STUDENT SUSTAINABILITY COMMITTEE

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 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: Aluminum Tensegrity Shelter at Bike Parking Area at Newmark Civil Building

Total Amount Requested from SSC: $12,000

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

Applicant Name: Ann Sychterz
Campus Affiliation (Unit/Department or RSO/Organization): Civil and Environmental Engineering
Email Address: asychter@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.):

Project Team Members

Name	Department	Email
Heather Gathman	CEE	Hfg2@illinois.edu
Nishant Garg	CEE	nishantg@illinois.edu
Ravi Sharma	CEE	Ravis4@illinois.edu
Name	Department/Organization	Email Address

Student-Led Projects (Mandatory):
Name of Faculty or Staff Project Advisor:
Advisor's Email Address:

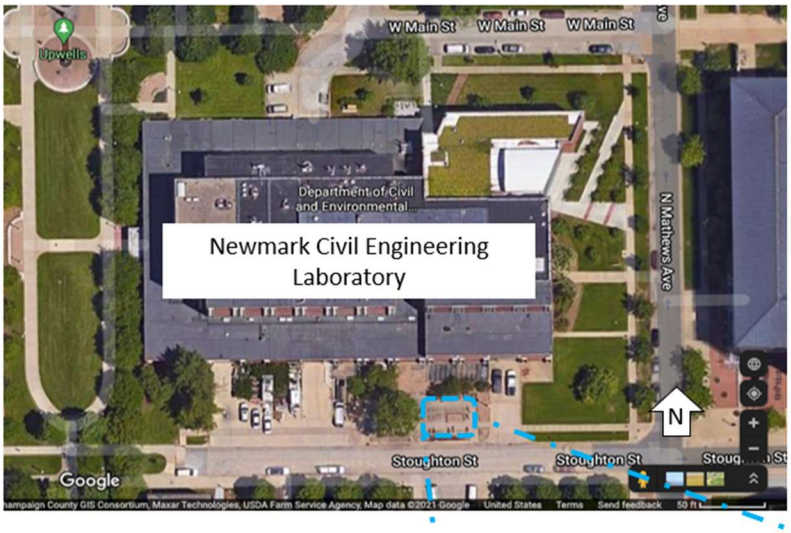
Financial Contact *(Must be a full-time University of Illinois staff member)*
Contact Name: Brian Pianfetti
Unit/Department: CEE
Email Address: bpianfet@illinois.edu

Project Information

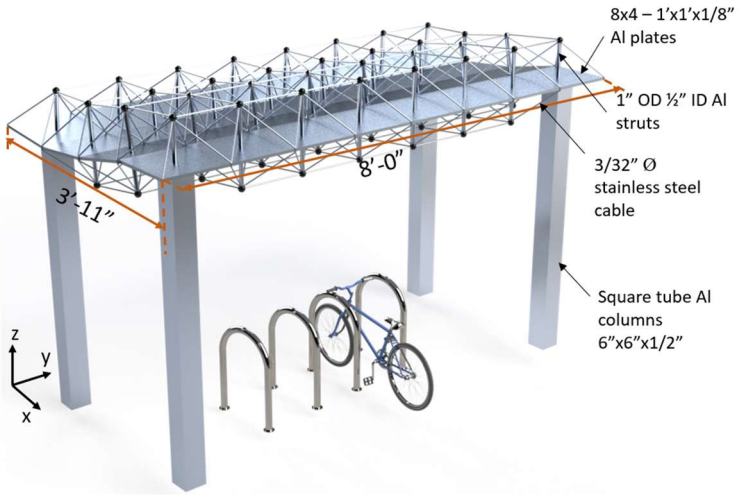
Please review the proposal materials and online content carefully. It is highly recommended you visit a working group meeting sometime during the proposal submission process.

