Light-Up Crosswalk Prototype Phase 1

Janie Bube, Master of Landscape Architecture
Emilia Cabeza de Baca, Master of Architecture
Arman Rahimzamani, PhD in Electrical Engineering
Martha Hart, Masters of Urban Planning

TABLE OF CONTENTS

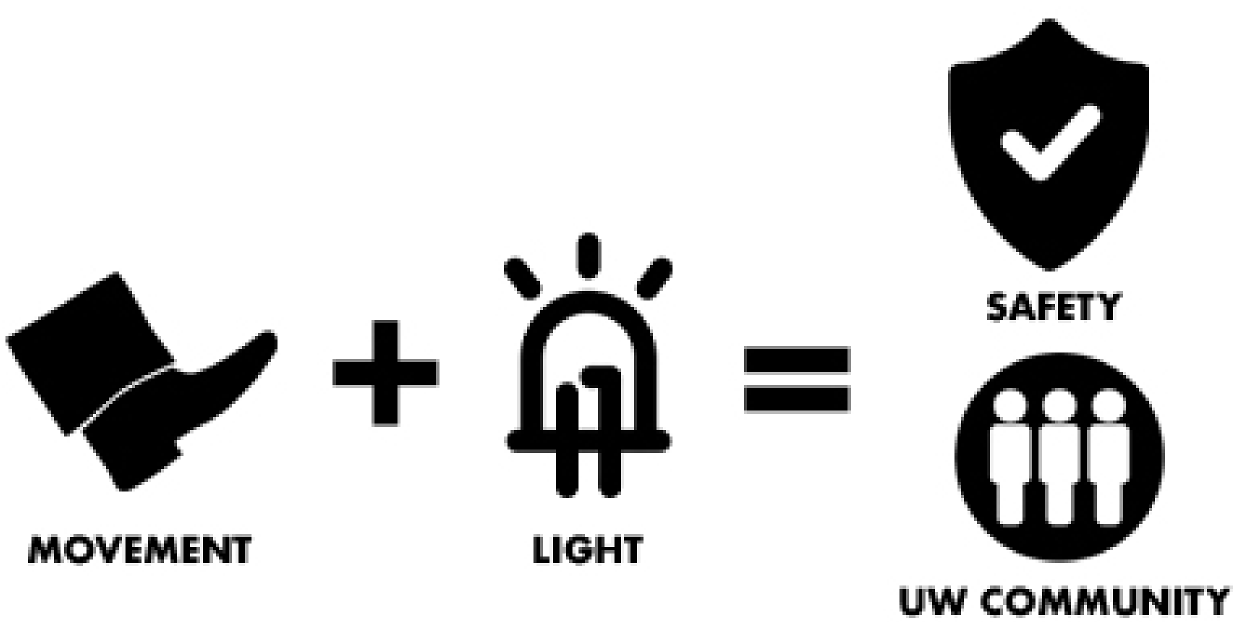
Imagine you are a student, it's a dark and damp rainy Seattle night...you are tired from studying all week and are hurrying to get home. You step out into an ordinary crosswalk at the corner of a sharp bend in the road. A car swerves to avoid you, as you are nearly invisible in the darkness. This story and many like it show the importance and necessity of safer crosswalks. Our project idea stems from this need and desire to make commuting by foot, bike, bus, or car as safe as possible.

EXECUTIVE SUMMARY

This project draws on interdisciplinary expertise and creativity in developing luminaire speed bumps powered by solar energy to sustainably and innovatively improve safety at the University of Washington (UW) Seattle Campus. Ultimately, we want to implement the highest performing prototype to the most trafficked, least illuminated paths on campus to keep students, faculty, and staff safe. Addressing the UW's Campus Landscape Framework objective of creating connections across the "mosaic" of the Central Campus, this prototype will improve circulation through an iconic landscape, create a unique experience, increase safety, and create opportunities for collaboration between students and industry partners.

A hybrid solar system, meaning a system that can be both off-grid and grid-tied depending on conditions and need, will be used to power luminaires embedded in a temporary, modular speed bump. This reliably improves safety and visibility without permanently changing roadways. The modular configuration also facilitates maintenance and flexibility.

These speed bumps would be located at different points of the Burke Gilman trail so when feet, wheelchairs, or bicycles pass over them a sensor will be triggered and spot illumination will be delivered almost instantly. The greatest load to pass over these speed bumps will be small campus vehicles, materials will be selected based on their load carrying capacity.



