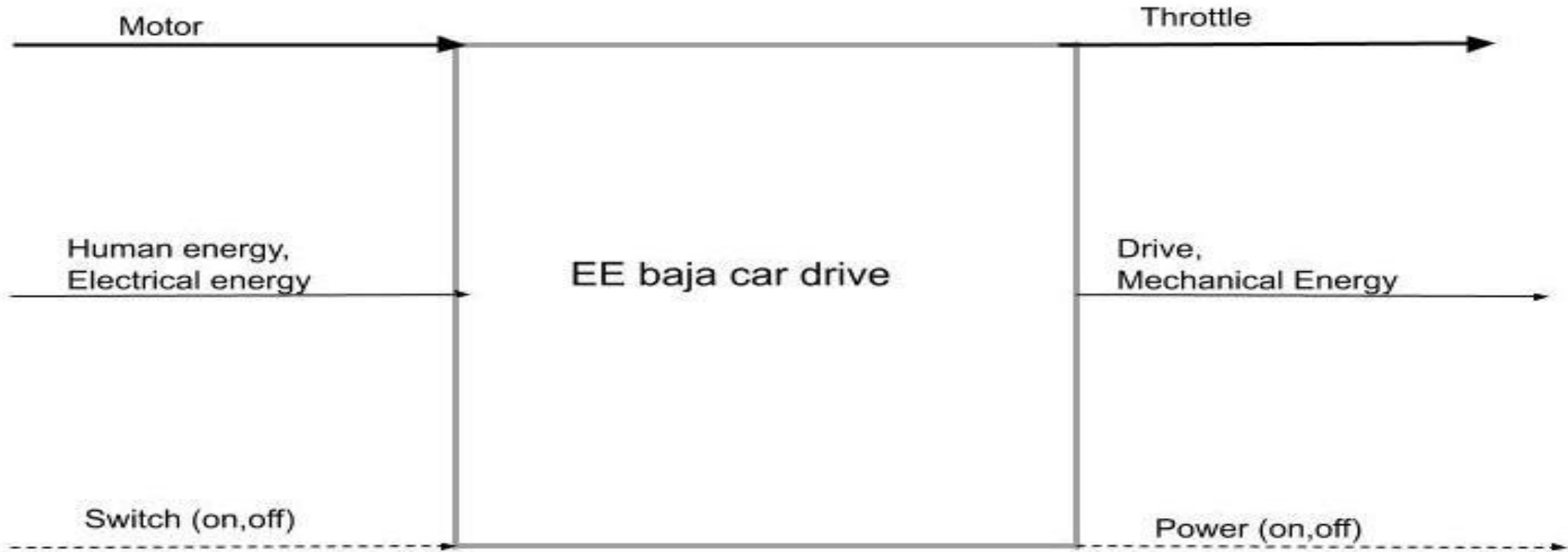


THE PROJECT

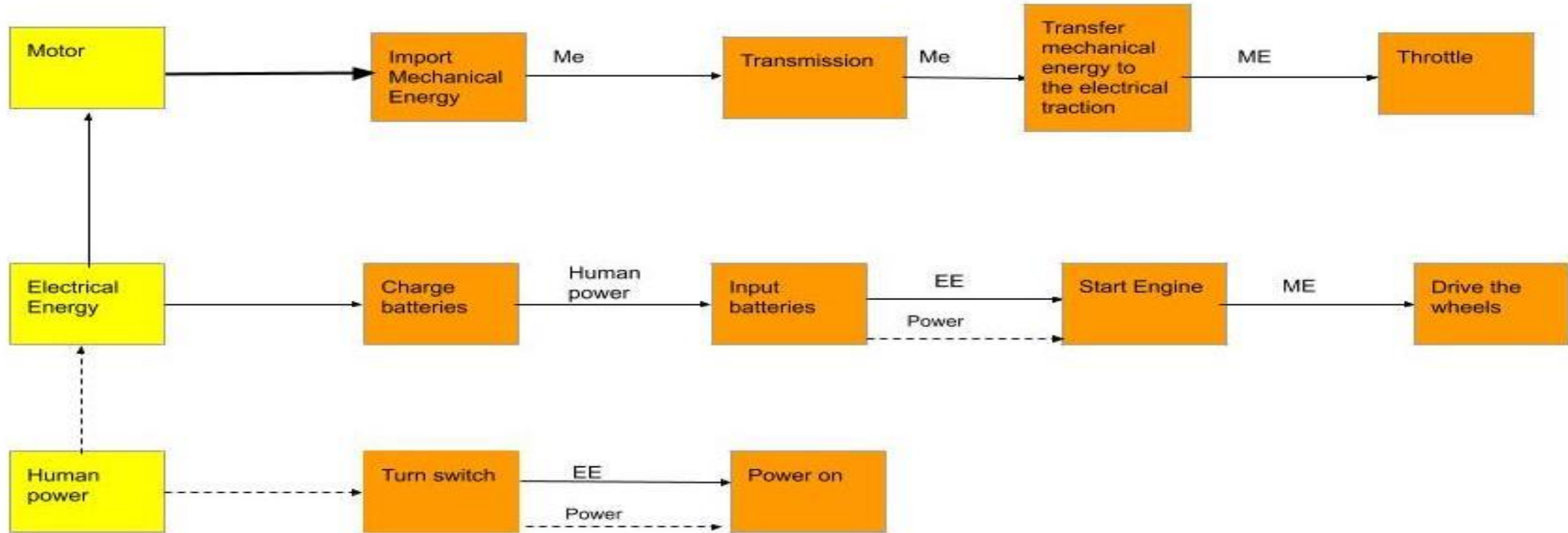
- TRANSFORM 2015-2016 BAJA CAR TO FULL ELECTRIC
- WORK ALONG EE CAPSTONE TEAM
- CONFORM TO E-BAJA SAFETY RULES
- COMPETE AGAINST 2019 BAJA CAR
- CLIENT IS PROFESSOR DAVID WILLY
- FINANCIALLY SPONSORED BY W.L. GORE
- MET WITH THE EE TEAM AND DR.YARAMASU



