Deliverable E – Inclusive Bike Prototyping

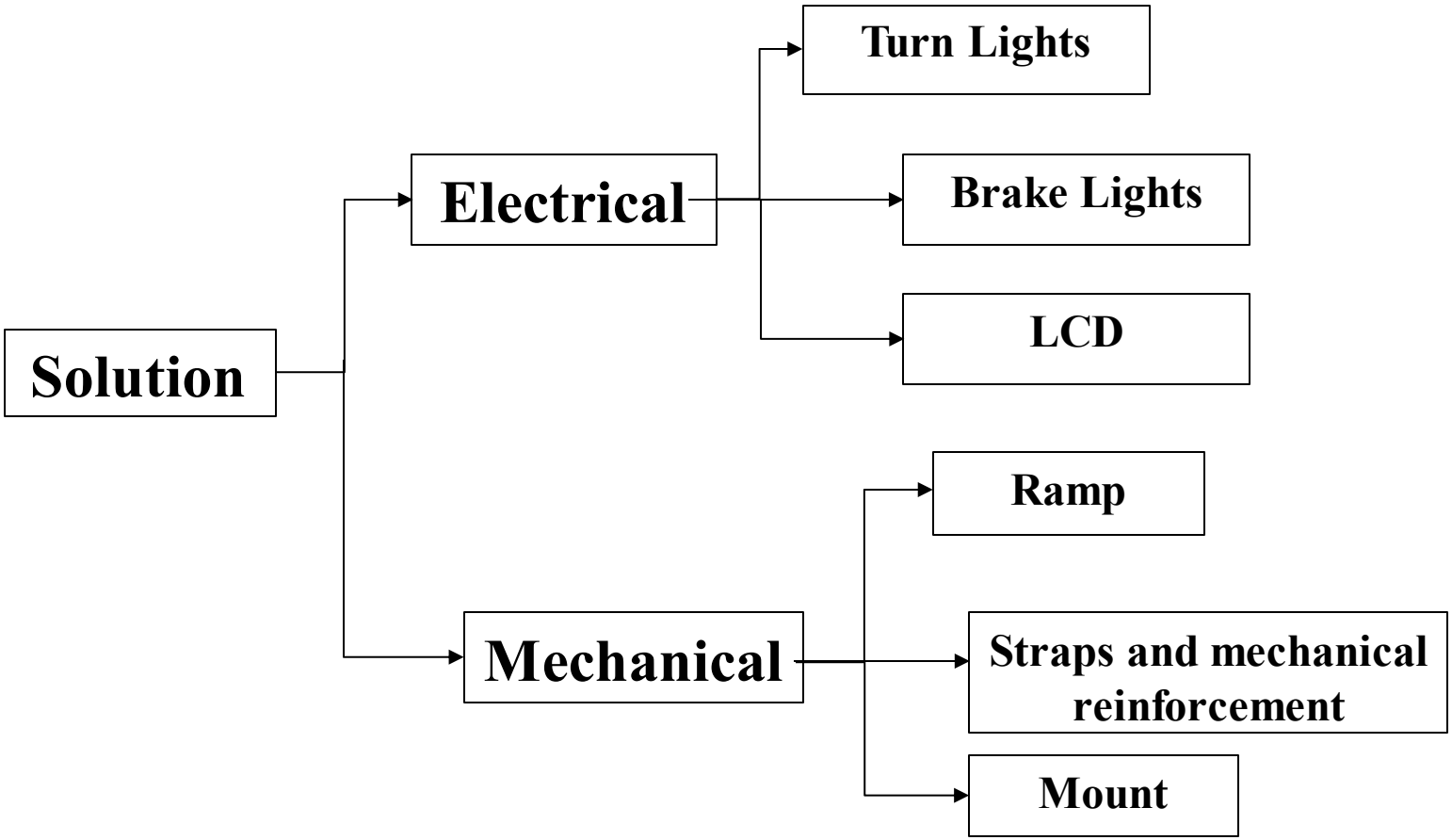
Reversed Prototype description and summary of significant changes