PRECEDENTS

Umbrellium + Direct Line, UK

-22 meters of responsive surface, embedded under a normal road

-Substructure made of steel that is bolted together, then LEDs covered in high-impact plastic so they can support the weight of vehicles and avoid water damage

-Once embedded in the road, two cameras are installed to film the street from opposite ends machine learning technology to respond to people and insidents and promptly change the traffic situations

-When the crossing isn't needed, it vanishes

-More people crossing, the wider the crosswalk gets, moves the stop line and cyclist area back in prototype stage in a studio in West London, as of 2017

LumiStar Wireless + Solar In-Roadway Light (IRWL), USA

-Stainless steel, 17-4 alloy

-Exceeds HS-20 Wheel Load Testing

-Endures extreme weather cycles

-5 year warranty, 10 year life expectancy

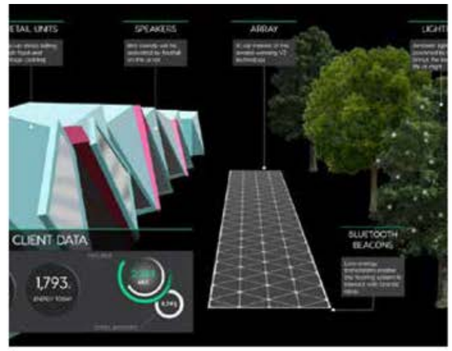
-Visible from 3,000 feet in bright sunny conditions

-Emits over 4 million cd/meter squared Solar powered

-Lasts up to 60 days with no sun

-Only requires an average of 4 hours of sun per day

-Easy installation (no saw cutting or trenching, no service cabinets or large solar panels, no conduit, no electrical license)



PaveGen, London

-Paving slabs that convert energy from people's footsteps into electricity

-Recycled rubber paving slabs harvest kinetic energy from the impact of people stepping on them, giving instant busts of electricity to nearby appliances

-Can store energy for up to 3 days in an on-board battery

-Info on precise technology not shared Contains a low-energy LED which light up Success will be determined how cost-effective it is to produce for its far-reaching efforts

-Issues is cost!

-Sounds like it can handle pedestrians, but it says nothing about cars or buses

Image: MCA Denver Rooftop skylight/walkway (Left: View of the glass walkway illuminated from below at dusk, courtesy of Davis Partnership Architects; Right: Surface detail of glazing, courtesy of https://hiveminer.com/Tags/davidadjaye%2Cwood/Recent)

DESIGN

How does our design differ from the precedents? Our proposed system is adaptable, low-impact and doesn’t require intensive, costly street redesign like similar products from Umbrellium or PaveGen. LumiStars IRWL utilizes blinking lights, which pose threats for individuals with seizure disorders.

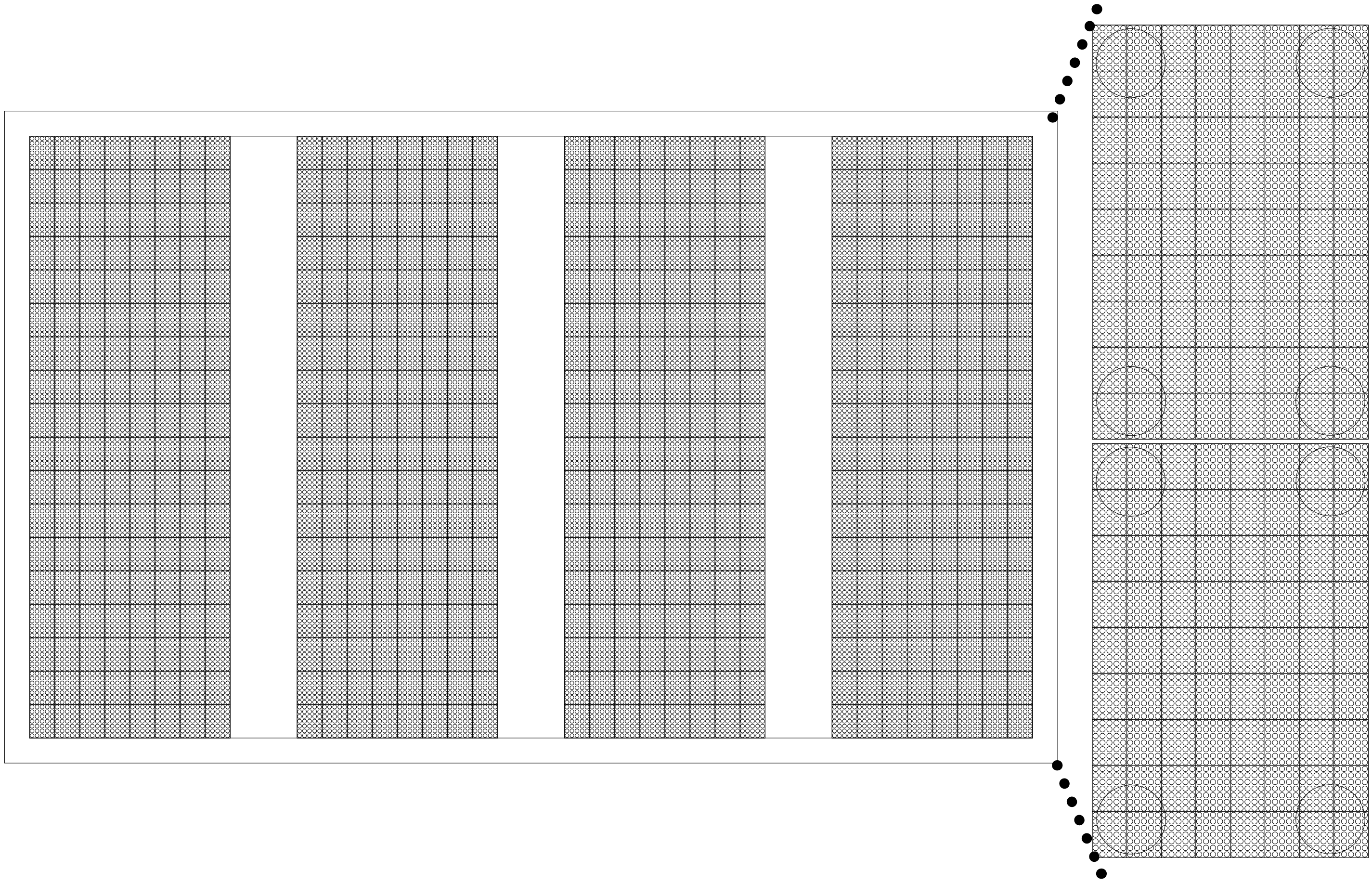
The prototype will be 5’ in length (direction along which someone walks) by 3’ wide by approximately 5” deep. The prototype is modular, so different sections can come out without disturbing the integrity of the system and without costing large sums of money. The module LEDs are 1’ in length by 1.5’ width panels with 5 by 7 arrays, totaling 144 arrays and 5,040 individual LED lights per strip (x4, totaling 20,160 lights for the whole panel).

