



BAJA SAE Racecar- XV 2015

Advisor: Dr. Michael McCarthy, Robert "Smitty" Smith

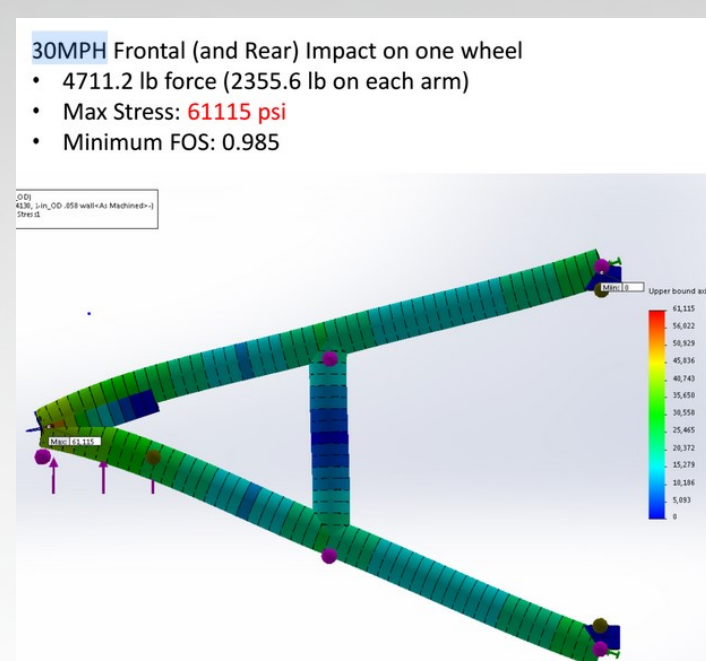


Background:

The Baja SAE Project (formally Mini Baja) is an international collegiate design competition. All Vehicles are single seat powered by a 14.5 ft/lb Briggs and Stratton Engine. UCI has not competed in 10 years.

Goal:

- ◆ Design, fabricate, test, and compete in Oregon May 27—30, 2015.



Objective:

- ◆ Create an off road vehicle that can complete all of the events
- ◆ Utilize Solidworks to design and analyze components

