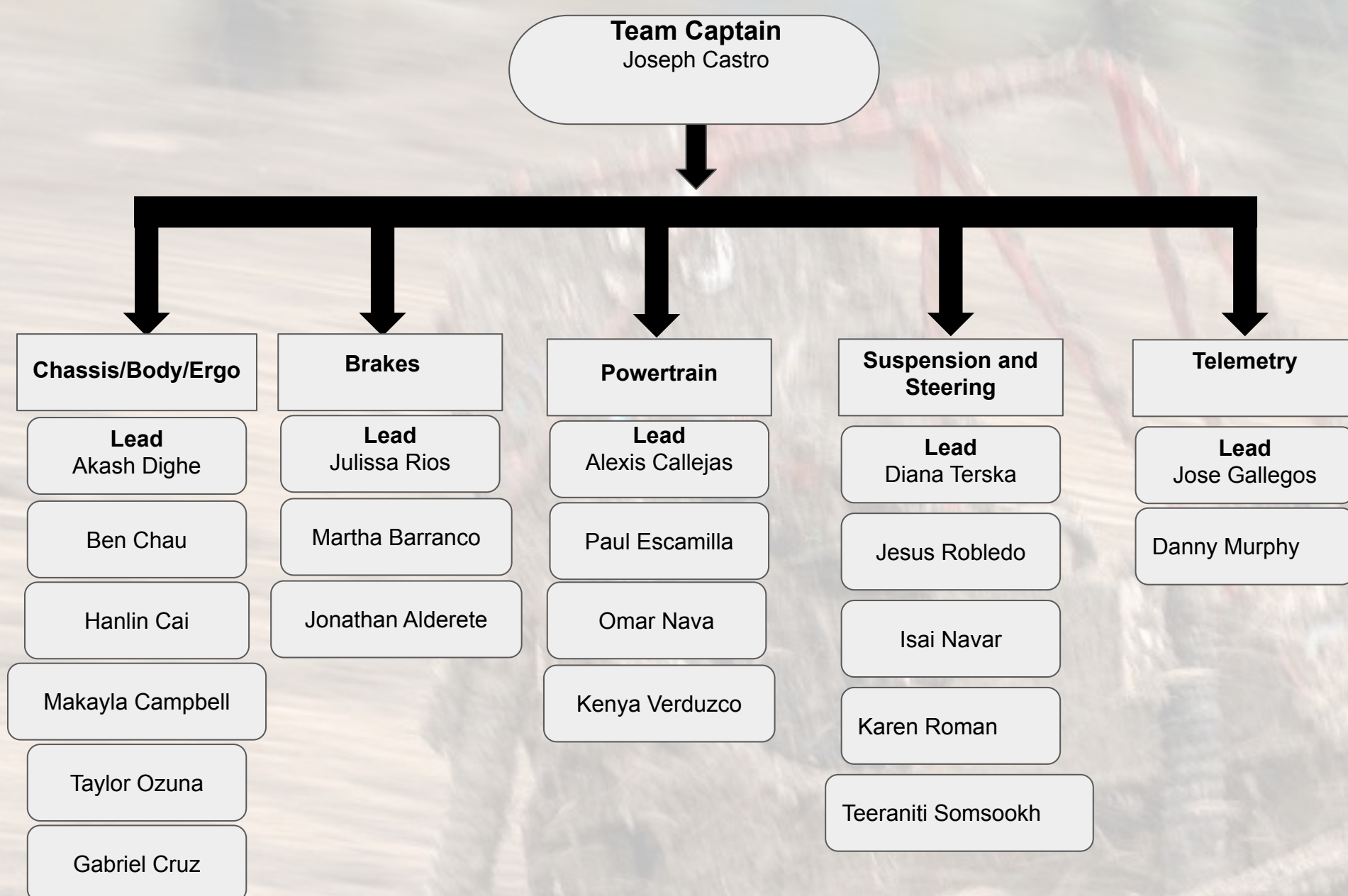


## ORGANIZATION



### Advisors:

Prof. McCarthy, Robert "Smitty" Smith, Phil Chipman, Ron Kessler

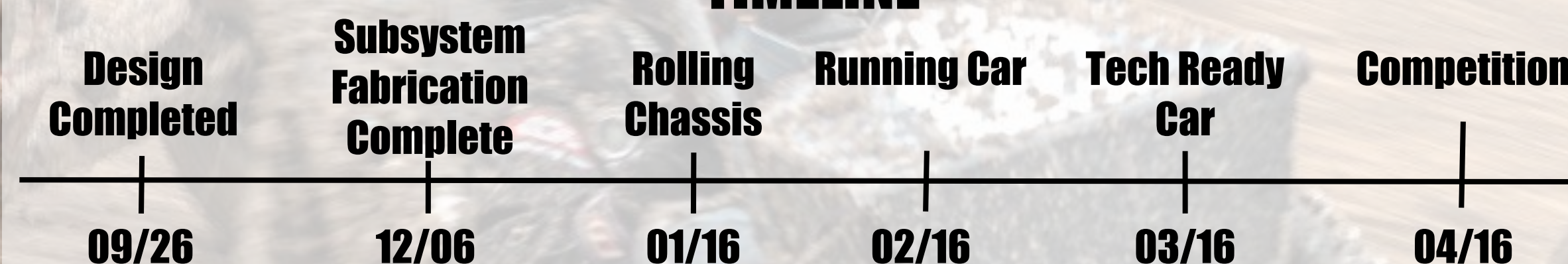
## GOAL - REFINEMENT

The 2019- 2020 vehicle was evaluated based on its placing at competition events and data collected during testing. The key characteristics necessary to place among the top 10 teams were identified and resulted in the following design criteria for Vandal for 2019-2020.

### Requirements:

- Top 10 Finish at the 2020 Baja SAE Competition
- Pass Tech Inspection on the first attempt
