Shell 2- Shell Eco-Marathon

Overview
The Penn State Diesel Team has the objective to redesign the power train for the urban concept vehicle created last year. The previous power train functioned but was direct drive thus inefficient during start from rest and cruising speed. The goal was to determine what problems needed to be fixed and to solve the problem to obtain a better fuel efficiency than the previous design achieved.

Objectives
There are three main assemblies that the team needed to address for the manufacturing process plan including the gear box, drive shaft and the door.

Approach
- Customer needs were gathered and analysed using an AHP table.
- Several concepts were generated: Custom gearbox, CVT, motorcycle transmission
- Gear ratios were compared for optimization using a comparison chart. Shaft design was also completed.
- Models were created on Solid Works
- A prototype was created in the learning factory
- Testing was performed to ensure that all of the parts functioned as intended
- The vehicle competed in the Shell Eco-marathon in Houston Texas
- 153 Mpg was achieved.

Outcomes
- The project came in under budget
- Manufacturing saw many delays because of part lead time
- The project saw an increase in the official fuel economy at the Shell Eco-marathon from 142 to 153 mpg.