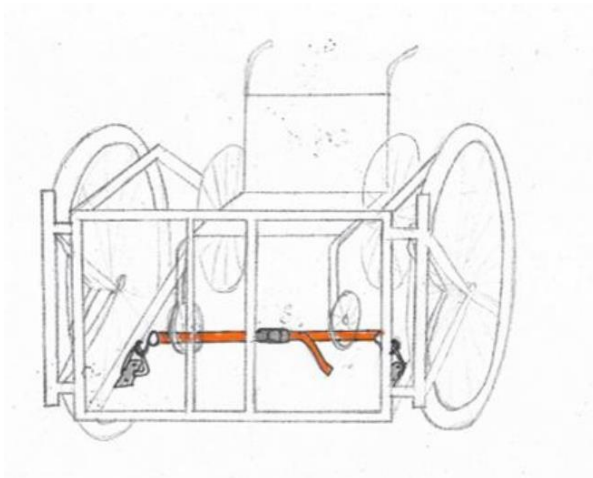
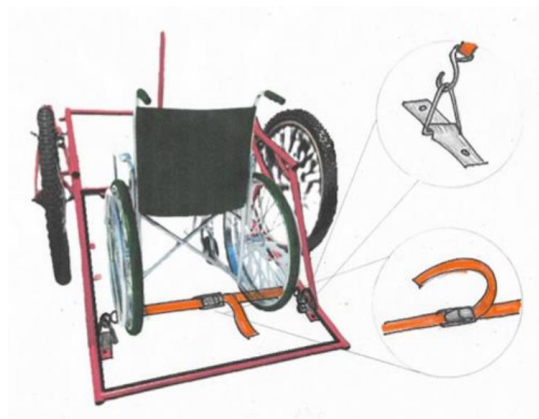
- Brake light when the driver activates the **braking** mechanism of the bike
- **Blinking** signal lights for when the driver wants to turn
- An emergency button easily accessible by the passenger to call local **emergency services**

Prototype & Test – Mechanical - Goals

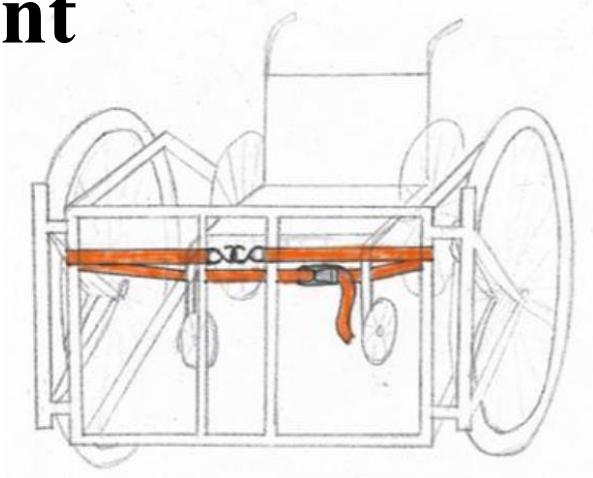
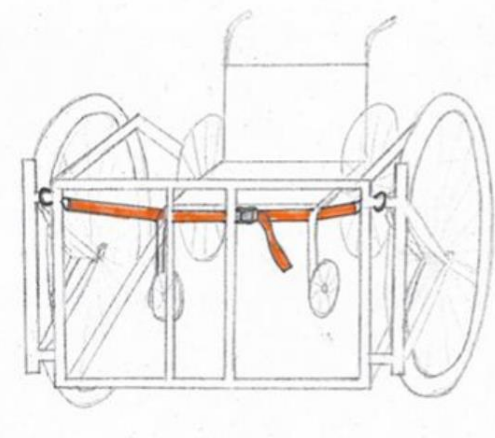
- **Straps**
 - Finalize decision on which straps to purchase
- **Ramp**
 - Complete the digital design of the ramp in Solidworks
- **Floor**
 - Complete the digital design of the floor
- **Mount**
 - Complete the digital design of the mounting system