- Running Vehicle by February
- Validate all designs through extensive testing

### TIMELINE



## CHASSIS and Ergonomics

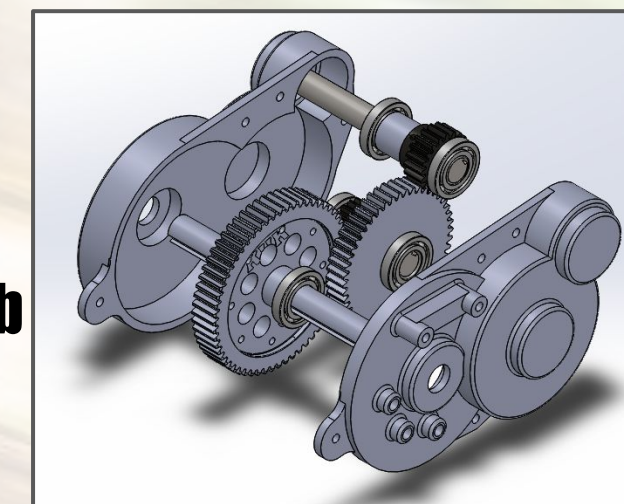
### Goal: Improve Driver Comfort

- Steering shaft member was raised by 2"
- Pedals moved 6.0" back and 2.75" down
- Steering shaft angle decreased by 15°



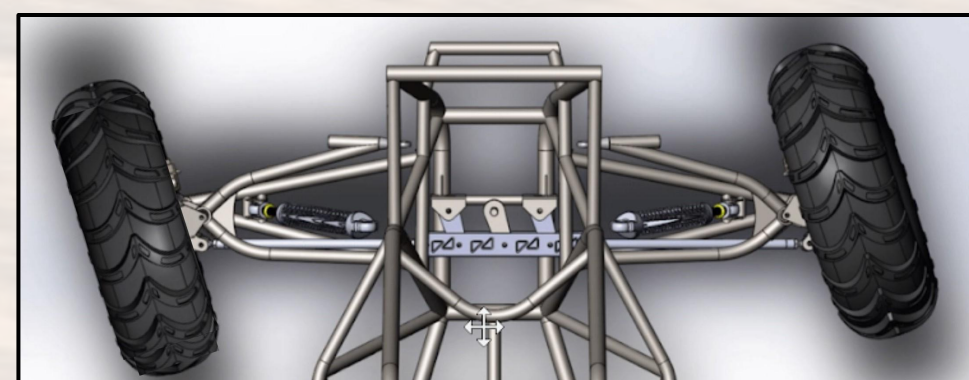
## POWERTRAIN

- Weight reduction of 10 lbs in Gearbox
- Gear ratio increased from 5.4:1 to 7.2:1
  - Projected increase in torque: 25 ft lb
  - Projected acceleration 12.1 ft/ s^2