Each one of these panels sits above 4 load cells near the corners of the strip platform to ensure complete coverage of a person’s foot. Each strip consists of two 1’ length by 1.5’ width side by side to cover a 1’ long by 3’ wide strip across the whole prototype.

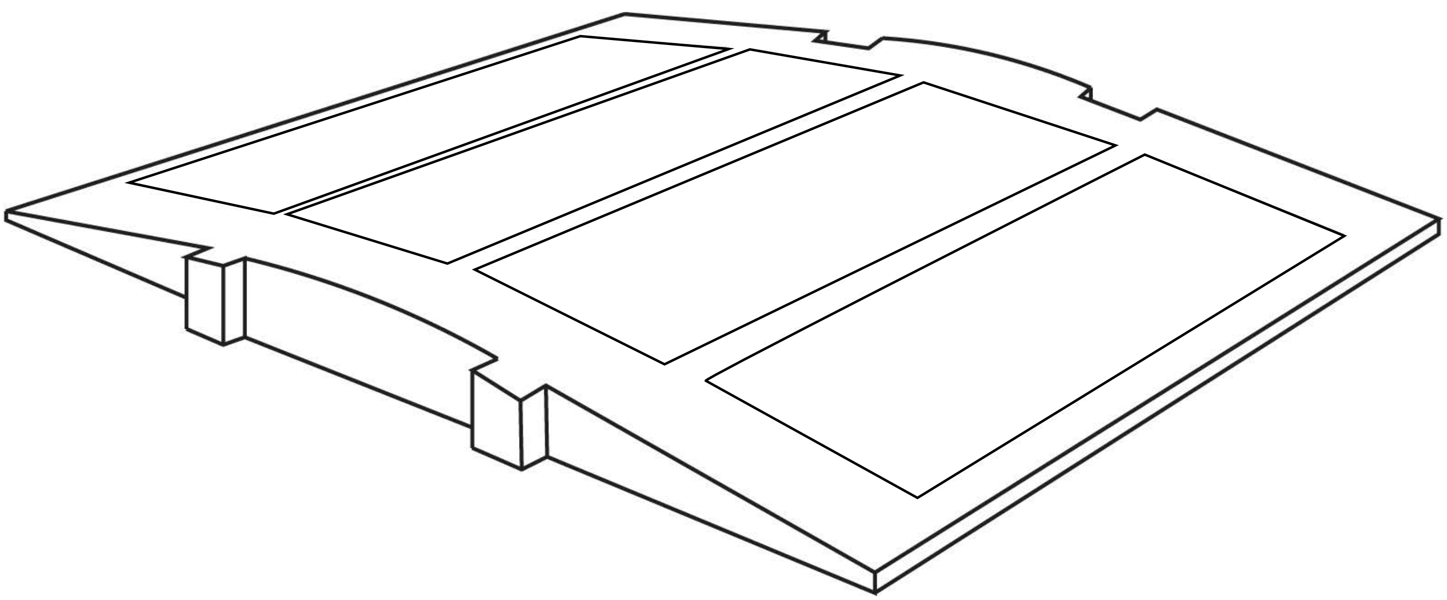
Within each strip, either side of the strip can be activated by weight, the control panel computer will light up all 144 arrays. We made the gap between each strip to be 4” to allow for a foot to activate the strip regardless how or where a person steps. So it looks like: walking across 1’ is a strip, then a 4” gap, another 1’ strip, totaling 4 strips, and 32 load cells.

The brightness levels will need to be played with to find the optimal brightness for different levels of darkness. The angle of the light will also need to be tweaked and worked with to address both up close pedestrians, bikers, and cars and farther away of the previously mentioned.