BLACK BOX

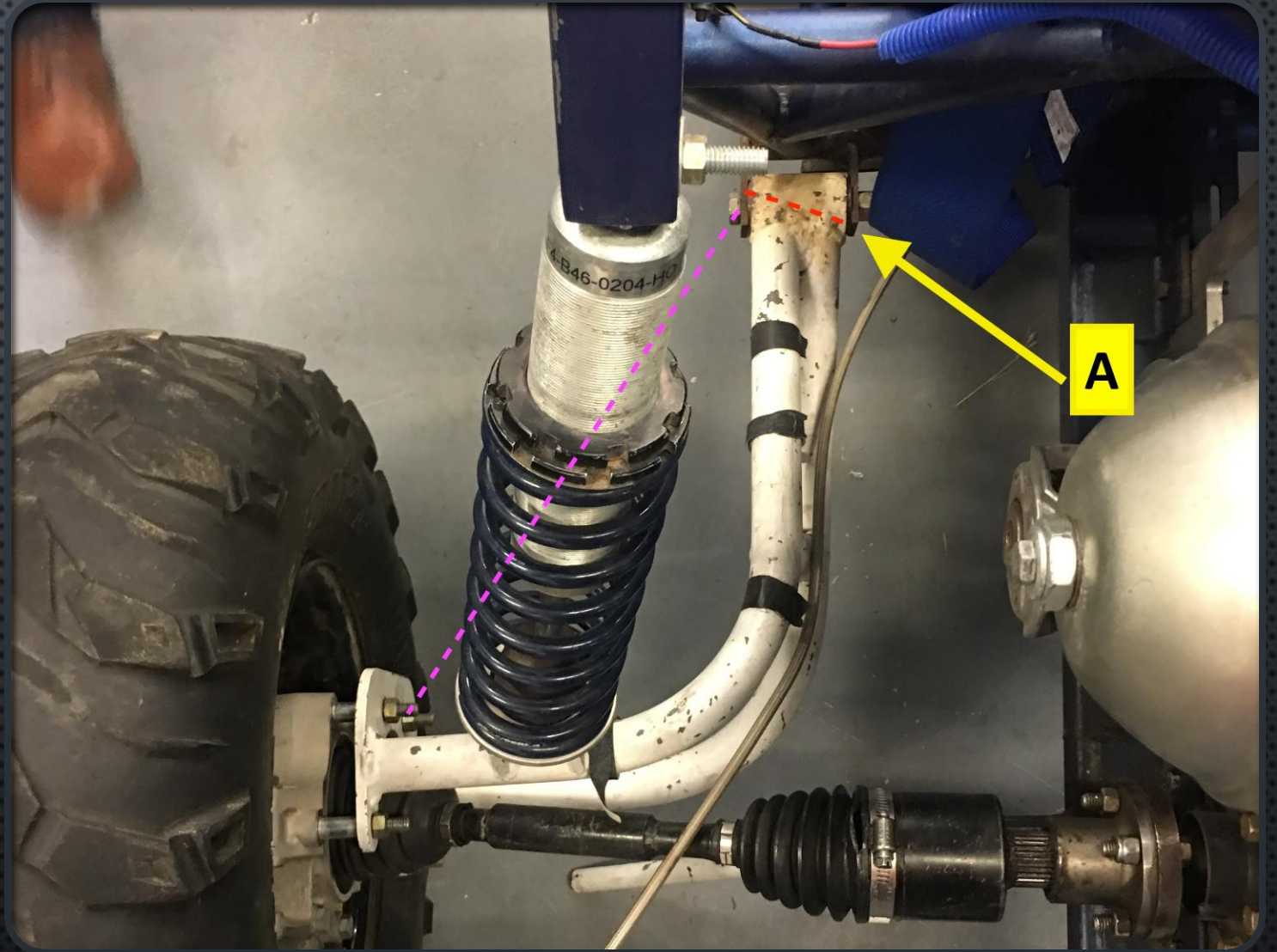


HYPOTHESIZED FUNCTIONAL MODEL


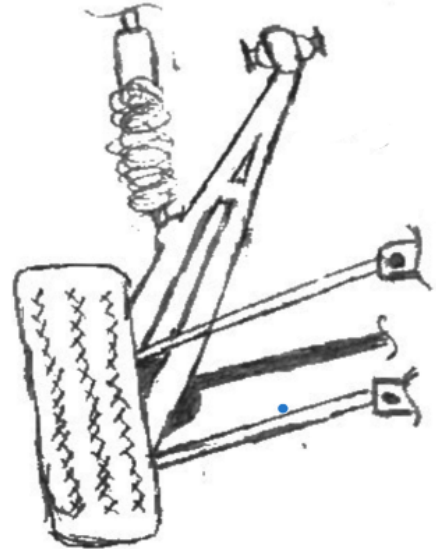
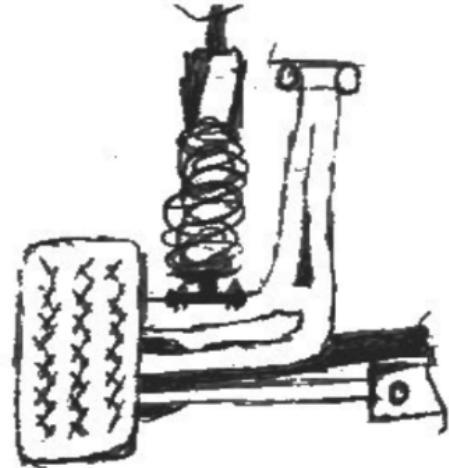