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

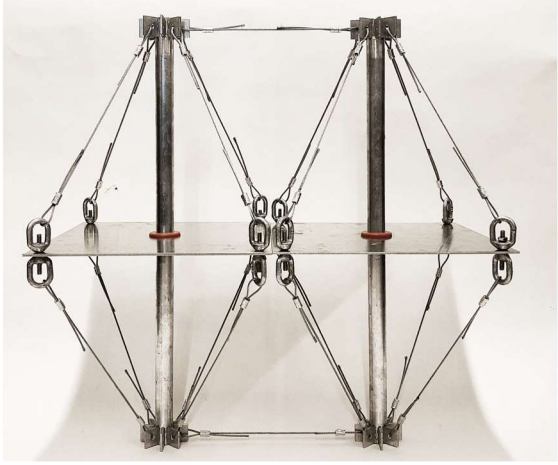
Project Description: The goal of this work is for students to gain awareness of new sustainable infrastructure through the build of a light-weight and compliant tensegrity structure as a bicycle parking canopy. Currently, there is only a sheltered bicycle parking at Chem Life Sciences on the University of Illinois campus with another canopy planned near Flagg Hall. Both these locations are south of Green St. and far from the Engineering Quad. Sheltered bicycle parking would encourage more commuters to choose to ride to work instead of riding if their bicycle is protected from precipitation and corrosion. Bicycle parking canopies are cantilever structures subjected to primarily rain, snow, and wind loads. An example of an adaptive system is a tensegrity structure, composed of bars and cables that are held in a state of self-stress. Aluminum is a light-weight material that can easily be formed for bar elements of a large-scale structure. The structural drawings have been submitted to Jim Pawlikowski, licensed professional engineer in the state of Illinois for approval. The funds requested reflect the needs beyond the gracious seed funding from iSEE Campus as a Living Lab for the assembly and erection of the aluminum bike parking canopy. Four hourly undergraduate students will be engaged to help build the modules at $15/hour with 20 hours each. The aluminum columns, base plates and welding will cost $8000. The time for facilities and services to install anchors into the sidewalk concrete and help erect the canopy is budgeted at $100/hr with a projected three days of effort. Three wireless accelerometers, at $900 each will also be purchased. The total projected budget for the remainder of this project that promotes sustainability on campus is approximately $14,000. For cost share, the team proposes a cost share and requests $12,000 for this proposal, with the remainder and overages covered by the team. Environmental Impact: Through the study and performance assessment of this light-weight, highly-



Proposed bike parking canopy location



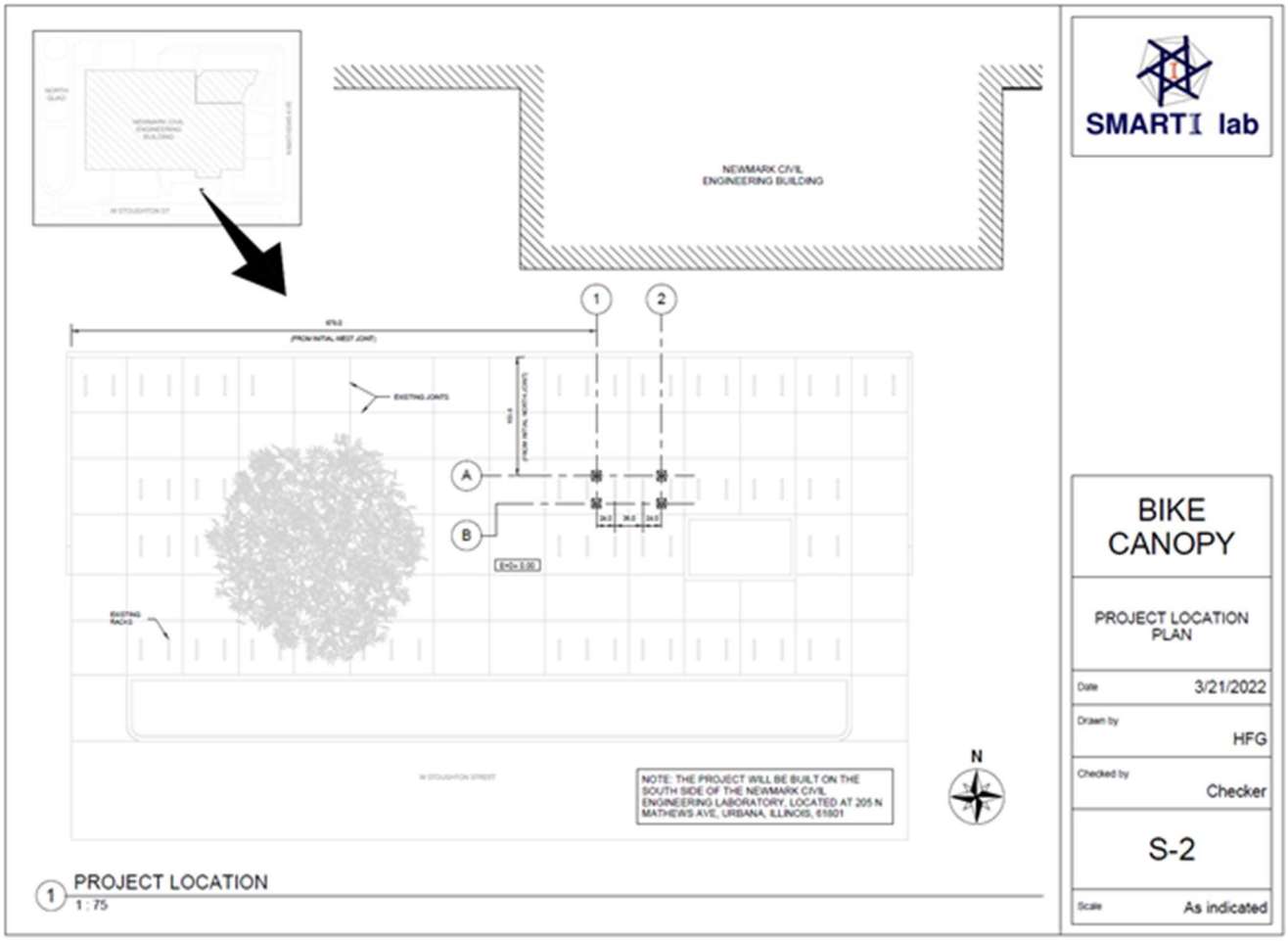
recyclable material bicycle canopy, this project is a the real-life motivation for the fundamental scientific proposal through external funding.



