STUDENT SUSTAINABILITY COMMITTEE

Funding Application – Step II

Funding Criteria

A. General Rules

1. Students, faculty, and staff are encouraged to submit requests for funding. Student-led projects require a faculty or staff sponsor in order to have funds awarded.
2. Funding can only go to university-affiliated projects from students, faculty, staff, and departments.
3. All SSC projects must make a substantial impact on students. This may be a direct impact or an impact through education and engagement. All SSC funding is 100% from student green fees, so the projects funded by the students must benefit them.
4. SSC encourages innovation and new technologies – creative projects are encouraged to apply.
5. Unless a type of expense is specifically listed below as having restrictions, SSC can generally fund it. The items referenced below should not be taken as a comprehensive list.

B. Things SSC Can Fund, On A Case-By-Case Basis

1. SSC can fund feasibility studies and design work; however, it must work toward ultimately addressing a sustainability need on campus.
2. SSC can fund staff positions that are related to improving campus sustainability. Strong preference will be given to proposals receiving matching funding from departments and/or plans for maintaining continuity of the position after the end of the initial grant.
3. SSC can fund outreach events with a central theme of sustainability, provided their primary audience is the general campus community.
4. SSC discourages funding requests for food and prizes but will consider proposals on a case by case basis that prove significant reasoning.
5. SSC can fund repairs and improvements to existing building systems as long as it works toward the goal of improving campus sustainability; however, a preference is shown to projects utilizing new or innovative ideas.
6. SSC can provide departments with loans for projects with a distinct payback on a case by case base. Loans will require a separate memorandum of understanding between SSC and departmental leadership pledging to repay the award in full and detailing the payback plan.

C. Things SSC Will Not Fund:

1. SSC will not fund projects with a primary end goal of generating revenue for non-University entities.
2. SSC will not fund personal lodging, food, beverage, and other travel expenses.
3. SSC will not fund any travel expenses.
4. SSC will not fund tuition or other forms of personal financial assistance for students beyond standard student employee wages.

Your Step 2 funding application should include this application, the supplemental budget form, and any letters of support.

Please submit this completed application and any relevant 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 the Student Sustainability Committee at sustainability-committee@illinois.edu.

General & Contact Information

Project Name: Illini Hyperloop
Total Amount Requested from SSC: $10,000

Project Topic Areas: ☐ Land & Water ☐ Education ☐ Energy
☒ Transportation ☐ Food & Waste

Applicant Name: Ashley Rayan
Campus Affiliation (Unit/Department or RSO/Organization): Illini Hyperloop
Email Address: amrayan2@illinois.edu

Check one:

☐ This project is solely my own ***OR***

☒ This project is proposed on behalf of (name of student org., campus dept., etc.): Illini Hyperloop

Project Team Members

Name	Department	Email
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Student-Led Projects (Mandatory):

Name of Faculty or Staff Project Advisor: Blake Johnson

Advisor's Email Address: bejohnso@illinois.edu

Financial Contact ***(Must be a full-time University of Illinois staff member)***

Contact Name: Blake Johnson

Unit/Department: Mechanical Engineering

Email Address: bejohnso@illinois.edu

Project Information

Please review the proposal materials and online content carefully. It is highly recommended you visit a working group meeting sometime during the proposal submission process.

Please provide a brief background of the project, its goals, and the desired outcomes:

"Hyperloop" is a proposed mass transportation method originally theorized by Elon Musk. The system involves a high-speed train, or "pod," inside of a vacuum tube. In theory, a full-scale design could see pods traveling at speeds up to 700 MPH, making it ideal for inter-city transportation normally taking up to six hours by car.

The Hyperloop can accomplish this while consuming very little energy. The pods encounter minimal air resistance, and further reduce friction via magnetic levitation. Additionally, the roof of a Hyperloop tube can naturally incorporate solar panels and could potentially serve as a self-sustaining system as the vehicle itself is fully electric.

Illini Hyperloop is one of 21 competition teams globally to be accepted to build a pod for the SpaceX Hyperloop Pod Competition. Elon Musk's SpaceX has built a mile-long, six feet in diameter Hyperloop tube, which can support a near-vacuum (5% of Earth's atmosphere). Student-led teams from around the world enter this competition to race their vehicle. This is the fourth Hyperloop Pod Competition, and the team hopes to successfully complete construction of their vehicle, ship it to California, and race it down the track.

Illini Hyperloop is joined in a coalition with two other universities, together called Midwest Hyperloop (see "stake" section for more details). **Illini Hyperloop as successfully made it into the competition. Please note this is an update from our earlier SSC application**. We are one of 21 teams that will be competing at SpaceX headquarters this year. Please visit https://www.spacex.com/hyperloop for a full list of all the teams

With many students driving or taking buses to and from campus, a Hyperloop could potentially provide a quick, relatively inexpensive, and energy-efficient mode of public transportation. It could additionally link Champaign to major cities such as Chicago and St. Louis.

Where will the project be located? Are special permissions required for this project site?

The project is located in a dedicated space within the Nuclear Engineering Laboratory, specifically room 106B. Special permission is not required for this space, and it has been used by the project for about three years.

A Dynamometer located in the Department of Agriculture and Biological Engineering will also be used, at the permission and supervision of Professor Alan Hansen. Special permission is not required for this space.