Prototype & Test – Mech. – Strap Visuals

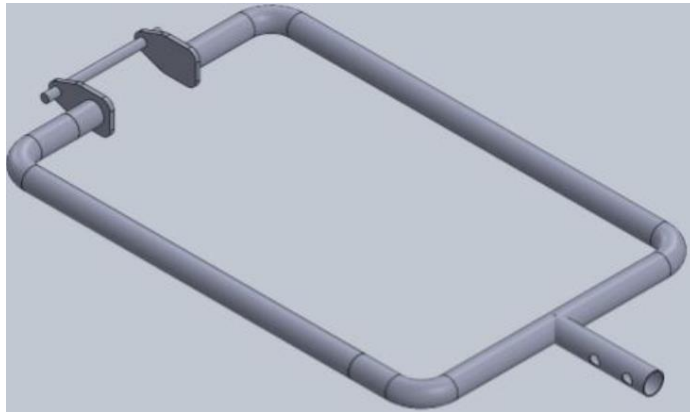
Rear



Front



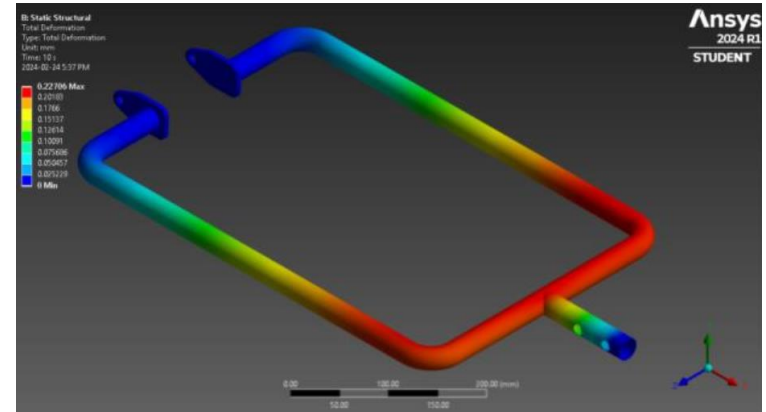
Prototype & Test – Mech. – Mount



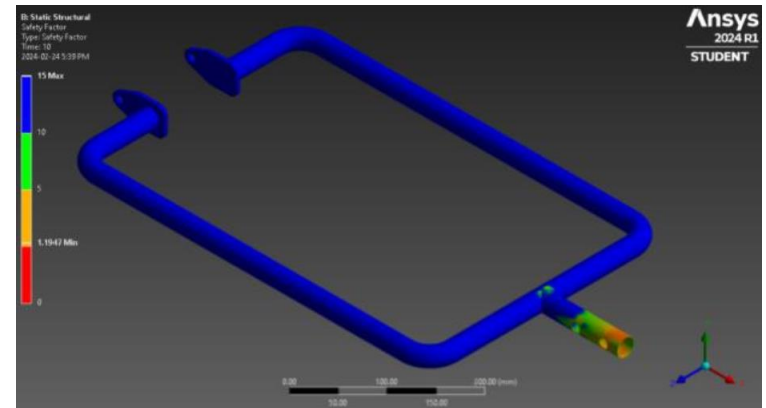
Isometric View



Side Views

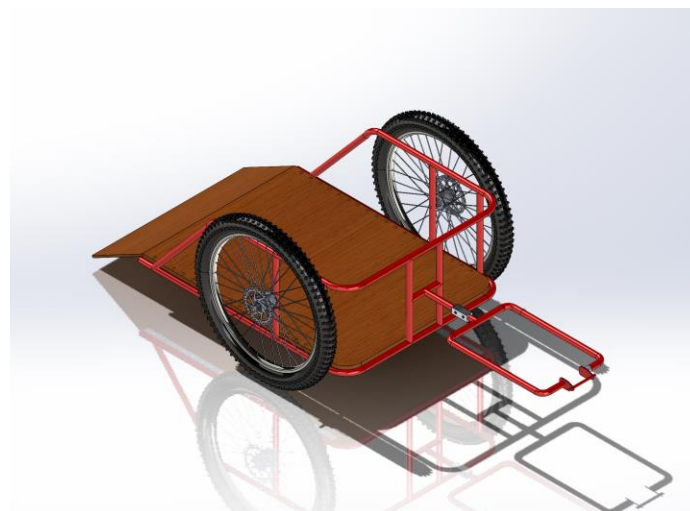
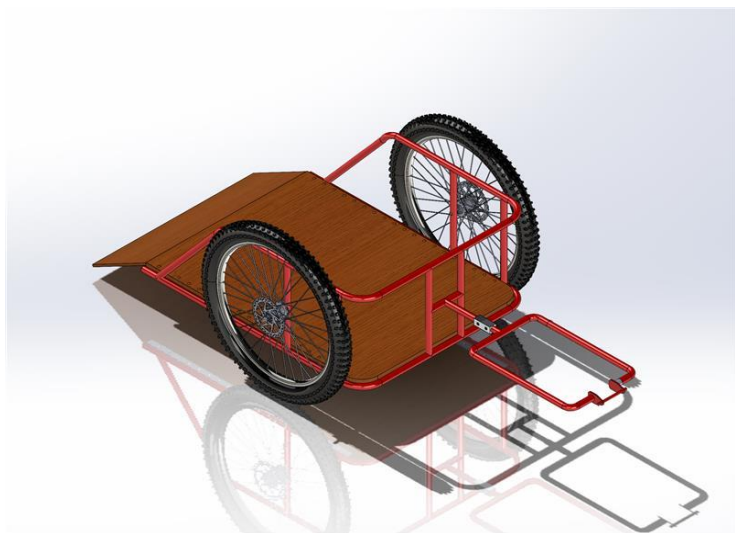