DESIGN COMPONENTS

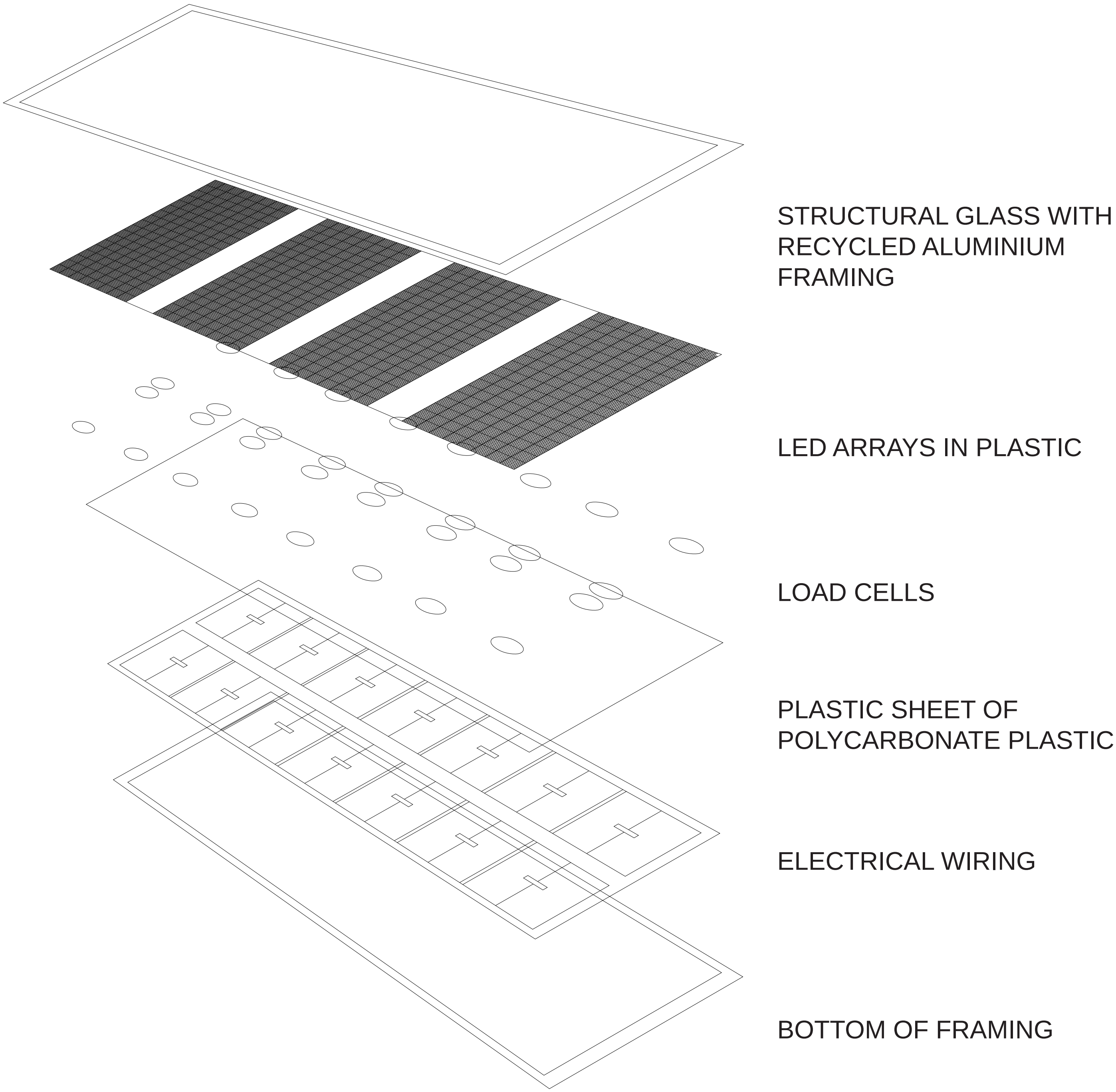


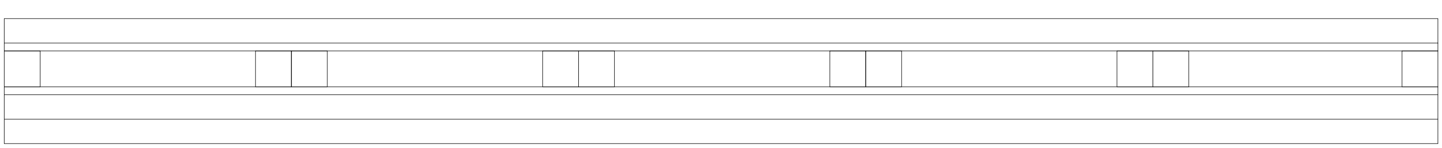
UPPER LEFT: PLAN VIEW OF CROSSWALK WITH 4 STRIPS OF LED ARRAYS
UPPER RIGHT: ZOOMED PLAN VIEW OF 1 STRIP OF LED ARRAYS



ABOVE: SPEED BUMP CROSSWALK LED MODULE

Exploded Axon of Prototype Layers





ABOVE: SECITON OF LAYERED MATERIALS
(1” Structural Glass, 0.33” LED Arrays, 1.5” load cells, 0.33” plastic sheet, 1” electrical wiring, 1” bottom of frame, EQUALING 5.16”)

SUSTAINABLE IMPACT

The UW campus has some paths where students feel unsafe at night due to poor lighting. Furthermore, due to Seattle's weather and geographic location, it is often dark during key commuting hours. Campus safety for pedestrians is particularly important as many students, at UW and other colleges, choose walking as their primary mode of transit. Lack of safety in areas of high traffic, mixed-mode transportation can not only lead to physical injuries, but potentially a culture of distrust and fear detrimental to a sense of community or an atmosphere of solidarity.

