**BASIC UTILITY VEHICLE FOR SUB-SAHARAN AFRICA**

Our vision is to use our senior design opportunity and Purdue’s resources to make a meaningful impact in the world.

**MOTIVATION**

Address transportation problems in developing countries in Sub-Saharan Africa, specifically Cameroon, by developing an affordable, easily manufactured, all-terrain vehicle.

**MISSION STATEMENT**

Redesign the BUV to use front-wheel drive transmissions to achieve rear-wheel drive, therefore securing the future viability of the project as rear-wheel drive transmissions become scarcer in Cameroon.

**FINAL DESIGN**

**PROJECT CRITERIA**

- Limited by materials and tools available in Cameroon
- Costs less than $2000.00 USD.
- Able to carry over 2000lbs at up to 20mph.
- Incorporates 5-speed plus reverse manual transmission.
- Powered by 10HP diesel engine.
- Protects engine from theft and isolates passengers from noise.
- Able to power agricultural attachments.

**FEATURES**

- 5-speed manual transmission.
- Struts on all three wheels.
- Extended shifter.
- Motorcycle-type throttle.
- Rigid link clutch.
- Jackshaft to power agricultural attachments.

**PROJECT BACKGROUND**

The Purdue Agricultural and Biological Engineering Department partners with GEP to implement BUV designs in Cameroon. Previous BUV designs have relied on scrapped rear-wheel drive transmissions to achieve rear-wheel drive. The availability of such transmissions is expected to decrease in Cameroon as most car manufacturers started shifting to front-wheel drive in the late 80’s.

**FABRICATION**

- Project built entirely using materials and tools available in Cameroon, which includes: angle iron, wood, scrapped car parts, a welder, and basic power tools.
- Completed design, analysis, fabrication, and test in one semester.

**RESEARCH & DEVELOPMENT**

- Trips to Indy Pic-a-Part and auto stores to source components.
- Iterated truss frame design based on FEA results.
- Developed CG, turning radius, braking force, and speed range analyses.
- Accommodated design to fit similar parts available.

**CASES**

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<tr>
<td>5000 lb.</td>
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