**Team: P21462 Engineer: Matthew Madsen**

**What were the outcomes of the prior phase?**

1. What did I plan to do?
   1. Once our design is finalized, I will do a vibratory analysis of our collapsed cart to see if our design will hold up in flight and in transit in a car. This will be simulated. It will take me probably 5hrs or so. This can be down after all pieces are together. This can be done by 11/1.
   2. I will design some component in solidworks to help garret. I will probably do an easier piece such as the legs. This will take 2-3hrs and can be done by 10/18.
   3. I will include other renewable energy sources to the battery charge spreadsheet. This will take 3-4hrs and can be done by 10/18.
   4. I will help Garrett design the stopper which will hold our cart to a certain height. This will take 2hrs and can be done by 10/11.
   5. I can help Garrett figure out how to motorize our system to make it fully automated to collapse/uncollapse the system. This will take 1-2hrs and can be done by 10/11.
   6. I can put the motorization of the cart into the spreadsheet simulation. This will take 30 minutes and can be done by like 10/15.
2. What did I actually do?

I did structural analysis of the cart solar panels, bolts and pin sizes, and top and bottom table thickness. These analyses could not be necessarily foreseen and were ideas that we got during prototyping. I did have the cad the parts to do the analyses. We learned that combining power sources was not possible so we did not need to add that aspect to the spreadsheet. We also decided that the cart will just be raised by hand and the motor components don’t need to be added. I set up the vibratory analysis and now that I have the full cad model and a full account I can actually start that. Garrett and myself did figure out what could be used as a stopper for the cart.

1. What did I learn? How were plan and reality different?

I planned to do a lot more with the renewable energy sources but we ended up having to scrap that and I instead did mainly structural analysis of the cart. Most of the plans changed as we learned more as described above. Our project had a large change in what we thought it was going be when we found out that multiple sources were not possible. I learned that the process can change quickly and we need to change with it.

**Team level goal for next phase**

In the next phase we will perform more feasibility work as our design becomes more detailed. After our concepts are confirmed or adjusted based on the feasibility information, we will begin validating our models/designs. While we are adding detail to our design, we will modify our bill of materials to make the design cheaper and lighter. As a result of our feasibility work, we will further develop test plans for the full-scale parts of our design as we further develop the systems themselves. Finally, once the new information is generated, we will compare it to the work from the previous phases and make sure that our direction as a team is aligned with what our information shows.

**What do I plan on doing to ensure that my team has a successful review at the end of the next phase?**

1. **I will run a vibratory analysis of the cart to determine if our cart will be safe during transit in car and plane via Ansys. This can be finished by 11/14 and will take 3 or so hours. I need the full version of Ansys as my student version is not powerful enough so I’ll have to go in that day.**
2. **I can validate the table top bending. We can take sheet metal and put a known weight on it to measure deflection. This can also be done on 11/14 or 11/16 and will take an hour or so.**
3. **We can update the previous teams test plans for the cart. This will take an hour to so and can be done by 11/1.**
4. **We need to create documentation fully describing the test plans and further describing the simulations. This will take an hour or two and can be done by 11/1.**
5. **We can validate the pin sizing calculations. We can add weight to screws and look for weight that can be held. This will take an hour to complete and can can also be done on 11/16.**

**What is standing in my way of meeting my next phase goals?**

Nothing