Force on Wheel Calculation

Impact at 30 mph on one wheel

$$30.0 \text{ mph} = 13.4 \text{ m/s}$$

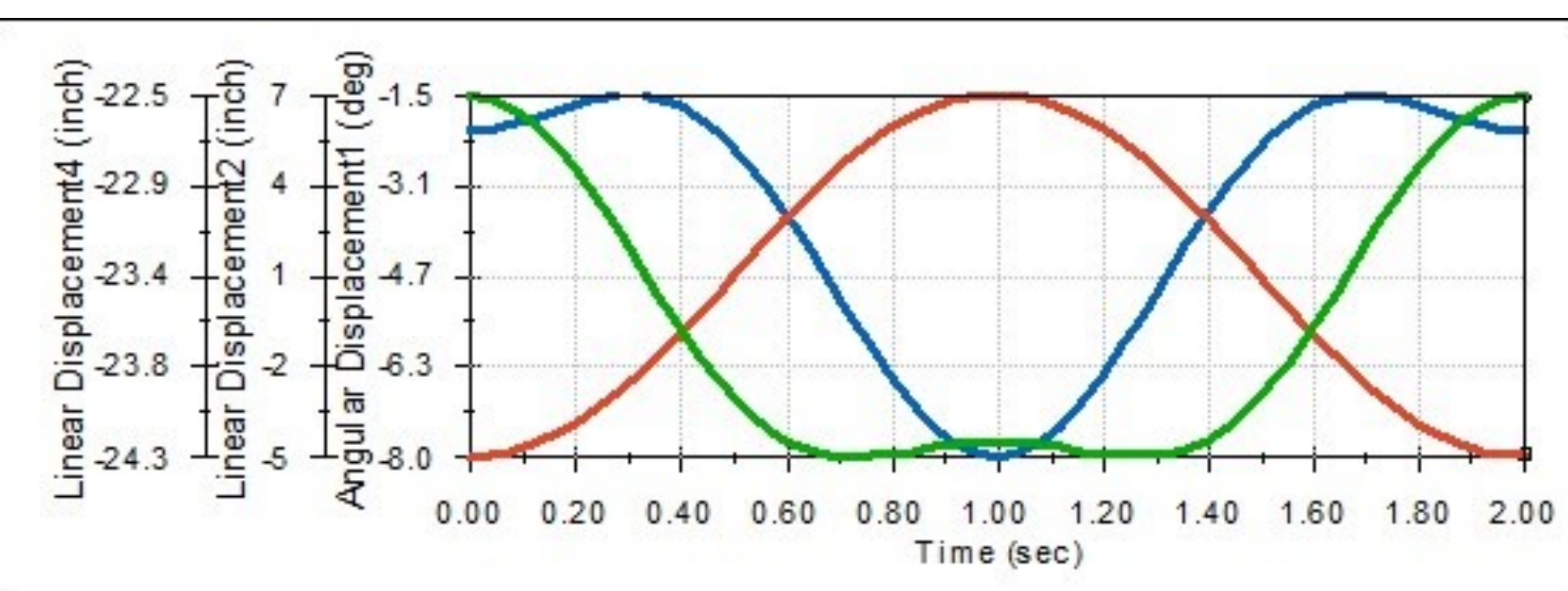
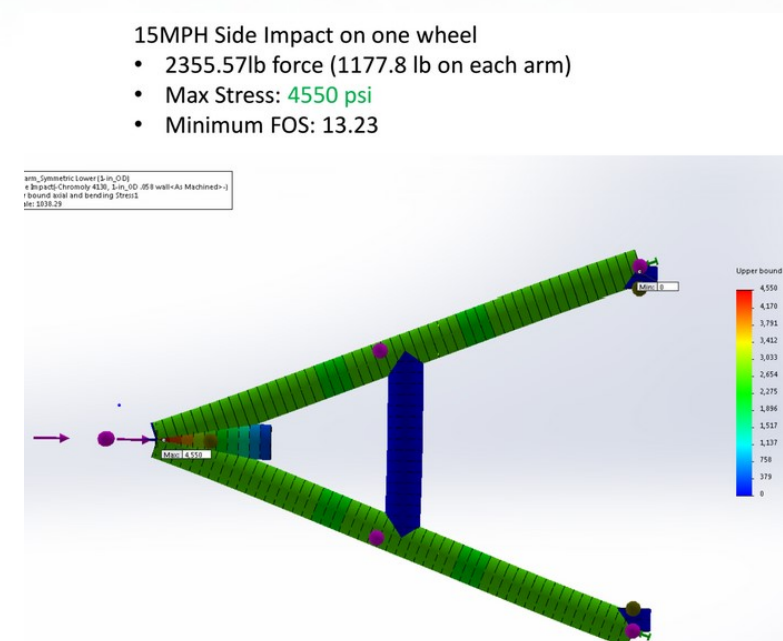
$$F * \Delta t = m * \Delta V$$

