NORTHERN ARIZONA UNIVERSITY

NASA HUMAN EXPLORATION ROVER COMPETITION

Presentation Two

Josh DeBenedetto (Frame)

Joey Annolino (Suspension)

Greg Dowske (Drive Train/Seating)

Kyle Carpentier (Brakes)

Joseph Andaya (Wheels)

Wilson January (Steering)

Project Description

NASA Human Exploration Rover Challenge revolves around NASA's plans to explore planets, moons, and asteroids across the solar system [1].

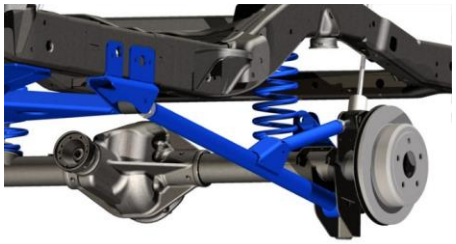
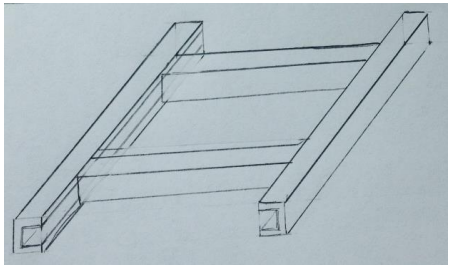
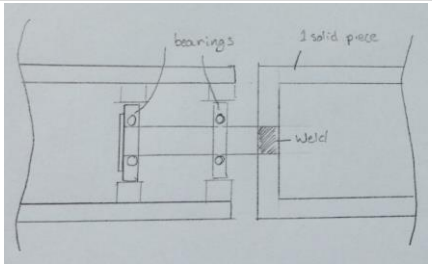
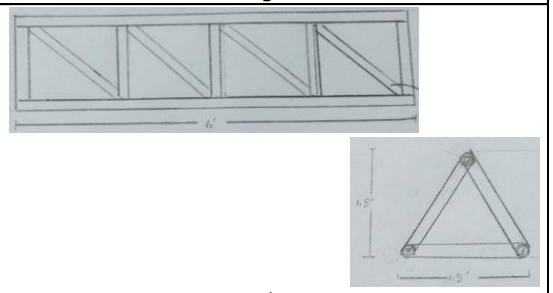
Our task is to:

- Design
- Construct
- Test

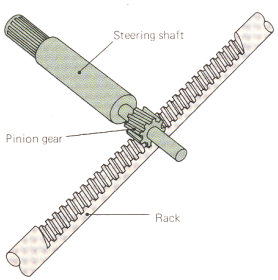
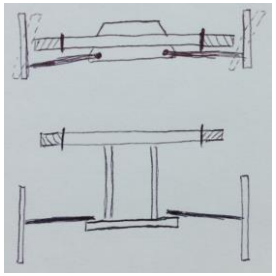
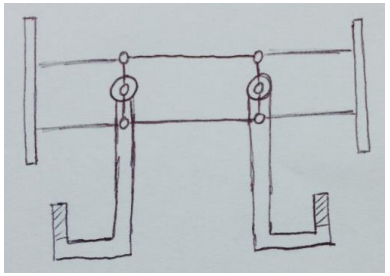
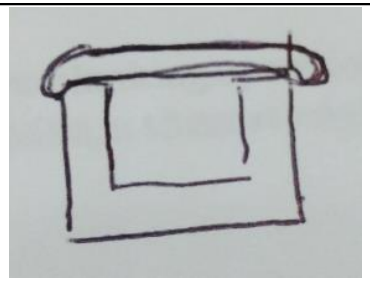
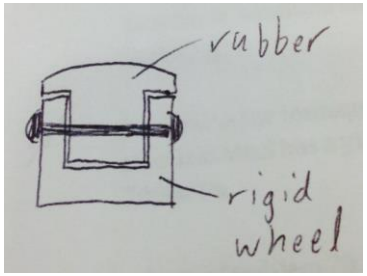
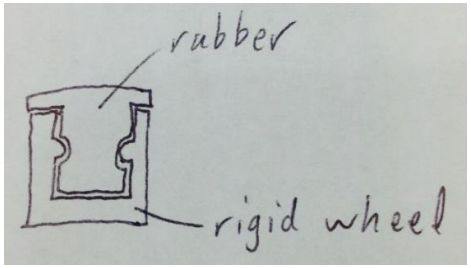
A human-powered rover capable of traversing various, demanding environments.

Project sponsored by: SAE, NASA

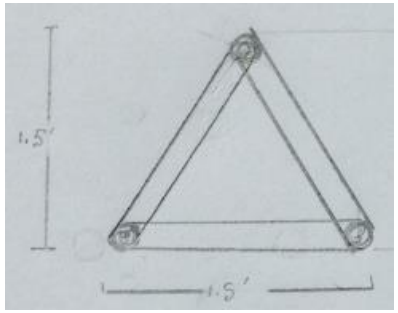
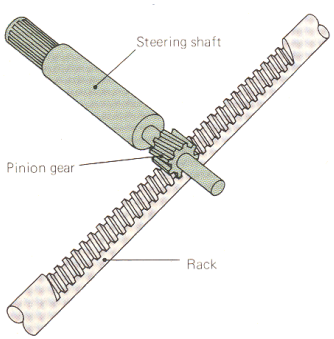
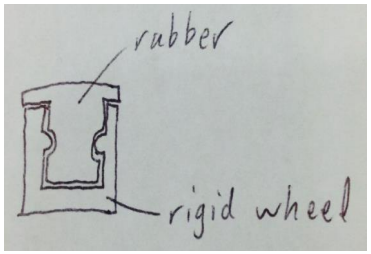
Designs Considered