REAR SUSPENSION PROBLEM

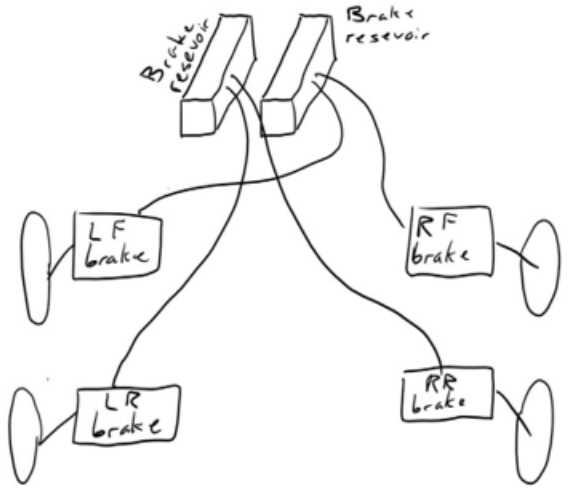
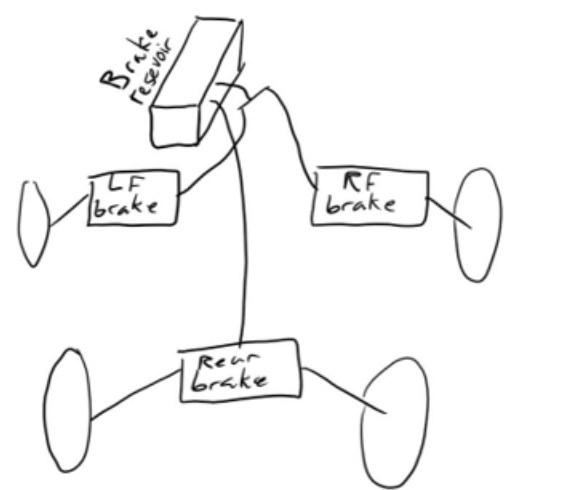
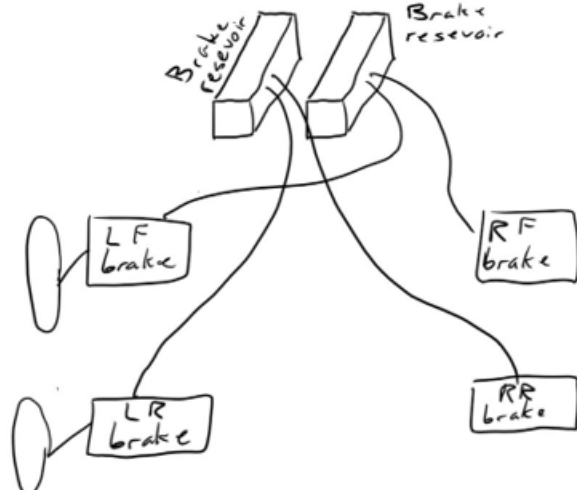
- L SHAPED TRAILING ARM
- LOW DEGREE OF FREEDOM
- LIMITS SPACE
- LACKS STABILITY



DECISION MATRIX (REAR SUSPENSION)

		Concept				Original	
Criteria	Weight						
		Rating	Weighted score	Rating	Weighted score	Rating	Weighted score