Assume impulse of 0.16 seconds

Car weight is 250 kg

$$F * 0.16 \text{ s} = 250 \text{ kg} * 13.4 \text{ m/s}$$

$$F = 20600 \text{ N or } 4710 \text{ lbs}$$



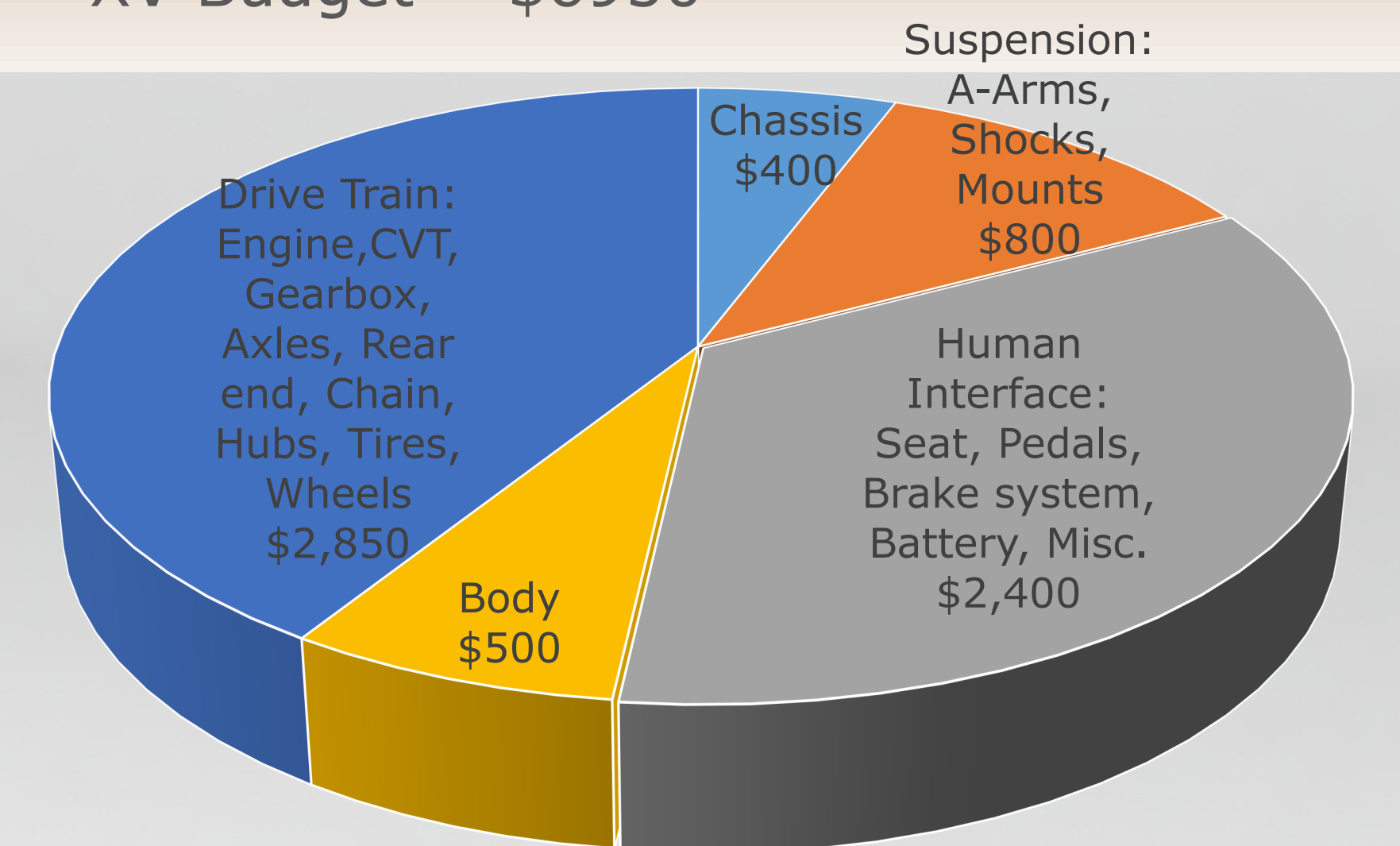
Suspension Geometry Analysis:

