Overview
The team was tasked with reducing frictional losses in the existing Eco-marathon urban concept vehicle. The team elected to build spoked wheels to reduce the weight of the existing motorcycle wheels. Additionally, the team eliminated the existing brushed motor and gearbox in favour of a brushless DC hub motor integrated into the wheel.

Objectives
The overall objective was to increase the equivalent gas mileage of the urban concept vehicle. This was accomplished by reducing frictional losses and lightening the car.

Approach
- The team elected to reduce frictional losses and lighten the urban concept vehicle
- A brushless DC hub motor was selected to replace the heavy brushed DC motor and gearbox
- The team designed custom hubs for the remaining three wheels using DS Solidworks
- The custom hubs were used to create spoked wheels
- The spoked wheels were derived from a “Stingray Chopper” rim
- A DS Solidworks model of the final wheel design was used to help calculate spoke lengths
- The current braking system was thoroughly bleed and reassembled to reduce brake rub
- The final design incorporates the lightweight wheels, hub motor, and solar panels.

Outcomes
Finally, list the outcomes for this project making sure to clearly convey their implications for the sponsoring company:
- The UCV will get approximately 5000 mpg equivalent based upon calculations and estimates.
- The weight was reduced by approximately 84 pounds.
- The vehicle can travel farther due to the elimination of frictional losses.
- The brushless hub motor provides better efficiency for the vehicle.