



ENG 573

Student Sustainability Committee Proposal

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Piezoelectric walkway to power campus LEDs

- ❖ Currently, the British company Pavegen develops tiles that can power LEDs
- ❖ To optimize efficiency and the visibility of the walkway, it can be installed at the entrance of a prominent university building (including the ARC, the UGL and Grainger library), bookstores or along the paths of the Quad, etc
- ❖ This will include installing multi-colored LED lamps that use the human-induced energy



Current Specs of the V3 devices by Pavegen

- ❖ The price is approximately 75\$ to \$160 per ft² depending on the project (Pavegen claims the price is significantly less with the newest technology)
- ❖ In Washington DC, 240 ft² of Pavegen tech cost \$200,000 for total installation cost (\$833 per ft²)
- ❖ Power rating is 5W continuous power
- ❖ Voltage of 48V
- ❖ The tiles are made from steel, recycled aluminum, and composites
- ❖ Can be used in temporary or permanent installations
- ❖ 0 electricity cost and students will see them each and every day!

Imagine the Quad filled with human powered LED lamps on posts

Image taken from <http://uihistories.library.illinois.edu>



A “step” in the right direction!

- ❖ This before and after transition shows the potential if implemented on the Quad
- ❖ 40W LED = 450 lumen or the light of 450 candles
- ❖ However due to budget constraints, this is too expensive
- ❖ The proposed installation will be in front of the Union Bookstore with a few important components
 1. Piezoelectric tiles under the awning
 2. Different colored LEDs that light the corner up
 3. A poster explaining the science behind the energy



A video of the permanent installation in D.C.

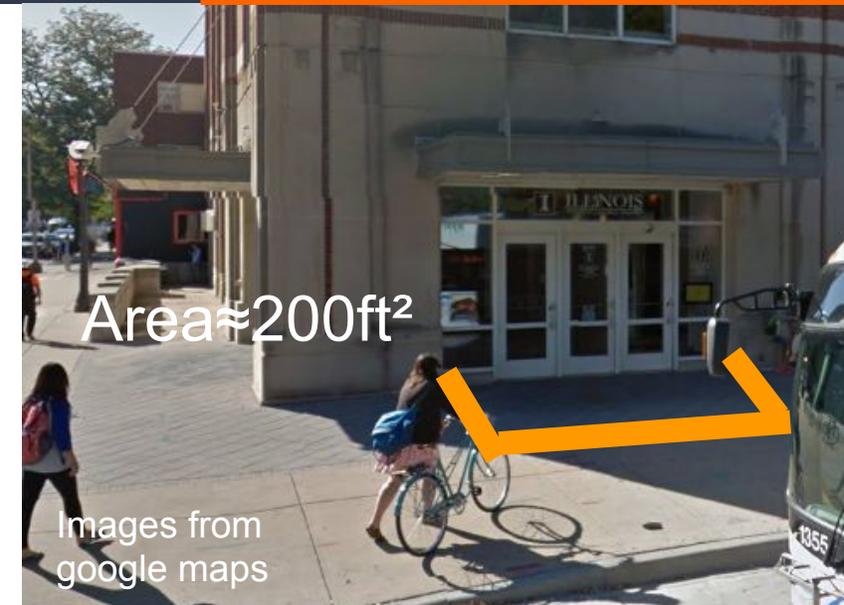


- ❖ Installation was completed on November 18th, 2016
- ❖ 68 Tiles were needed during the installation
- ❖ Surrounding LED lamps are being powered by the commuters

Install the tiles and LEDs outside of the Union Bookstore



- ❖ Prime location where many students congregate due to the bookstore, Starbucks, and bus stop
- ❖ It is sheltered from above due to the awning (in addition to the tiles being durable)
- ❖ Lighting up this corner of the street is imperative due to the bus, bike, and pedestrian traffic



- ❖ Future applications of the energy include powering the bus terminal notifier, as well as being implemented at the other bus stop
- ❖ The unit area in front of the bookstore wanted is close to 200 ft², which if using the cost per area given earlier, total material cost is \$15,000-\$32,000
- ❖ If enough funds are available, both sets of doorways netting a total area of close to 400ft² can be used. Total material cost of about \$30,000-\$64,000
- ❖ We could also use the total cost of the D.C. project and scale down the area to our area of 200ft², which results in a total cost of \$200,000 (possibly too high of an estimate due to outdated costs from years ago)

In conclusion

This fairly recent technological advancement can help **educate** students on renewable sources of energy like wind, solar, and human-kinetic energy

The display is highly **visible** to all students on their daily travels on campus, and can also be a social media hub

It can also be a point of emphasis to visiting scholars and prospective students

The lighting generated leaves zero carbon footprint

If successful the project can be upscaled in order to generate much greater energy and for other uses like charging stations.