From a broader perspective, implementing adequate lighting infrastructure can be difficult in marginalized, low income, or rural communities since the costs of streetlight hardware, connection to the grid, and maintenance are often prohibitive. The expense of car ownership leads more people to walk or bike across longer distances, making safe crosswalks even more vital. Additionally, electricity from the grid can come from non-renewable sources, such as coal or natural, and it can be difficult for a local community to find an option for their street lighting that is powered by renewable energy.

ADDRESSING SUSTAINABILITY

The utilization of LED technology results in greater longevity and energy efficiency, with less energy loss to heat, than other sources of light- providing adequate lighting for users without dramatically disrupting surrounding ecosystems. The lighting technology will harvest and store its own energy, releasing fewer greenhouse gases than coal-powered electric grids. The lighting system has the capability to rely on the grid in the event of solar power failure. The controller will need to rely on external power, which for the time being is grid-tied.

This prototype will also address the social/cultural sustainability aspects of road safety. Currently, the impacts of a night time accident are disproportionately higher for pedestrians than for drivers or cyclists. By creating better lighting at crosswalks, safety is improved in a more equitable fashion, regardless of transportation choice.

Accompanying this technology is the need for education and training on its maintenance and benefits. This would allow open dialogue and information exchange, empowering communities and allowing the technology to be culturally relevant.

Finally, while this project's focus is to increase safe mobility, it will do so while ensuring environmental safety. In selecting products and materials, we will make our best efforts to exclude “Red Listed” materials. The Red List was developed by the International Living Futures Institute and catalogues chemicals known to have hazardous effects on human, animal, and environmental health, e.g. lead, BPA, cadmium, mercury, etc. We will consider the potential for off-gassing, leaching, or leaking when we develop the component. Toxicity is a great concern to the project team, and safeguarding against it for all direct and indirect users is essential.

METRICS AND IMPACT MEASUREMENT

This project will make use of a tool that is often used in sustainability evaluation: triple bottom-line analysis. The project will be examined according to its environmental impacts, its social impacts, and its economic impacts.

The main environmental targets of this project included reducing GHGs through alternative energy; consequently, we would like to estimate the decrease in GHGs caused by switching from a conventionally powered electrical to the new technology as closely as possible using available research. The prototype will be evaluated to see its positive benefits.The average monthly energy usage will also be calculated along with the efficiency and life span of the prototypes. Another key environmental indicator that will be measured is light output (in lux). The light output will then be used to determine the extent to which the prototypes reduce light pollution and to ensure that the light provided is not overly disruptive of animal habitat.

For the second portion of the triple bottom line analysis, a number of social indicators will be examined. We hope to conduct a survey pre- and post- prototype installation to ask students how safe they feel at the test locations and which mode of transport they use. This survey will be useful in prototype refinement and in ensuring that pedestrians, bicyclists, and motorists all feel safe at the installation locations. We will also measure the number of accidents at the prototype sites to further evaluate safety, with a particular emphasis on pedestrians.

The economic impacts and economic sustainability of this project are vital, as the technology will hopefully be used both at UW, in Seattle, and in more marginalized communities. The costs to build and maintain the prototypes will be evaluated with an eye towards making the technology as cheap as possible while still maintaining quality and functionality.

EDUCATION AND OUTREACH

Behavior change: Providing luminous circulation and connection throughout the UW campus, regardless of weather conditions or damage to the grid, will likely help pedestrians feel more secure and independent, while cyclists and drivers will be alerted to movement around them.

Outreach: This project will provide the student team first-hand experience in product development, fabrication, and prototype testing (before proceeding down the implementation route). It will support the efforts of the university to improve the campus' experiential qualities; update, control, and maintain campus lighting; and ensuring that campus users feel safe. As a team we have done individual, department, and mass outreach (not only to find more students to participate on our team, but also to bring awareness to this new safety approach). We have sent out advertisements for more team members to the Graduate and Professional Student Senate (GPSS), Associated Students of the University of Washington (ASUW), the Mechanical Engineering Department, the Electrical Engineering Department, Applied Math Department, Civil Engineering Department, Construction Management Department, Computer Science Department, Materials Sciences Department, Architecture Department, Urban Planning: Transportation Planning, and the Landscape Architecture Department.