Safety	0.25	75	18.75	90	22.5	25	6.25
Cost	0.1	75	7.5	60	6	45	4.5
Supports Battery / Motor	0.25	80	20	100	25	15	3.75
Less Fabrication	0.15	50	7.5	65	9.75	35	5.25
Space	0.25	25	6.25	100	25	25	6.25
Total (%)	1		60		88.25		26
Relative Ranking			2		1		3

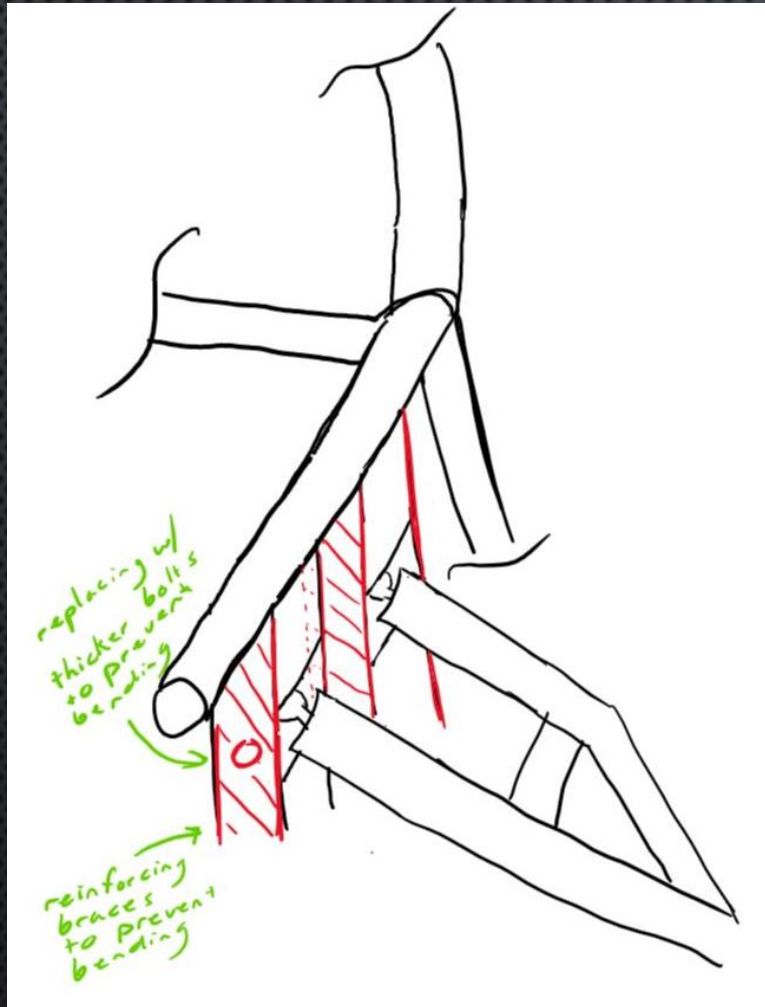
DECISION MATRIX (BRAKES)