Presented by Raghav Kaushik

Our Team

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

Global Solution – Conceptual



Global Solution – Key Features

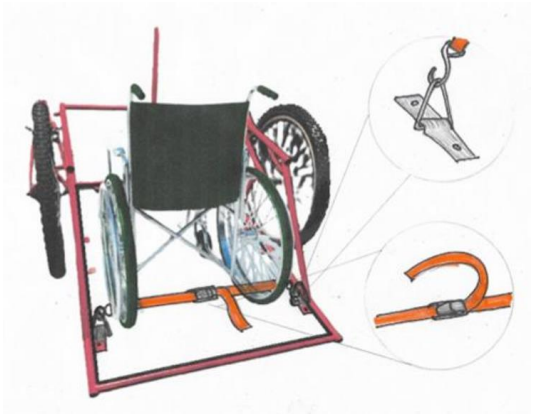
- **Mechanical Features:**
  - Hold the wheelchair **securely** on the floor
  - The ramp needs to hold the weight of the user **without bending too much** (up to 150kg)
  - A ramp that allows the user to get **on and off** the trailer easily
  - A mounting system to **link** the trailer and the bike
- **Electrical Features:**
  - **Brake** light when the driver activates the **braking** mechanism of the bike
  - **Turn** lights for when the rider desires to take a turn
  - **LCD** for communication between the driver and rider

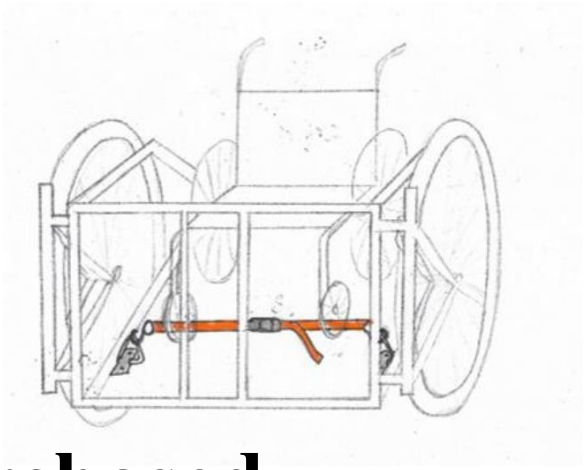
Prototype & Test – Mechanical - Goals

- **Straps**
  - Final placement of straps on the cart to secure the wheelchair.
- **Ramp**
  - Fabrication and ramp assembly using the birch wood.
- **Floor**
  - Building the floor using the birch wood we got.
- **Mount**
  - Complete the design of the mounting system components and final assembly. Usage of mild steel for the mounts.

