# Solar Assist Trike

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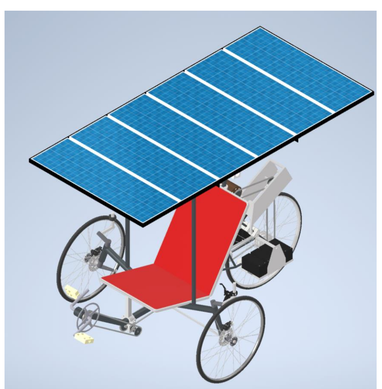
## Design Specifications:

- Trike to be classified as a Neighborhood Electric Vehicle (N.E.V.)
- Electric Motor to be supplied power via onboard batteries charged by Solar Pannel Canopy
- Designed specifically to accommodate the 95th percentile of the population
- Must incorporate Ackermann steering for increased maneuverability and safety

## CAD Prototype:

After analyzing the prototype of the trike in Autodesk Inventor, we were able to test and improve some of the fabricated parts and assembly methods for the manufacturing portion of the project.



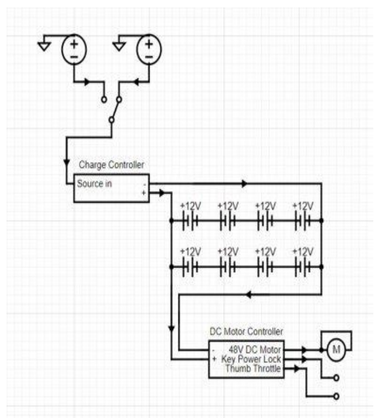
## Abstract:

The Solar Assist Trike Design Project was started to satisfy the needs of a pollution-free, on-the-go charging form of transportation. With the use of a solar panel to charge several batteries that power a motor, the idea is that the rider will only need to pedal at a steady, comfortable pace while still maintaining speeds above 10 mph. After finalizing our deign, we were able to bring into fruition a working protype which we believe successfully fulfills the goals of this design project.

## Final Product:

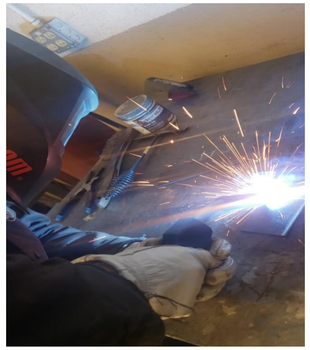
## Electronics & Controls:

- Full 48-volt DC circuit
- Load controller to protect batteries from over charging or over discharging
- Both solar panels and batteries are configured in series-parallel to maximize amperage while maintaining 40-volts
- Motor control box for variable motor speeds and power locking
- Secondary charging method for unfavorable solar charging conditions




## Manufacturing Processes:

Throughout the manufacturing processes we used a vast array of machinery and fabrication methods to create the parts needed. Machines like the Mill, Lathe, Drill Press, and Plasma Cutter were essential in the Fabrication process. In order to bring the assembly all together we frequently opted to weld the steel parts together for maximum durability.



## Results:

Our final product satisfied all the design specifications as we incorporated Ackerman steering, an electric assist feature, multiple different battery charging methods, reached speeds of over 20 mph, accommodated for all riders , and provided a smooth and enjoyable experience for the rider. The internal gear hub laced into the rear tire eliminated the common issue of chain jumping caused by a derailleur. Going forward we could improve on the design by reducing overall weight and implementing higher performing electronics.