Total Deformation



Factor of Safety

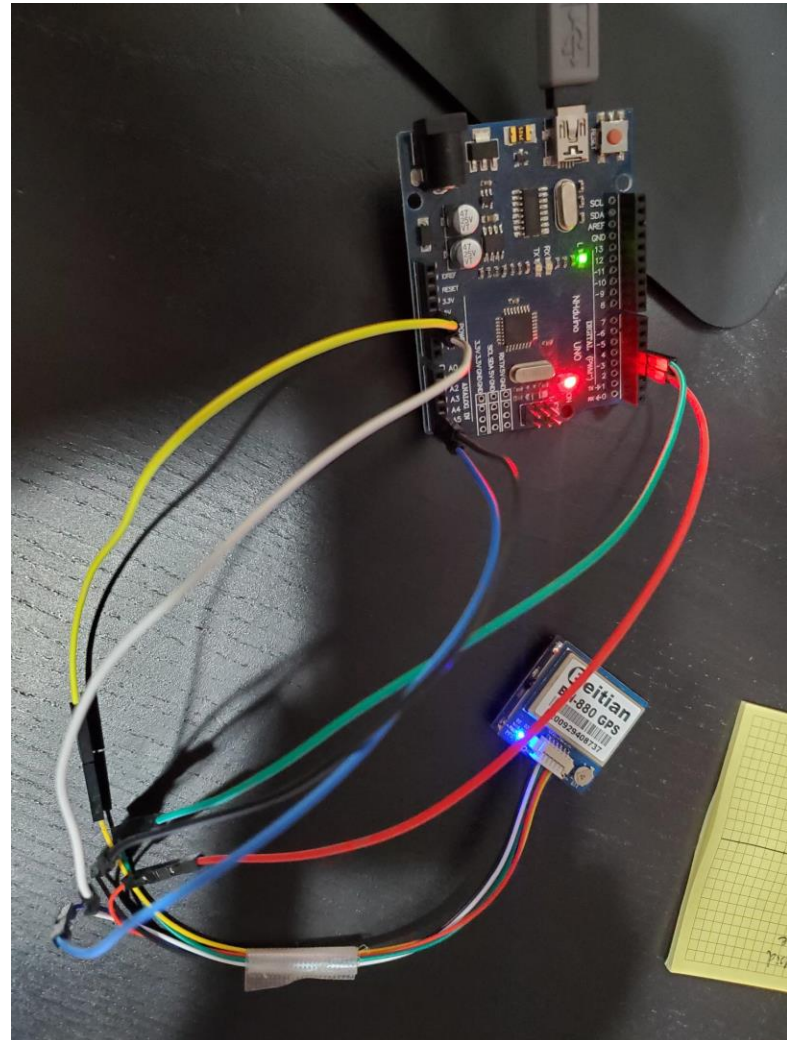
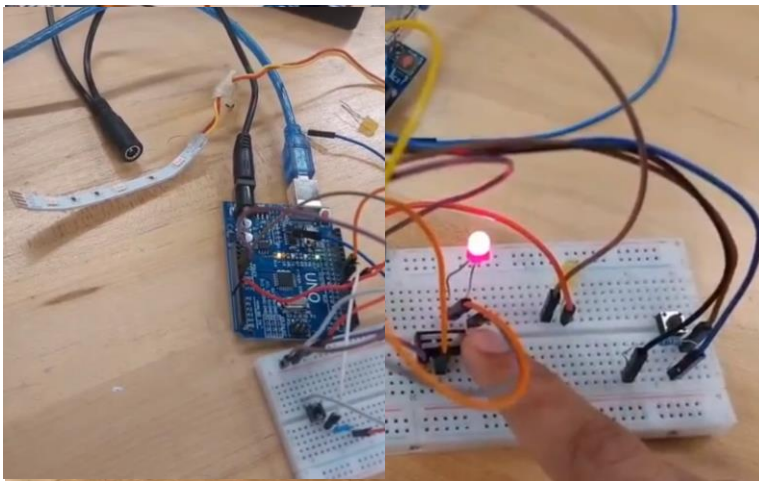
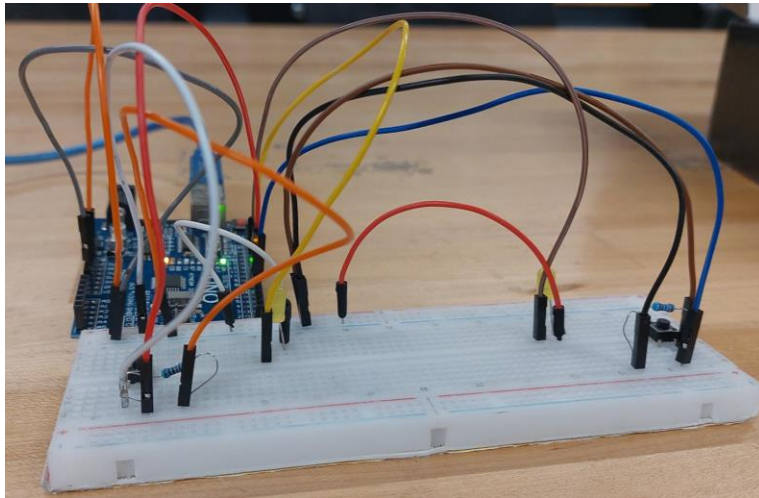
Prototype & Test – Mech. – Ramp and Floor



Prototype & Test - Electrical

- ***Brake Lights***
 - We intend to complete the design using light strips instead of LEDs
- ***Signal Lights***
 - As above, we want to redo the design with light strips
- ***Emergency Button***
 - While the GPS is working, the emergency button needs to be implemented with a Bluetooth module, which will be completed for the next deliverable
 - It would be ideal to use a GSM module, but it's **too expensive** to buy module & cellular access for this class.

Prototype & Test – Elec. – GPS & Lights



Progress on Project Plan

- We have located a potential vendor for the expanded metal sheet that we intend to use as the **floor** of the trailer
- We have successfully prototyped the **GPS system**, **brake** lights, and the **signal** lights
- We have the **initial design of the floor and ramp** completed
- We have considered many different straps and ways of **anchoring** the wheelchair to the trailer.
- We continue to update the Gantt chart, tasks and **critical path** as necessary

Thank You! Questions?