		Concept				Original	
Criteria	Weight						
		Rating	Weighted score	Rating	Weighted score	Rating	Weighted score
Safety	0.25	100	25	100	25	100	25
Cost	0.1	75	7.5	80	8	75	7.5
Efficiency	0.25	80	20	90	22.5	80	20
Less Fabrication	0.15	50	7.5	65	9.75	50	7.5
Space	0.25	45	11.25	75	18.75	45	11.25
Total (%)	1		71.25		84		71.25
Relative Ranking			2		1		3

DECISION MATRIX (FRONT KNUCKLES)

Criteria	Weight	Original		Concept	
		Rating	Weighted Score	Rating	Weighted Score
Safety	0.25	75	18.75	85	21.25
Low Cost	0.15	95	14.25	30	4.5
Support Suspension System	0.10	100	10	100	10
Durability	0.20	70	14	95	19
Less Fabrication	0.10	35	3.5	70	7
Client Requirement	0.20	90	18	50	10
Total (%)	1		78.5		71.75
Relative Ranking			1		2

DECISION MATRIX (FRONT SUSPENSION)

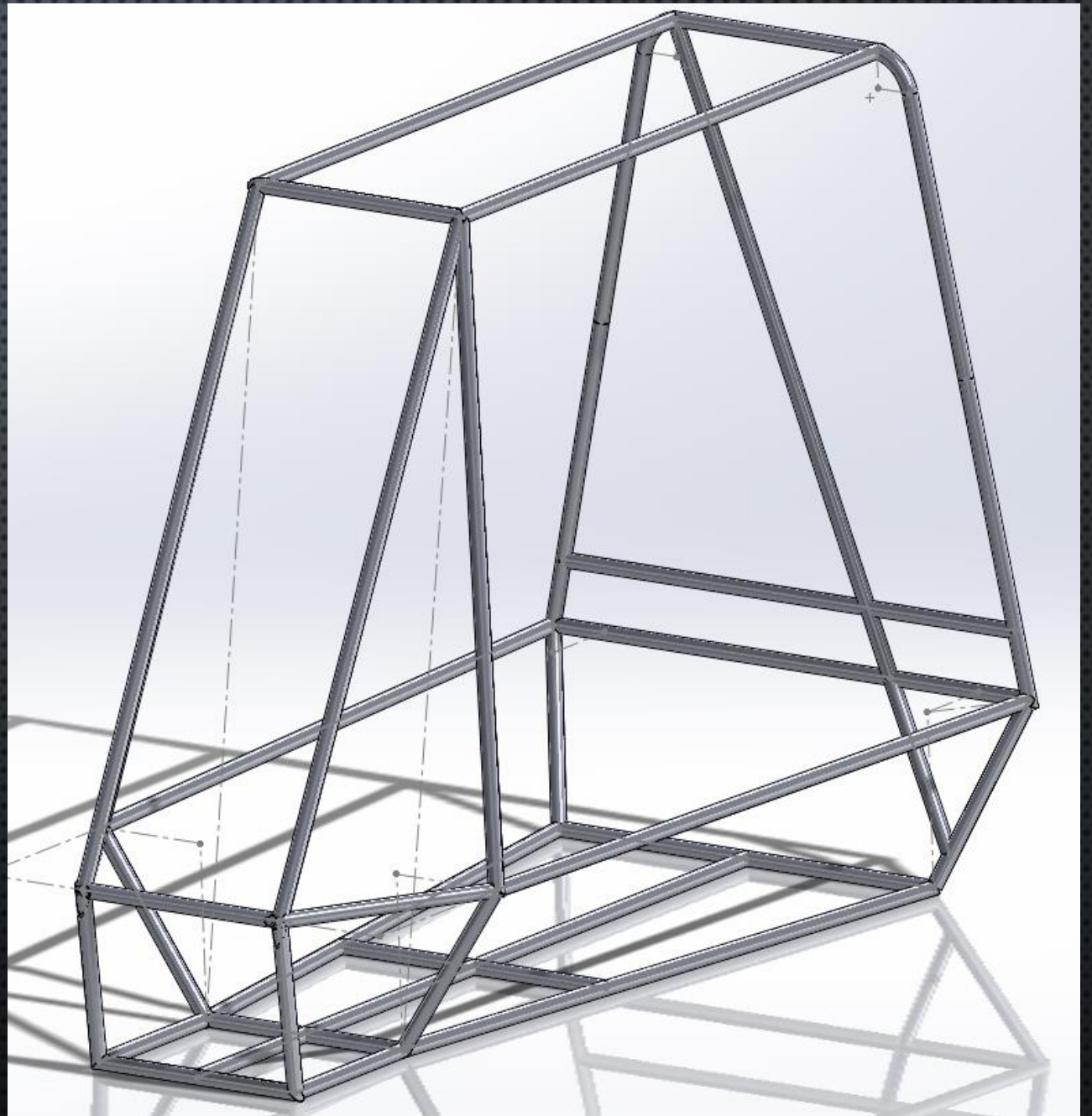


		New Design		Original	
		Rating	Weighted score	Rating	Weighted score
Safety	0.25	100	25	50	12.5
Cost	0.15	50	7.5	70	10.5
Strength	0.25	100	25	50	12.5
Less Fabrication	0.1	75	7.5	75	7.5
Space	0.25	50	12.5	75	18.75
Total (%)	1		77.5		61.75
Relative Ranking			1		2

CAD

- ROUGH STARTING CAD OF FRAME
- STARTED FEA ANALYSIS OF THE FRAME
- NEED TO ADD PLACE FOR BATTERY AND MOTOR