Other than the project team, who will have a stake in the project? Please list other individuals, groups, or departments affiliated directly or indirectly by the project. This includes any entity providing funding (immediate, future, ongoing, matching, in-kind, etc.) and any entities that benefit from this project.

Engineering Design Council has supported with a matching donation of $3,000.

Illini Hyperloop is working in collaboration with two student-led Hyperloop teams, from the University of Cincinnati and Purdue University. Together, we are competing as Midwest Hyperloop. We have been collaborating on the design of the vehicle with each team taking different responsibilities. For example, Illini

Hyperloop is responsible for the high-voltage power electronics (battery, motor controller, and motor), mechanical drive train, and part of the avionics system. Each team is responsible for fundraising and finding sponsorships for their own sections of the vehicle.

Additionally, we have secured sponsorship from Ansys in the form of software, valued at $17,600 and sponsorship from Ewert Energy in the form of a battery management system valued at $1,350.

How will this project involve and/or benefit students?

Our project is completely student-executed and is led by undergraduate students, with some graduate-level involvement. There are currently 33 students on the team from across many majors. Students get hands-on experience designing and then creating an incredibly complex vehicle, as well as practical experience on the business and promotion side. They are also provided with the opportunity to utilize skills they have learned in classes for a real-life application.

Annually, Illini Hyperloop presents our pod and demonstrates our magnetic propulsion technology during Engineering Open House (EOH), allowing students of all ages and disciplines to learn more about Hyperloop.

- 2019 EOH: https://twitter.com/IlliniHyperloop/status/1104073124574842880
- 2018 EOH: https://twitter.com/IlliniHyperloop/status/972210960860577792
- 2018 EOH: https://youtu.be/3KJmg9YMg38
- 2017 EOH: https://twitter.com/IlliniHyperloop/status/840267038643884032

In terms of indirect impact, the Hyperloop system could one day be viably implemented to connect Champaign to Chicago or St. Louis. This could allow for fast, safe and environmentally-friendly public transportation for future students.

How will you bring awareness and publicize the project on campus? In addition to SSC, where will information about this project be reported?

The project will be showcased during Engineering Open House as well as at SpaceX Headquarters during the Hyperloop competition in August. We will continue the project by recruiting more students during Quad Day and E-Night. Additionally, we will continue to publicize the project through our website and our social media accounts. On occasion, we may reach out to local news outlets such as the Daily Illini to publish major updates.

- Quad Day 2018: https://twitter.com/IlliniHyperloop/status/1033808172375597056
- E-Night 2017: https://twitter.com/IlliniHyperloop/status/903006217706102784
- http://illinihyperloop.org/
- https://www.facebook.com/UIUCHyperloop/
- https://twitter.com/illinihyperloop

Financial Information

In addition to the below questions, please submit the supplemental budget spreadsheet available on the Student Sustainability Committee website. Submission of both documents by the submission deadline is required for consideration of your project.

Have you applied for funding from SSC before? If so, for what project?

The previous Team Captain of Illini Hyperloop applied for funding in Fall 2016. This year we believe that we have a much stronger team and pod design, and we have successfully made it into the competition.

If this project is implemented, will you require any ongoing funding required? What is the strategy for supporting the project in order to cover replacement, operation, or renewal costs?

If the project is funded by the SSC, we will not need further funding for this specific pod beyond this year. After racing the pod at the SpaceX competition, it will not require replacement, operation, or renewal costs. Additionally, any amount of funding that the SCC could provide us with would be appreciated. We would gladly accept less than the $10,000 that we have requested.

Please include any other obtained sources of funding. Have you applied for funding elsewhere?

Engineering Design Council has matched $3,000 of our funding. Additionally, we have a software sponsorship from Ansys valued at about $17,600 and from Ewert Energy in the form of a battery management system valued at $1,350.

Environmental, Economic, and Awareness Impacts

How will the project improve environmental sustainability at the Urbana-Champaign campus? If applicable, how does this project fit within any of the Illinois Climate Action Plan (iCAP) goals?

Considering how many students drive or take buses to and from campus, the Hyperloop system could potentially provide an inexpensive, environmentally-friendly, and fast mode of transportation for students coming from major cities. Long-term, the Hyperloop system could eventually be adapted for more local transportation in the Champaign-Urbana area. This falls under the "transportation" category of the iCAP plan, specifically in encouraging train travel for business trips. Hyperloop would be able to provide another efficient mode of transportation similar to the Amtrak, but would be much faster.

How will you monitor and evaluate the project's progress and environmental outcomes? What short-term and long-term environmental impacts do you expect?
Some examples include carbon emissions, water conservation, green behavior, and reduced landfill waste.

We will monitor short term progress through regular meetings with our faculty advisor to ensure vehicle production stays on track. If Hyperloop technology is adopted it could have a significant and positive long-term environmental impact as Hyperloop would be a fully electrric system that could compete with planes therefore reducing the total amount of fuel the air travel industry uses.

What are your specific outreach goals? How will this project inspire change at UIUC?

Our pod is the first step towards an exciting, high-speed technology of tomorrow. We hope that, in the future, the Hyperloop transportation system could have a positive environmental impact. We also hope that this project can help spark a love among the UIUC community for efficient, sustainable transportation. We will maintain our social media pages as well as give interviews to the press when applicable. The SpaceX competition itself is a highly publicized event that often receives national news coverage from multiple outlets.

If applicable, how does this project impact environmental injustice or social injustice?
N/A