- ◆ Green : track change 1.8"
- ◆ Red: Travel 12"
- ◆ Blue: Camber change 6.5 degs

Competition - Events:

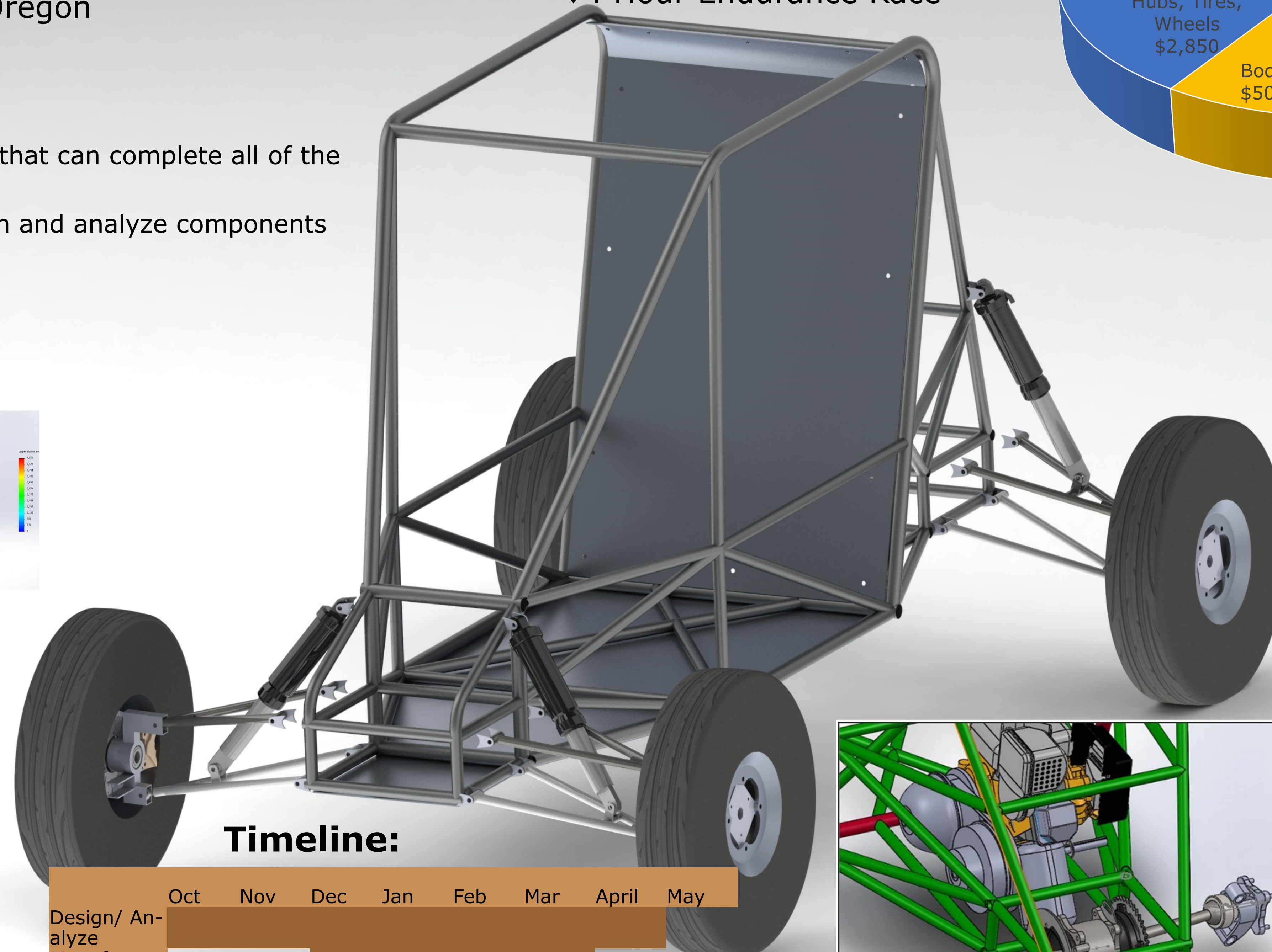
- ◆ Rock Crawl
- ◆ Acceleration
- ◆ Traction
- ◆ Maneuverability
- ◆ 4 Hour Endurance Race