This aim of this project is to show feasibility of building compliant light-weight tensegrity structures while supporting a sustainable method of commuting to campus through cycling, which is in support of iCAP initiatives (transportation, education). Lightweight structures reduce the raw materials needed for design andaluminum is nearly infinitely recyclable compared with steel or concrete. This modular system also requires no machinery for assembly of the roof, only a forklift to raise the canopy on its columns at the end of construction, reducing emissions.

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

The team has engaged with UIUC Facilities and Services via Stacey DeLorenzo (support letter attached) to install the bike parking canopy in the bike parking area on the south side of the Newmark Civil Engineering Building at 205 N Mathews Ave. Facilities and Services has been consulted for the past two years for this bike parking canopy and are in agreement provided the engineering drawings are stamped by a professional structural engineering in the state of Illinois. The team has engaged Jim Pawlikowski, PE, SE, LEED AP, a UIUC alumni, adjunct faculty in CEE and chair in the School of Architecture to review the drawings. Support letters attached by Stacey DeLorenzo from UIUC Facilities and Services and Jim Pawlikowski from REX Engineering.



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.

The Institute for Sustainability, Energy, and Environment procured the seed funding for this project and therefore would be supportive to see this project coming to fruition on the University of Illinois Urbana-Champaign campus as a living lab. No other sources of funding outside of the lead-PI startup funds are ongoing or projected, therefore financial assistance through this SSC application would be very beneficial to the success of this bike parking canopy.

How will this project involve and/or benefit students?

In the build process, our team which includes two masters students, Heather Gathman and Ravi Sharma, need to engage the help of several undergraduate students (including current student Christina Garcia) for the successful assembly of the aluminum tensegrity modules of the canopy. Once erected at the Newmark bike parking area, students biking into campus will benefit from the shelter it will provide during

inclement weather. Lastly, the accelerometers that will be installed on the aluminum canopy will collect measurements that will be used to understand structural systems in both the undergraduate CEE 465 Design of Structural Systems course and a new graduate course on advanced structural systems that will discuss adaptive structures. The location of the bike parking canopy is also a highly trafficked area near Newmark as it connects the Engineering Quad to Uni High, the Digital Computer Lab, the Department of Computer Science and the National Center for Supercomputing Applications.

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

A custom 3D-printed placard will be custom built to be mounted on the column of the bike parking canopy to thank the financial contributors for this canopy, including iSEE and SSC if this proposal is chosen. Being that the aluminum tensegrity bike parking canopy is in a highly trafficked area, this signage to acknowledge the financial contributions will be viewed often by faculty, students, and users of the bike parking area on the south side of Newmark Civil Engineering Building.

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?

No SSC funding has been previously applied for.

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?

The intention of this funding application is for a one-time amount for materials and cost of final installation of the aluminum bike parking canopy. No further funding for this project is expected for replacement, operation, or renewal.

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

The project was funded by seed money from the Institute of Sustainability Energy and Environment, no other funding outside of the lead PI's startup fund have been supplied to the project. The research following the installation of this aluminum tensegrity canopy to study vibrations and dynamic behavior has been submitted to the National Science Foundation to address the fundamental science (funding not available for canopy and assembly).

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?
This aim of this project is to show feasibility of building compliant light-weight tensegrity structures while supporting a sustainable method of commuting to campus through cycling, which is in support of iCAP initiatives (transportation, education).

How will you monitor and evaluate the project's progress and environmental outcomes? What short-term and long-term environmental impacts do you expect?
The short-term impacts of this project are to provide the shelter that is desperately needed for current commuter cyclists that arrive to the Civil Engineering Building and the Engineering Quad area. The long-term environmental impact is to encourage more students and especially staff and faculty to choose cycling over driving since their bike will remain protected from the elements while they are at work.