Education: Students will be exposed to unprecedented sustainable technology applications and the learning opportunities that come with its operation. Additionally, the larger UW community will act as a testing ground for revolutionary infrastructure. The system will need to be inspected and maintained, this too will provide data collection and technology optimization opportunities. This project also builds on the Campus Illumination Roadmap previously supported by Campus Sustainability Fund, and could be included in their research.

STUDENT INVOLVEMENT

We are advocating for student involvement at every point and every level of the project. It is a student run team that is designing for students. We are inclusive, always willing to include other disciplines and expertise. Additionally, we envision the long-term management and maintenance of this project to be conducted and funded by the work of a future student team. There is potential for this to be carried out in an interdisciplinary studio similar to the McKinnely Futures Studio offered by the College of Built Environments.

At this stage of the project, we are looking for undergraduates and graduates that are interested in the development and prototyping of the project (see outreach section above). Though, we are a team predominantly of graduate students and PhD students, we offer a unique opportunity for undergraduates. If we were to have interested undergraduates in the fields mentioned in the previous section on Outreach, we would offer a mentorship component to the project, especially if they are at the beginning of their university experience. We would then benefit from a fresh perspective and they from experience. We are hoping to foster relationships with UW Solar and Engineers Without Borders. In this way, we are truly inclusive.

In terms of affecting students, faculty, and staff at the University of Washington, as previously mentioned, this project will increase safety and awareness of pedestrians at crosswalks. This is a large issue with a large rippling effect of behavior change. We want our campus to be as safe as possible.

ACCOUNTABILITY AND FEASIBILITY

The project team would engage with the Office of the University Architect, the Campus Engineering and Operations Office, and UW Faculty from the College of Built Environments. There is also potential for engagement with Seattle City Light as well (though UW isn't required to have City approval because UW has power over its own road and traffic laws).

Originally we were hoping to utilize kinetic energy, but the technology at this point is cost-prohibited (need closer to $100,000 to create a prototype) and further investigation would be needed. However, we are still interested in the technology and if the Amazon Catalyst award is received, we will be looking at adding this technology.

Funding from CSF would be invested in developing a prototype with add-ons to our product. The project team would fabricate as many components as possible with the possibility of reaching out to local manufacturers for product donations. With any prototype process, we can plan, research, and prepare as much as possible, but we do need some room to tinker and try different possibilities, which is why consulting professionals and having complete support for prototyping from the Facilities Engineering Services and Chris Meek's Integrated Design Lab is imperative. We are also interested in developing a relationship with the Clean Energy Institute.

We have reached out to all the affected departments if the prototype were to be implemented and have received full support from several (for the April 15th deadline, still waiting to hear from some): UW Facilities (Norm Mentor)-have not received contact; UW Landscape Architecture (Kristine Kenney)-have not received contact; Environmental Health and Safety (Natalie Daranyi)-deliberating on approval; Campus Engineering Services (Joanna Pang, though Joe Cook will be our primary contact and advisor)-have received approval; UW Integrated Design Lab (Chris Meek)-have received approval; and CoMotion (Magali Eaton)-deliberating on approval.

We understand the complexity of this project in terms of building, road, environmental and safety codes, ADA compliance, electrical systems, etc. We also want to emphasize that this is a prototype with the potential for implementation down the road.

We also have the full support of the Landscape Architecture Department for contact and funds distribution.

Once approved, we will reach out to the Campus Design Review Board and the Grounds Improvement Advisory Committee to review design aesthetics, signage, and other concerns they may have.

Core Team Members
We are an unlikely group of masters and PhD students working together to improve a much needed area on the campus. We have greatly enjoyed working together. Each of us have learned much about cross-disciplinary work, time management, public speaking, pitching, engineering, codes, and budgeting. We think projects like ours, though complex with many stakeholders and important players, is cutting-edge and a great opportunity to work cross-campus to achieve a common goal.

Janie Bube, Master of Landscape Architecture
Emilia Cabeza de Baca, Master of Architecture
Arman Rahimzamani, PhD in Electrical Engineering
Martha Hart, Masters of Urban Planning

Consultants
Chris Meek of Integrated Design Lab (project partner)
Sadra Fardhosseini, PhD in Construction Management
Benjamin Chasnov, PhD Electrical Engineering
Facilities Engineering Services Department

Project Timeline

Task	Timeline
CSF Proposal Submitted	April 15th
CSF Award Notification	Late May
Procuring needed elements (including (to fostering connections and support local environmentally friendly vendors)	Completed once award notification, as late as late June
Start prototyping/creating in lab/troubleshooting	July to September
Testing	September to November (testing inside for controlled environments, outside for real weather elements and fairing, people and vehicular testing) (Work with Engineering Facilities to find their desired location to test on-site)
Analyze Results	November to January
Evaluate plausibility	Winter of 2020
Gather campus stakeholders, city stakeholders, companies, etc. for implementation	Spring of 2020

ADDRESSING DEPARTMENT CONCERNS

After speaking with the Facilities Engineering Services Department and the Environmental Health and Safety Department, these are the following concerns that they want us to address:

- Make sure that the prototype is compliant with ADA (addressing visual and physical needs)

  The prototype will have a low pitch that is ADA compliant, so that it does not impede people in wheelchairs or using canes. The glass will be etched, so it is slip resistant. The edges will be textured to show boundary and be slip resistant.

