

Please submit this completed application and supporting documentation to Sustainability-Committee@Illinois.edu. The Working Group Chairs will be in contact with you regarding any questions about the application. If you have any questions about the application process, please contact SSC at Sustainability-Committee@illinois.edu.

GENERAL INFORMATION

Project Title: Total Amount Requested from SSC: Amount Requested as:

\$10,000.00 Grant (LOAN or GRANT)

SCOPE, SCHEDULE, AND BUDGET VERIFICATION

If the project required you to obtain information from Facilities & Services Planning Division, please include that here and attach any supporting documentation.

Scope & Schedule

What is the plan for project implementation? Describe the key steps of the project including the start date, target completion date, target date for submitting a final report, and any significant tasks or milestones in the table below. Please be as detailed as possible. Insert additional rows if necessary.

Our scope: Finish our contribution to Midwest Hyperloop by completing as much manufacturing and testing by the end of the semester, and then finish integration and testing before the competition in July. Build High-Voltage battery pack with integrated Battery Management System (BMS), and test this High-Voltage battery pack with our EMRAX

motor on a Dynamometer located in the Department of Agricultre and Bio Engineering building. After the semester is over, move components to Purdue where all three teams (UIUC, University of Cincinnati, and Purdue) will continue to work on building and testing the full vehicle before it is shipped off to SpaceX for the competition in July.

Illini Hyperloop

Our scope entails machining the drivetrain for our EMRAX motor, and having our vehicle's Software fully able to control the motor.

In addition, our scope contains items that we intend on using for the next competition, such as a custom BMS, and more magnet development and testing.

Task	Timeframe (# of weeks)	Estimated Completion Date
Aquire battery modules (already on order)	1	April 10th, 2019
Integrate Battery and Battery Management System (BMS) together	2	April 21st, 2019
Aquire materials for EMRAX motor Dynamometer Testing	1	April 12th, 2019
Manufacture Drivetrain for EMRAX motor Dynamometer Testing	1	April 21st, 2019
Manufacture Mount for EMRAX motor Dynamometer Testing	1	April 21st, 2019
Aquire materials to fabricate vehicle impact attenuator	1	April 21st, 2019
Manufacture vehicle impact attenuator	1	April 27st, 2019
No-load testing of EMRAX motor with Integrated battery with manual control	1 day	April 26th, 2019
Complete vehicle Software Frontend and Backend to control EMRAX motor via CANbus	4	April 27th, 2019
No-load testing of EMRAX motor with Integrated battery with software control	1 day	April 28th, 2019
Dynamometer testing of EMRAX with Integrated battery with software control	2 days	April 30th, 2019
Integrate Battery and BMS into pressure vessel	1	May 4th, 2019
Test vehicle Software with all sensors integrated	1	April 28th, 2019
Test Rocket M900 radios for network communication. Test with vehicle Software	1	April 28th, 2019
Complete PCB development board for custom BMS	4	May 4th, 2019
Create model for Magnetic Propulsion Disks using empirical data	4	May 4th, 2019
Moving components to Purdue for final assembly	1	May 12th, 2019
Full vehicle integration and testing	6	Late June 2019
Shipping vehicle to Hawthorne, California for the competition	1	July 7th, 2019
Competing in the SpaceX Hyperloop Pod Competition	1	July 21st, 2019
Sumbit final report to SSC after Competition	4	August 30th, 2019

Budget

List all budget items for which funding is being requested under the appropriate category in the following table. Include cost and total amount for each item requested. Please be as detailed as possible. Insert additional rows if necessary.

Item	Cost Per Item	Quantity	Total Request	
Equipment & Construction Costs				
High-Voltage "Powertrain" Components				
Li-Po Batteries (custom 6s4p) from MaxAmps	\$600.00	5	\$3,000.00	
High-Voltage DC contactor, EV200AAANA	\$129.51	4	\$518.04	
High-Voltage precharge Relay, Omron G6DN-1A	\$1.52	5	\$7.60	
High-Voltage precharge resistor, TWW10J39RE	\$1.52	10	\$15.20	
30 feet 1/0 AWG copper wire	\$84.80	1	\$84.80	
Ring Connectors (5 pack) for 1/0 AWG wire	\$8.98	5	\$44.90	
Crimp Tool for 1/0 AWG Ring Connectors	\$79.00	1	\$79.00	
20 feet 20 AWG copper wire	\$12.98	1	\$12.98	
800 Amp Fuse, Littlefuse JLLN800.X	\$483.97	1	\$483.97	
Ring Connectors (10 pack) for 4 AWG wire	\$10.43	2	\$20.86	
120V Li-Ion Battery charger, Delta Q ICL1200	\$700.00	1	\$700.00	
Low-Voltage Electronics Components				
Ubiquiti Rocket M900	\$169.02	2	\$338.04	