Drew Stringer, EBaja Conversion, Team 19F14



BILL OF MATERIALS

- Tentative BOM
- Specific components on vehicle, not whole vehicle
 - No electronics present
 - New components replacing old systems
- No dimensions due to client wishes
- Plan on reusing components
 - Bolts
 - Heims
 - Drive line

Part #	Part Name	Qty
1	Steering - Knuckle Link	2
2	Steering Knuckles	2
3	Tie Rod	2
4	Tie Rod Heims	2
5	Rack Heims	2
6	Kingpin Heim	4
7	Rack and Pinion	1
8	Steering Shaft	1
9	Steering Wheel	1
10	Steering Heim	1
11	Steering - Knuckle Link Bolts	4
12	Brake Caliper	3
13	Brake Rotors	3
14	Brake Fluid Line	3
15	Brake Cylinder	1
16	Caliper Bolt	6
17	Tire	4
18	A-Arm Heim	8
19	A-Arm Heim Bolt	8
20	Angle Trailing Arm	2
21	Heim Joint	2
22	Support Brackets	4
23	Rear Shocks	2
24	Trailing Arm Bolt	8
25	Drive Line	2
26	Heat Shield	1
27	Frame Member	2
28	Support Bracket Bolt	8

BUDGET PLAN

- BUDGET GIVEN: \$3,000
- BUDGET ALLOCATED: \$2,748.21
- BUDGET PLAN
 - \$250 OF FLEXIBILITY DUE TO UNCERTAINTY (MUST INCREASE)
 - DRIVE TRAIN AND GEAR BOX
- CERTAIN ITEMS TO BE MACHINED
- EE HAS THEIR OWN BUDGET
- COST LIST IN APPENDIX A



THANK YOU!

QUESTIONS?