Brakes	 Rim Pad	 Disc	 Stagecoach
Suspension	 Coil Over	 Shock Absorber	 Long Arm
Frame	 Car Frame	 Triangular Dynamic	 Triangular Static

Designs Considered

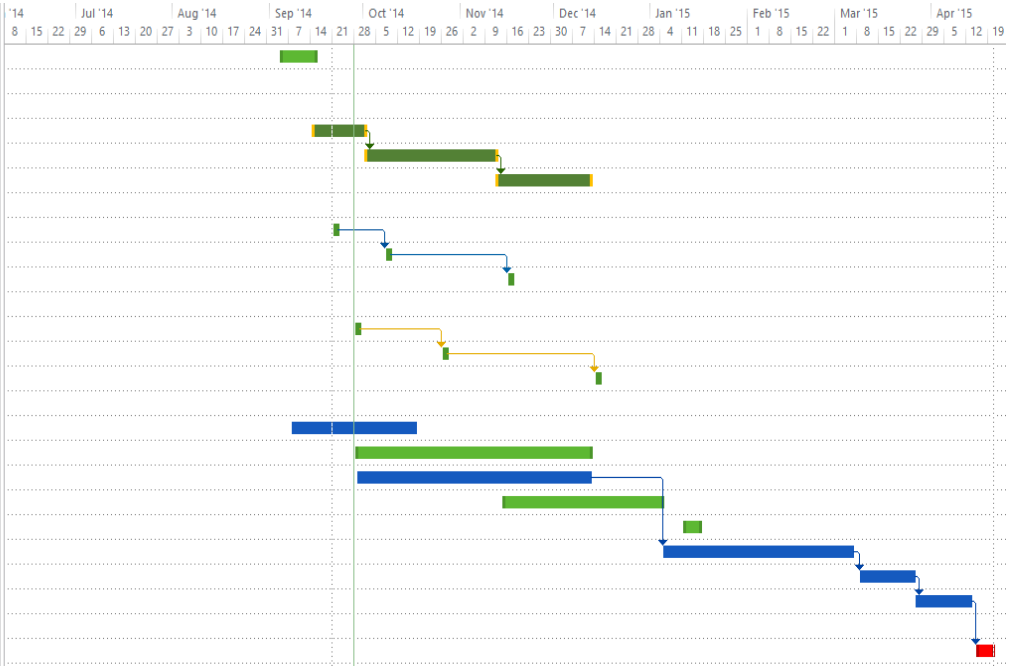
Steering	 Rack & Pinion	 Bicycle	 Under Seat
Wheel	 Tread-over	 Bolted Tread-In	 Clamped Tread-In
Seating	 Back-to-back	 Tandem	 Laying Down

Design Selected

Frame		**Suspension**	
Criteria		**Criteria**	
Versatility / Adaptability		Cost	
Fabrication Difficulty		Size	
Maintenance		Ride Quality	
Steering		**Seating**	
Criteria		**Criteria**	
Turning Resistance		Ease of Build	
Turn Ratio		Ergonomics	
Fabrication Difficulty		Central C.G.	
Wheels		**Brakes**	
Criteria		**Criteria**	
Availability		Obtainabilty	
Traction		Braking Distance	
Cost		Cost	

Schedule

	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		Team Chater	7 days	Fri 9/5/14	Mon 9/15/14	
2						
3		**Report**				
4		Report: Background	13 days	Mon 9/15/14	Wed 10/1/14	
5		Report: Preliminary	30 days	Thu 10/2/14	Wed 11/12/14	4
6		Report: Final	22 days	Thu 11/13/14	Fri 12/12/14	5
7		**Staff Meetings**				
8		Staff Meetings 1	1 day	Mon 9/22/14	Mon 9/22/14	
9		Staff Meetings 2	1 day	Thu 10/9/14	Thu 10/9/14	8
10		Staff Meetings 3	1 day	Mon 11/17/14	Mon 11/17/14	9
11		**Presentations**				
12		Presentations 1: Background & Designs	1 day	Mon 9/29/14	Mon 9/29/14	
13		Presentations 2: Something Cool	1 day	Mon 10/27/14	Mon 10/27/14	12
14		Presentations 3: Something Amazing	1 day	Mon 12/15/14	Mon 12/15/14	13
15		**Engineering**				
16		Research	30 days	Mon 9/8/14	Fri 10/17/14	
17		Bike Research Purchases	55 days	Mon 9/29/14	Fri 12/12/14	
18		Design	55 days	Mon 9/29/14	Fri 12/12/14	
19		Purchase Materials	37 days	Sat 11/15/14	Sun 1/4/15	
20		Establish and Pay for Transportation	5 days	Mon 1/12/15	Fri 1/16/15	
21		Build	45 days	Mon 1/5/15	Fri 3/6/15	18
22		Test	14 days	Mon 3/9/15	Thu 3/26/15	21
23		Maintanence	12 days?	Fri 3/27/15	Mon 4/13/15	22
24						
25		Competition	3 days	Thu 4/16/15	Mon 4/20/15	23



- Schedule: On Track

Budget

Available Funding:

- SAE: Possibly $2000 - Expected $1500
- NASA: No Funding
- ASNAU: Possible Travel Expenses

Anticipated Expense:

- Competition Lodging = $500
- Travel & Shipping = $6,000
- Fabrication = $0 ⇔ $500
- Parts & Prototyping = $1,200
- Total Anticipated Expense = $7,700 ⇔ $8,200

Expense to Date:

- SAE Membership - 7 members x $25 = $175