- Maintenance

  The system is comprised of interlocking modules that can be removed and easily replaced if any problems. The Engineering Services Department mentioned that UW Facilities would be in charge of maintaining these modules. *We will of course address this during our meeting with UW Facilities.

- Isolation of power

  Voltage will between 24-50 V. Ideally, we will not need to isolate the power source. However, if the voltage does exceed 50 we will work with the necessary campus departments and people to find the safest and most feasible solutions.

- Toxicity of materials

  We will be using red list compliant materials, meaning that we are avoiding chemicals that are known for having dramatic health hazards for people or the environment (heavy metals, lead, and certain types of plastic). See sustainability section (page 6-7) for more details.

- Road codes/building codes

  If approved for prototyping, we will work with necessary departments and people to be compliant when at the implementation stage.

- Solar

  Originally we were hoping to utilize kinetic energy, but the technology at this point is cost-prohibited (need closer to $100,000 to create a prototype) and further investigation would be needed. However, we are still interested in the technology and if the Amazon Catalyst award is received, we will be looking at adding this technology. Regarding solar, we are aware of its environmental concerns, but we will be working with Engineers Without Borders, UW Solar, Integrated Design Lab, and other necessary departments and people to make it the safest it can be for both the environment and people.

- Implementation

  Though this prototype is not designed to be implemented as is, the technology we are looking at has the overarching goal to be used for a full-scale implementable prototype. Talking with Engineering Services, they thought of some locations on East campus either on the Burke Gilman Trail (no cars to first test with people and bikes) or on Mason Road near the bridge over to the IMA. We will first be testing the prototype we designed in a controlled environment.