APPENDIX A

Bill of Materials								
Team				E - Baja				
Part #	Part Name	Qty	Description	Functions	Material	Dimensions	Unit Cost	Link to Cost estimate
1	Steering - Knuckle Link	2	Extra attachment to the steering kn	For a better ste	Steel	N/A	N/A	
2	Steering Knuckles	2	Multiaccess unit on wheel	Central place a	Steel	N/A	\$130.00	https://www.amazon.com/Automotive-Replac
3	Tie Rod	2	Rod between the wheel and the rack	connects steer	Steel	N/A	\$35.00	https://www.amazon.com/Empi-Ball-Joint-Left-
4	Tie Rod Heims	2	joint with added degree of freedom	Connects rod t	Steel	N/A	\$38.95	https://www.amazon.com/American-Star-Chron
5	Rack Heims	2	joint with added degree of freedom	connects rack f	Steel	N/A	\$38.95	https://www.amazon.com/American-Star-Chron
6	Kingpin Heim	4	joint with added degree of freedom	connects knuckl	Steel	N/A	\$120.00	https://www.amazon.com/Joint-Right-Thread-C
7	Rack and Pinion	1	Rod with teeth connected to pinion	Connect wheel	Steel	N/A	\$144.76	https://www.ebay.com/i/173951766370?chn=r
8	Steering Shaft	1	Shaft directed from wheel to rack ar	Connects wheel	Steel	N/A	\$15.80	https://www.grainger.com/product/3ACU2?qclid
9	Steering Wheel	1	Wheel for rotation	Connected to s	Steel	N/A	\$48.08	https://www.carid.com/grant/classic-series-slot
10	Steering Heim	1	Support holding the steering shaft	Hold steering s	Steel	N/A	\$120.00	https://www.amazon.com/Joint-Right-Thread-C
11	Steering - Knuckle Link Bolts	4	Fasteners on link	Holds link toge	Steel	N/A	\$1.36	https://www.homedepot.com/p/3-8-in-16-x-2-
12	Brake Caliper	3	Clamp on brake rotor	Tightens to cre	Steel	N/A	\$50.00	https://www.appletreeauto.com/UNIVERSAL-DI
13	Brake Rotors	3	Metal plate ttached to wheel	Rotates until c	Steel	N/A	\$64.65	https://www.amazon.com/Empi-Brake-Rotor-C
14	Brake Fluid Line	3	Tube connected from cylinder to cal	Allows fluid to	Steel	N/A	\$5.29	https://www.autozone.com/brakes-and-traction
15	Brake Cylinder	1	Chamber connected to brake lines	Contains brake	Steel	N/A	\$62.99	https://www.appletreeauto.com/3-4-RECT.-MAS
16	Caliper Bolt	6	Fasteners on caliper	Connects calip	Steel	N/A	\$1.36	https://www.homedepot.com/p/3-8-in-16-x-2-
17	Tire	4	Offroad	offroad tracter	Steel	N/A	\$199.99	https://www.rockymountainatvmc.com/tires-an
18	A-Arm Heim	8	joint with added degree of freedom	connects A-Arr	Steel	N/A	\$31.95	https://www.amazon.com/American-Star-Inch-
19	A-Arm Heim Bolt	8	Fastener on frame for heim	Connects heim	Steel	N/A	\$1.36	https://www.homedepot.com/p/3-8-in-16-x-2-
20	Angle Trailing Arm	2	Arm attached to shock and to rear k	Absorb elastic	Steel	N/A	N/A	
21	Heim Joint	2	joint with added degree of freedom	Replaces hinge	Steel	N/A	\$120.00	https://www.amazon.com/Joint-Right-Thread-C
22	Support Brackets	4	parallel rods from frame to knuckle	Maintains stabl	Steel	N/A	\$20.00	https://www.amainhobbies.com/losi-baja-rey-a
23	Rear Shocks	2	Spring loaded rod supporting vehicle	Absorbs impac	Steel	N/A	\$1,495.00	https://www.ridefox.com/product.php?m=utv&
24	Trailing Arm Bolt	8	Fastener on frame for heim	Connects heim	Steel	N/A	\$1.36	https://www.homedepot.com/p/3-8-in-16-x-2-
25	Drive Line	2	Shaft connected to drive train	Power transfer	Steel	N/A	Reusing	
26	Heat Shield	1	Metal plate between driver and mot	Protects driver	Steel	N/A	N/A	
27	Frame Member	2	Added member in secondary section	Attachment of	Steel	N/A	N/A	
28	Support Bracket Bolt	8	Fastener for keeping in place	Connects supp	Steel	N/A	\$1.36	https://www.homedepot.com/p/3-8-in-16-x-2-
Total Cost Estimate:							\$2,748.21	