Prototype & Test – Mech. – Strap Visuals

Rear

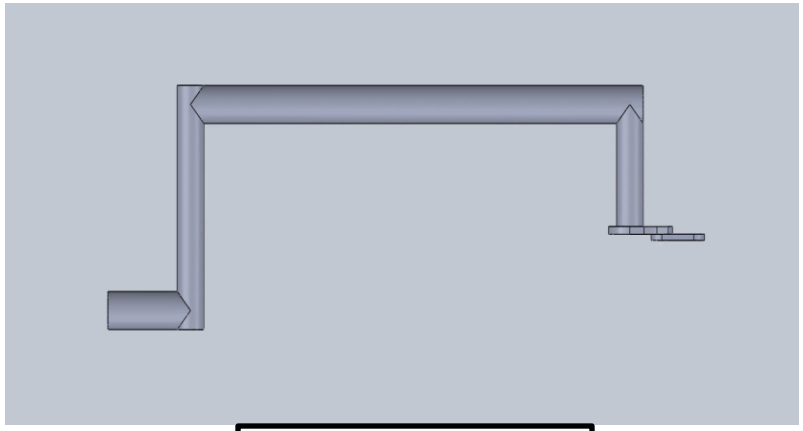




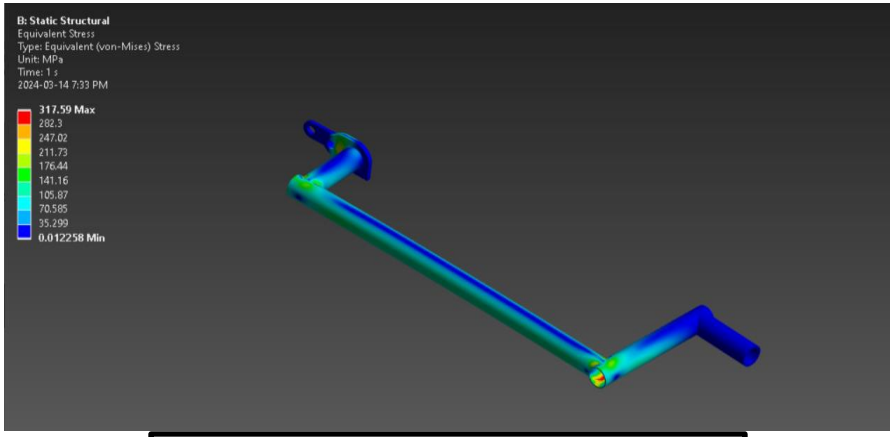
Purchased

Prototype & Test – Mech. – Mount

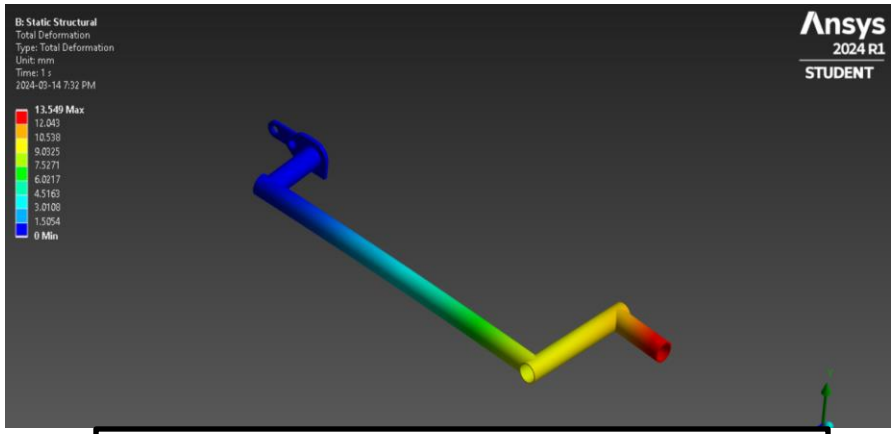
ISOMETRIC VIEW



TOP VIEW

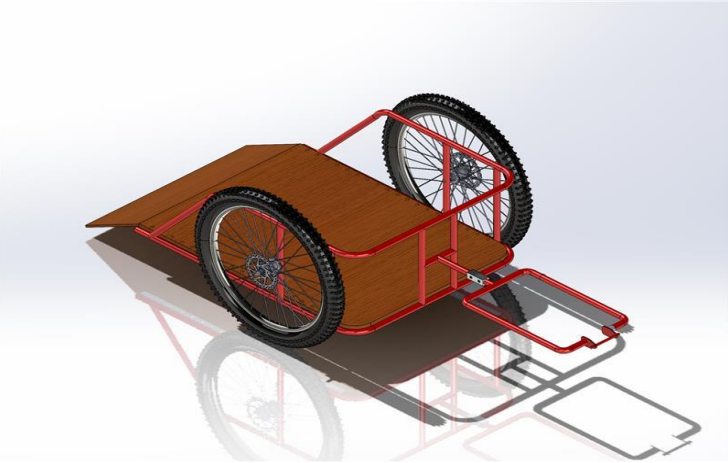


STRESS ANALYSIS



METAL DEFORMATION

Prototype & Test – Mech. – Ramp and Floor



Prototype & Test - Electrical

- **Safety-**

1. Brake Lights-

We intend to integrate all the components on the breadboard and then move on to the PCB for the final placement.

2. Turn lights-

Integrate all the components on the breadboard where we have used LED strips similar to indicators and then move everything onto the PCB for final placement.