Wayo Plada Antonna for Poskot M000	\$20 50	4	\$82.36
POE Injector for Deslet M000	\$20.37	7	\$2.30
POE Injector for Rocket M900	\$15.72	2	\$31.44
12V Network Switch	\$20.00	2	\$40.00
Beaglebone Black (Main computer)	\$62.38	2	\$124.76
MSP3101P2-ND Pressure Sensor	\$78.17	2	\$156.34
OJ5028 optical sensor	\$108.00	2	\$216.00
6 feet Cable raceway	\$25.91	2	\$51.82
100 feet, assorted 22 AWG stranded hook-up wire	\$10.68	5	\$53.40
Heat Shrink wire insulator	\$7.99	2	\$15.98
Adhasiya wira alamna	00.93	2	\$17.08
Autesive wite clamps	\$0.77	<u>2</u>	\$17.50
PCB Components			
RES SMD 75 OHM 1% 1W 2512	\$0.14	100	\$13.66
RES SMD 10K OHM 1% 1/10W 0603	\$0.02	100	\$1.70
RES SMD 100K OHM 1% 1/10W 0603	\$0.01	100	\$1.01
RES SMD 49 9K 0HM 1% 1/10W 0603	\$0.02	10	\$0.24
RES SMD 100 0HM 1% 1/4W 1206	\$0.02	10	\$0.84
RES SMD 10 0HM 1% 1/4W 1200	\$0.03	100	\$3.22
RES SMD 10 0HM 1/0 1/ 4W 1200	\$0.03	100	\$1.70
RES SMD 49.9 0HM 1% 1/10W 0605	\$0.02	100	\$0.42
RES SMD 100 0HM 1% 1/10W 0603	\$0.04	10	\$0.42
RES SMD 10 0HM 1% 1/10W 0603	\$0.02	100	\$1.70
RES SMD 200 OHM 5% 1W 2512	\$0.33	10	\$3.33
RES SMD 0 OHM JUMPER 1/10W 0603	\$0.03	10	\$0.34
RES SMD 2K 0HM 1% 1/10W 0603	\$0.02	100	\$1.70
RES SMD 1 OHM 1% 1/10W 0603	\$0.05	10	\$0.49
RES 0.39 OHM 1% 1/10W 0603	\$0.16	10	\$1.58
RES SMD 1K OHM 1% 1/10W 0603	\$0.02	200	\$3.40
CAP CER 111F 50V X7R 0805	\$0.04	100	\$4.47
DIODE 7ENER 6 2V 1 25W DO2144C	\$0.23	100	\$22.84
MOSEET N_CH 60V 320MA SOT_23_3	\$0.23	100	\$18.96
TMCF700422DD7001	\$0.17	100	\$10.90
IM35700452BF2QQ1	\$0.43	2	\$10.00
BQ/0PL455ATPFCTQ1	\$18.34	4	\$/3.30
PCB Blank	\$19.16	2	\$38.32
Mechanical Components			
Cast Iron V-Belt Pulley	\$13.04	2	\$26.08
Emrax Flange Mount Drive Shaft	\$26.75	1	\$26.75
Emrax Flange Mount Drive Base	\$35.37	1	\$35.37
Emrax Flange Mount Drive Machining	\$420.00	1	\$420.00
Emrax Arms Material	\$49.65	1	\$49.65
Emrax Arms Machining	\$60.00	2	\$120.00
Zinc V Belt Pulley	\$17.43	- 2	\$34.86
Nulon Idler Pulley with Ball Bearing	\$12.10	2	\$31.00
Tonsionar Arm Machining	\$200.00		\$20,00
Music Wire Stell Tension Spring	\$300.00	1	\$500.00 ¢F 10
	\$3.19	1	\$3.17
Button Head Hex Drive Screw	\$9.37	1	\$9.37
Tension_Pulley_Spacer	\$2.85	1	\$2.85
Dowel Pin	\$7.55	1	\$7.55
Front Emrrax Base Mount	\$20.03	1	\$20.03
Ermax Mount Base Top Bar	\$4.55	1	\$4.55
Emrax Mount Base Side	\$12.75	1	\$12.75
Ermax Mount Base Top Support	\$20.03	1	\$20.03
Tensioner Pivot Plate Material	\$6.85	1	\$6.85
Tensioner Pivot Plate Machining	\$180.00	1	\$180.00
Impact Attenuator Foam	\$170.00	1	\$170.00
Impact Attenuator Base Material	\$49.65	1	\$49.65
Impact Attenuator Base Machining (IIIIIC machine shop)	\$180.00	- 1	\$180.00
Dimemometer Mounting, material + machining	\$200.00	1	\$100.00
Dynamometer Mounting, material + matiming	\$300.00	1	\$300.00
R&D MFD Magnets	\$130.00	1	\$150.00
Estimated shipping costs of all above parts	\$200.00	1	\$200.00
		Subtotal	\$8,661.34
Project Budget per F&S			
· · · ·			\$0.00
			\$0.00
		Subtotal	\$0.00
		Subtotal	ç0.00
Consul Supplies & Other			
General Supplies & Other			40
			\$0.00
			\$0.00
		Subtotal	\$0.00
		-	

TOTAL BUDGET

\$8,661.34