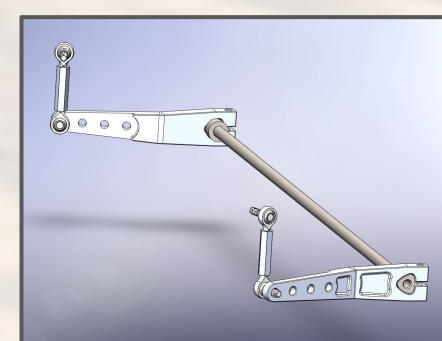
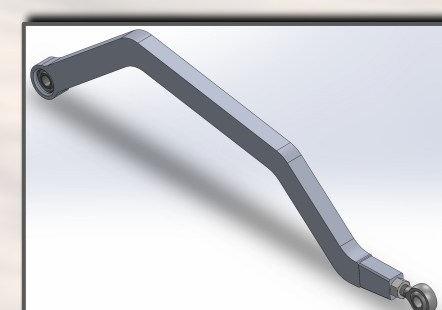
## FRONT SUSPENSION AND STEERING

- Reduced turning radius 16 ft → 7ft
  - Steering system changed from Rack and pinion to a Steering Linkage.
- Improved geometry for cornering
  - Front track width increased by 3"
- Improved ease of manufacturing to create spares



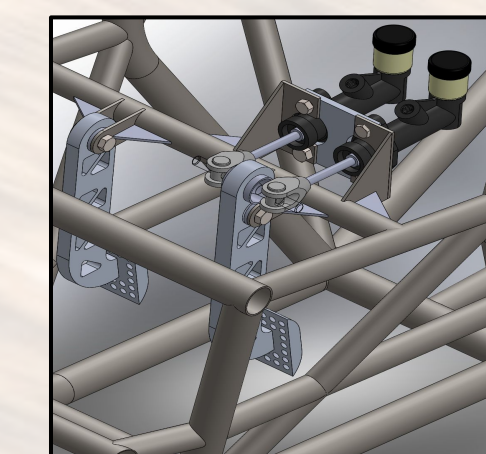
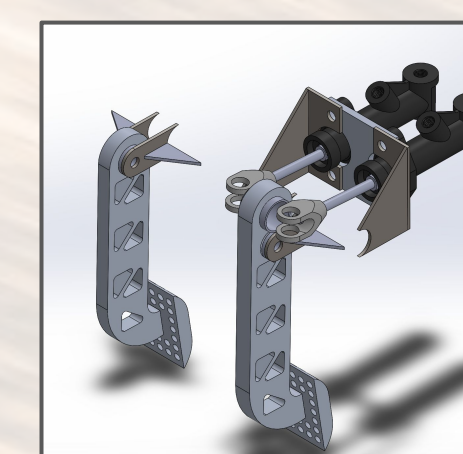
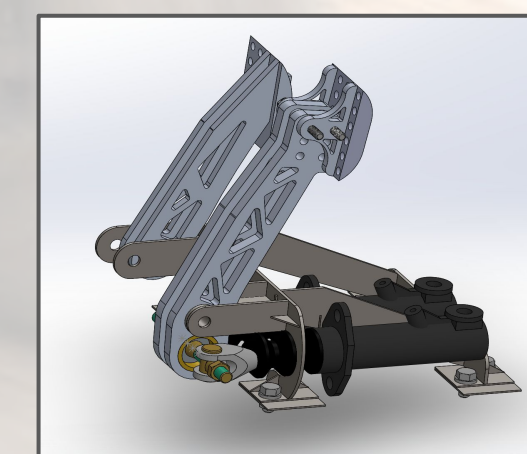
## REAR SUSPENSION

- Increased clearance between Lower Lateral Link & ground
- Decreased fabrication time of Trailing Arm to create spares
- Improved geometry for cornering by adding a rear Sway Bar
  - Adjustable roll stiffness



## BRAKES

- Reverse Pedal Box → Reverse Swing Pedals
- Increased thickness of Master Cylinder mounts by 0.145"
  - FOS 3.91:1 → 5.95:1
- Decreased Fabrication time by 33%



## Telemetry

- Improved data acquisition for all subsystems
  - Vehicle performance will be validated against design requirements

Component	Criteria
Microcontroller	Microcomputer capable of capturing data
Brake Pressure Sensor	Brakes: Used for measuring the force applied to the brake pedal
Temperature Sensor	Powertrain: Used for measuring and observing CVT temperature
Linear Potentiometer	Suspension: Measuring damper compression
Steering Angle Sensor	Steering: Steering Input
Accelerometer	Powertrain: Used for measuring acceleration