XV Budget = \$6950

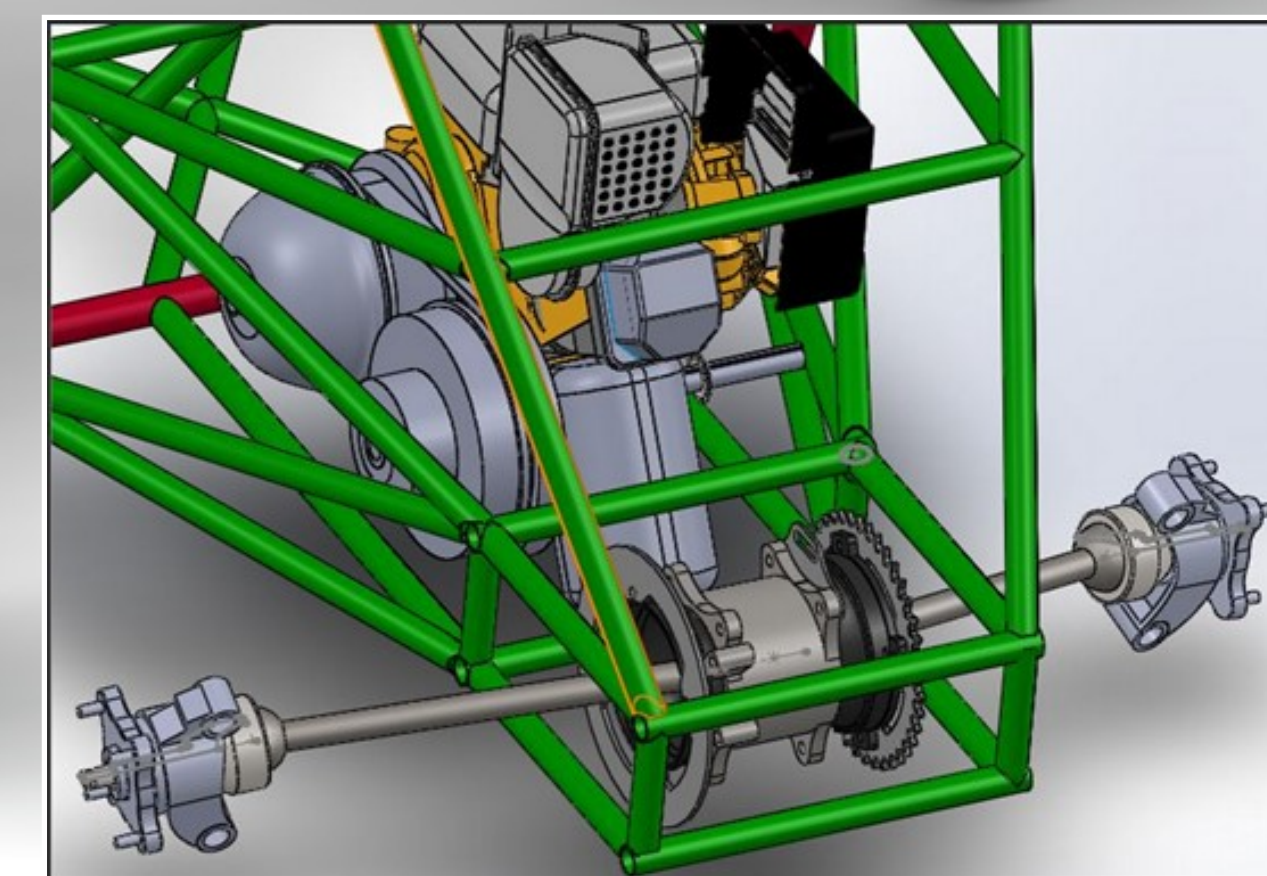
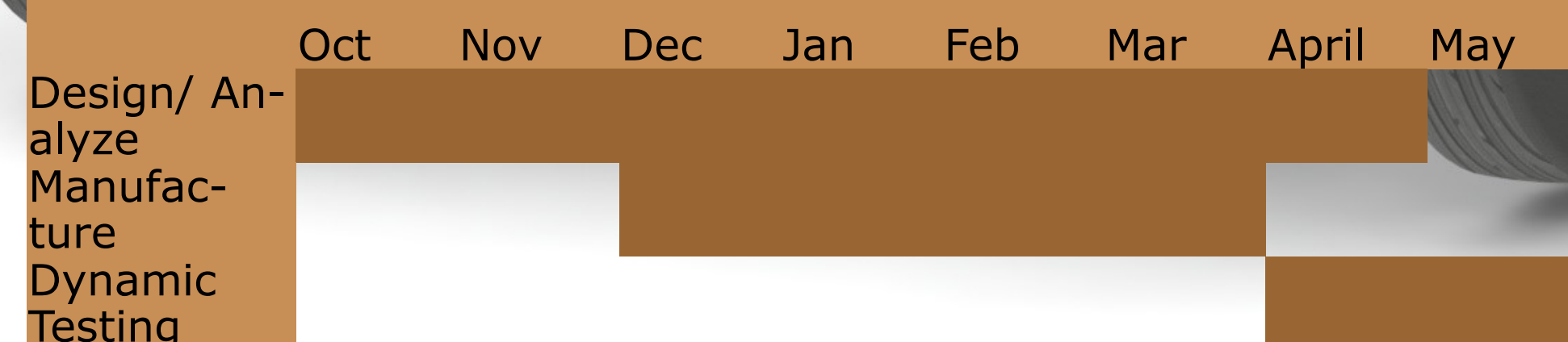


Specifications:

- ◆ Over all width = 60.5"
- ◆ Wheel Base = 85"
- ◆ Briggs and Stratton Engine
 - ◆ 14.5 ft/lb torque
 - ◆ 10 hp
- ◆ CVTech—transmission
 - ◆ CVT—with overdrive
- ◆ Gear Box
 - ◆ 1:1 Forward
 - ◆ 2.7:1 Reverse
- ◆ Final Drive 4:1
- ◆ Spool Rear End
- ◆ Full Independent suspension
- ◆ Fox Float R shocks
 - ◆ 6" of stroke
- ◆ Wheel Travel
 - ◆ 12"
- ◆ Ground Clearance
 - ◆ 16" full droop
 - ◆ 12.3" ride height
 - ◆ 4" full compression
- ◆ Steering
 - ◆ 1.5 turns lock to lock
 - ◆ Full Ackerman



Timeline:



Team Lead: Max Venaas
mvenaas@uci.edu

Sub Team Leads

Nick Borrelli
Jeff Beasley
Davon Mukhar
Rowell Dizon

Chassis/Suspension: TaeHee Lee, Tin Choung, Maissa Zulum, Ryan Roach, Bryce Hindes, Jason Nanez
Drivetrain: Danny Kim, Rowell Dizon
Human Interface: HunKee Kim, Matt Thomas, Shirin Ghaffarkhan, Karina Aifan, Frank Cai, JJ Javellana
Body: Pei Chi Wu, Eric Yee

Website: <http://sites.uci.edu/uciracing/>