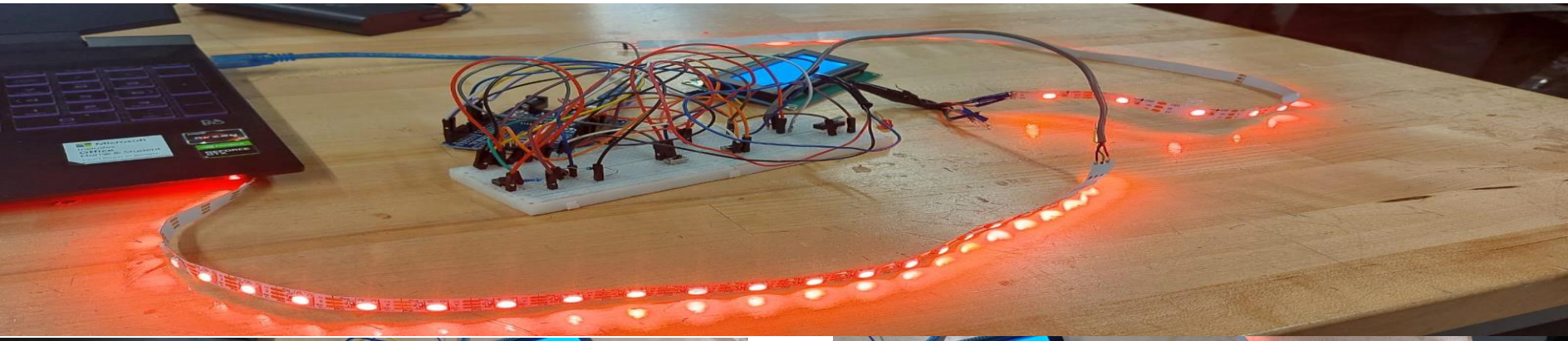
- **Communication-**

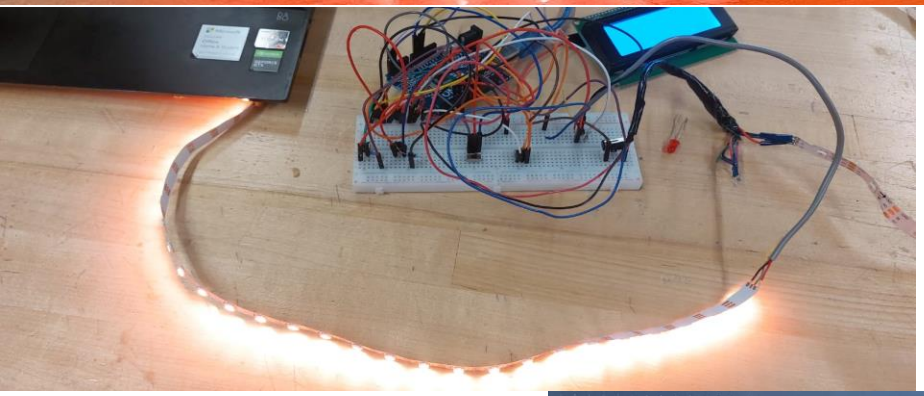
1. LCD-

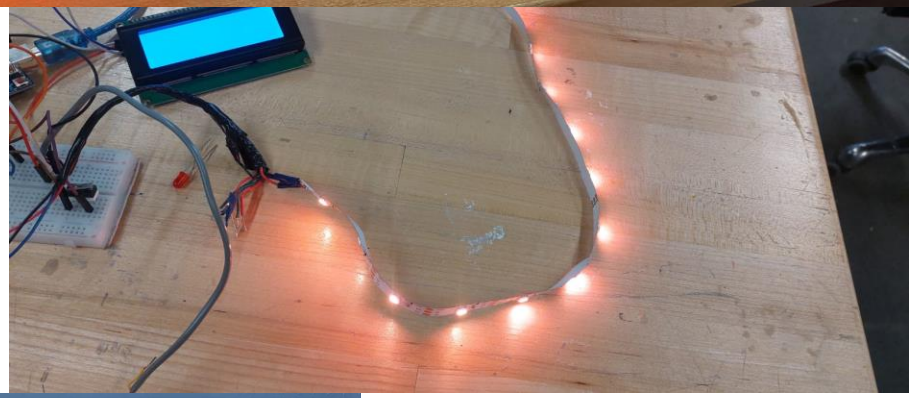
Integrate LCD with the safety system onto the breadboard and intend to use a buzzer for an alert system. Do the final testing for the communication system and move on to the assembly of the bike.

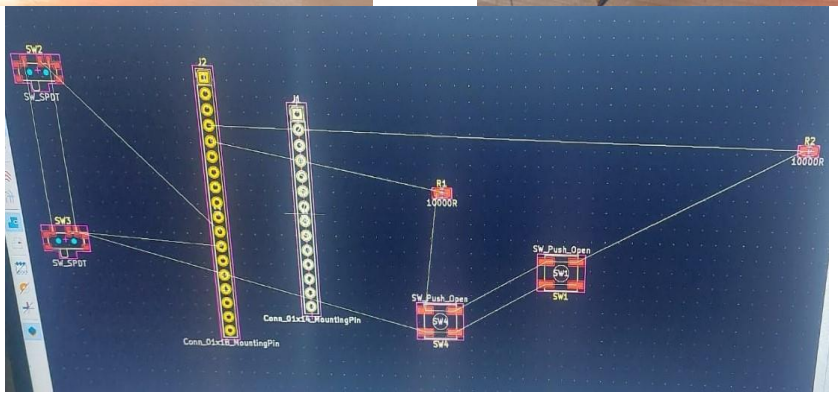
- PCB- Working on the PCB design for the control circuit.

Prototype & Test – Electrical Safety System









Prototype & Test – Electrical COM System

Progress on Project Plan

- Found a dealer ready to sell the metal pipes for a good price and planned to purchase it over the weekend.
- We have successfully prototyped the **brake** lights, **signal** lights, and LCD using the desired components on a breadboard together.
- We have secured the birch wood desired for the floor and ramp.
- We have bought good quality straps of high safety standards.
- We continue to update the Gantt chart, tasks, and **critical path** as necessary

Thank You! Questions?