What are your specific outreach goals? How will this project inspire change at UIUC?
The outreach goals of this project are to provide a respite from spring rains and winter snows for commuter cyclists parking in the engineering area of the campus. Currently no bike parking area has a covered shelter north of Green Street on the UIUC campus. Many students that live farther away and do not have the financial means to own a car and park on campus will choose to bike. Freezing rain, snow, and rain can damage bikes if left out all day and cause safety issues for travel. Motorists who commute to work have the luxury of several covered parking areas such as the structure on Goodwin and University Ave. The team has reached out to parking services and no plans for covered bike parking has been in the works at this building.

If applicable, how does this project impact environmental injustice or social injustice?
Following on the previous response, the infrastructure for housing vehicles (cars, bikes, motorcycles) should be equitable on campus to reflect the financial means of each UIUC citizen. To promote and encourage an environmentally positive mode of transportation, commuter cyclists are willing to brave the travel while exposed to the elements, dangerous potholed roads that can damage wheels, and lack of visibility to motorists.

STUDENT SUSTAINABILITY COMMITTEE
Step II Application

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:	Aluminum Tensegrity Shelter at Bike Parking Area at Newmark Civil Building	
Total Amount Requested from SSC:	$12,000.00	
Amount Requested as:	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

Task	Timeframe (# of weeks to completion)	Estimated Completion Date
Complete aluminum tensegrity canopy	12	9/1/2022
Weld base plates to column footings	6	10/15/2022
Install concrete anchors on bike parking area sidewalk	3	10/15/2022
Raise canopy and connect to top of columns	4	11/5/2022
Transport canopy outside and install in place	1	11/15/2022

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

Item	Cost Per Item	Quantity	Total Request
Equipment & Construction Costs			
Aluminum 6061 6" HSS, 10 ft length	$2,640.00	4	$10,560.00
Aluminum 12" square base plate	$52.96	4	$211.84
Concrete anchors	$3.12	16	$49.92
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
		Subtotal	$10,821.76
Publicity & Communication			
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
		Subtotal	$0.00
Personnel & Wages			
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00

			$0.00
			$0.00
			$0.00
		Subtotal	$0.00

Project Budget per F&S

F&S hourly for help with final install	$100.00	12	$1,178.24
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
		Subtotal	$1,178.24

General Supplies & Other

			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
			$0.00
		Subtotal	$0.00

TOTAL BUDGET	**$12,000.00**

End of Application

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

Facilities & Services
Physical Plant Service Building, MC-800
1501 S. Oak St.
Champaign, IL 61820-6905

April 25, 2022

Student Sustainability Committee
University of Illinois Urbana-Champaign
Urbana, IL 61801

Dear Student Sustainability Committee,

I write on behalf of Facilities and Services (F&S) in support of the ***Bike Canopy*** project at the bike parking area south of Newmark Civil Engineering Laboratory, requesting **$12,000** in funding as submitted by Dr. Ann Sychterz. We have been working with Dr. Sychterz and Dr. Nishant Garg from the Civil and Environmental Engineering (CEE) department on the development of this project since 2020. This project is about students/researchers testing a new type of structure for potential uses. We support the academic research and use of our campus as a testing site. The bike canopy will be installed by F&S and Dr. Sychterz group.

The goal of this project is to provide temporary covered bike parking to the students, faculty, and staff at the Newmark Civil Engineering Laboratory. This project will also help with the University's Bike Friendly University status. We support the implementation of this project, pending design and drawing approval by a licensed structural engineer.

On behalf of F&S, thank you for your consideration of this grant application to improve active transportation at the University of Illinois Urbana-Champaign.

Stacey DeLorenzo

Stacey DeLorenzo
Transportation Systems Manager
Facilities & Services

REX Engineering Group

280 Shuman Blvd, Suite 108
Naperville, IL 60563

www.rexeg.com

April 25, 2022

University of Illinois at Urbana-Champaign
Student Sustainability Committee, Transportation and Infrastructure Working Group

Re: Aluminum Tensegrity Shelter at Bike Parking Area at Newmark Civil Building

This letter is to confirm that I have agreed to review drawings for the above mentioned Tensegrity Shelter, led by Prof. Ann Sychterz. I have discussed the project with Prof. Sychterz, and understand the design and criteria. I confirm that I am a licensed structural engineer in the State of Illinois (SE), and have experience with structures and efforts similar to this.

Sincerely,

James Pawlikowski, SE, LEEP AP
Principal / Director of Engineering
REX Engineering Group