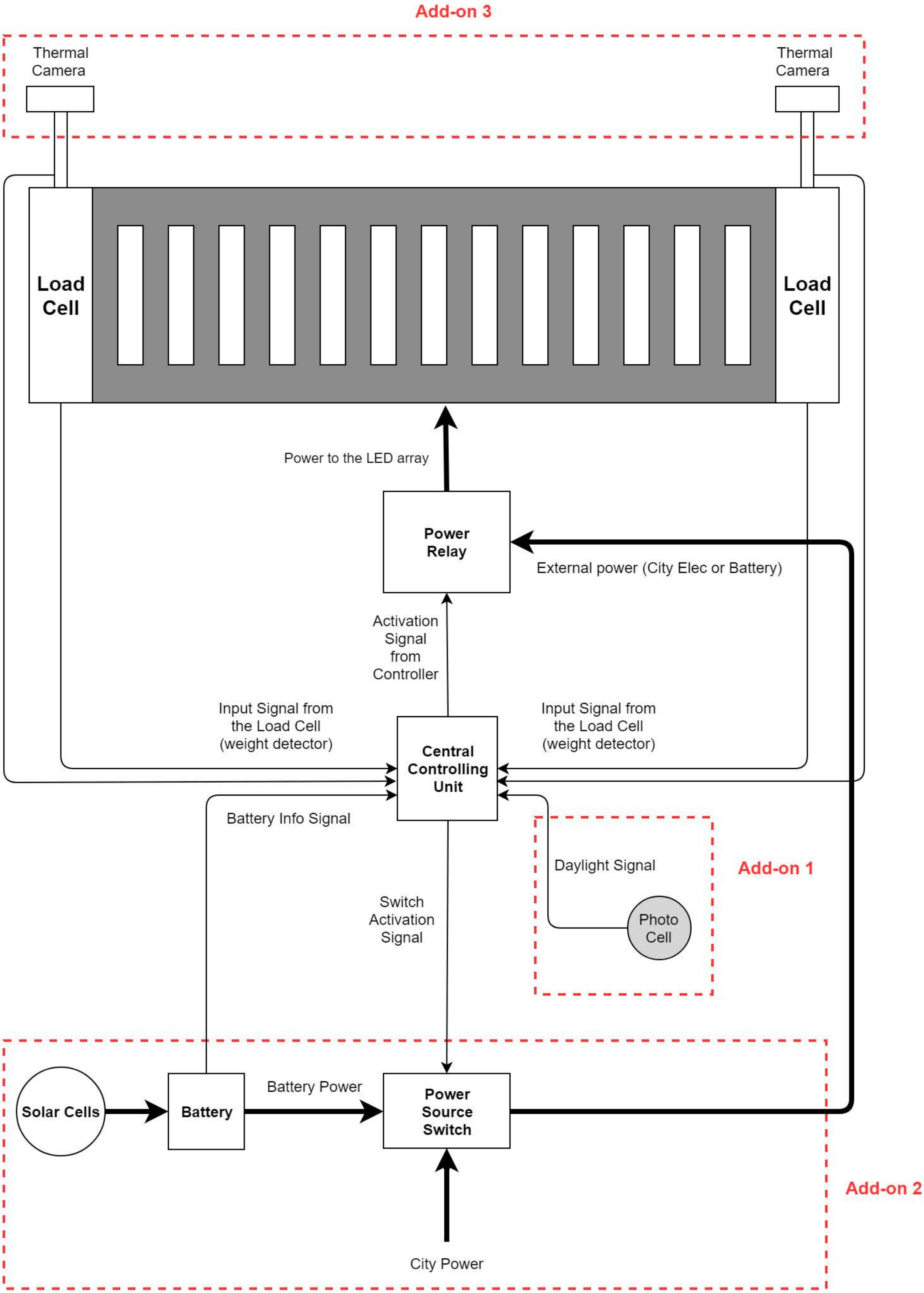
FUNDING

In addition to applying for the amount of $28,100.11 from the Campus Sustainability Fund as our primary source of funding, we will be applying for the Amazon Catalyst competition for $10,000 and the Cascadia CleanTech Accelerator Program. The Cascadia CleanTech Accelerator program, which has been recommended by Kyle McDermott and Sidney Orr is a program that helps cleantech systems advance in their business models and ideas. This program costs $775 per team, which the options of funding after the program is completed. Below is a quick table for funding estimation. Please review the complete table with links and details at the end of the document. The size of our prototype is 5' by 3' by 5" (depth could be as little as 4" or as tall as 6").

BUDGET

Item Name	Low Price	High Price
Load Cells	X24 at $138 each=Total **$3,312**	X32 at $138 each=Total **$4,416**
LED arrays	$12 (x144 *to have extra just in case of malfunctioning or bad strips) = totals **$1,728**	(Factor for breakages, totalling 106)= **Total $3,000**
Controller unit	$100	Starting at $1100
Power Relay Unit	$25	Same
Wiring/Circuitry	$200 total	$300
PhotoCell	$10	$20
Solar Panels (x2)	$189 x 2= **Total $378**	$370 x 2= **Total $740**
Battery	$155	$200
Energy source switch	Negligible	$50
Thermal Cameras (x2)	$50 each	Starting at **$1000 each**
Structural Glass (15 square feet x 2)	$100 per square foot x 30ft= **Total $3,000**	*Depends on thickness, finish, and donation from vendor (need proof of University support and funding before asking) (**low+$500**)
Etching for ADA compliant glass	$5 per square foot x 30ft= **$150**	$60+ per square foot (we want to support local glass etchers, so price is a little higher)=**$1,500**
Misc.	$1,000	$3,000
Cascadia CleanTech Accelerator program	$775	Same

ELETRICAL SYSTEM SCHEMATIC WITH ADD-ONS



BUDGET BREAKDOWN: REQUIRED AND ADD-ONS

Basic Design: The LED-lighted crosswalk
This is the most basic design for the crosswalk, which is going to turn on the LED arrays installed on the crosswalk once a pedestrian is detected standing on the load cells.

Item Name	Description	Low Price	High Price
Load Cells 	Detectors of the weight of the pedestrians, sending the signal to the controller unit.	X24 $138 each	X32 at $138 Same
LED Arrays 	Main light-emitting units of our system	$12 (x144 *to have extra just in case of malfunctioning or bad strips) = totals $1,728	Factor for breakages, totalling 106)= Total $3,000
Controller Unit	The controller unit is the central controlling unit of the electrical system, and is the sole intelligent part. It can be anything between a small FPGA/micro-controller and small versatile computer (e.g. a PC).	$100	Starting at $1100
Power Relay Unit	A simple power switch activated by an electrical signal from PC	$25	Same
Wiring/Circuitry	-	$200 total	$300 total
Plastic Sheet Polycarbonate Clear	Protects the electrical components	X5 at $67.73+ shipping (totaling $338.65)	X7 at $67.73 + shipping (totaling $474.11)

Add-on 1: Smart activation based on daylight
As an extension to our system, we can augment our design such that the panel only activates when there's not sufficient light (e.g. it's night time or it's cloudy). So we add a PhotoCell to our system to measure the environment's light and transmit the signal to the controller unit. Then it will decide whether to activate the panels or not.

Item Name	Description	Low Price	High Price
PhotoCell	The photocell detects the daylight sigan and sends it to the computer. Thus it will turn the LEDs on only during the night time or cloudy weather.	Negligible	$20

Add-on 2: Energy harvesting/storage from the sunlight
This add-on actually gives us a thrust to go eco-friendly by generating electricity from sunlight and store it to be used anytime available. (Please be advised that the controlling unit will still be powered from city electricity for reliability reasons, and will have its own UPS unit).

Item Name	Description	Low Price	High Price
Solar Panels	The panels to absorb sunlight and convert it to the electrical energy to be stored in the batteries.	$189	$370
Battery	The energy storage	$155	$200
Energy source switch	A computer controlled switch for switching between battery/city	Negligible	$50

Add-on 3: Smart control instead/complement to pressure sensing system
This add-on makes our system smarter, in which we are going to detect people via Thermal cameras instead of / in addition to the load cells. The cameras will be connected to the computer system and the images from them will be processed, and will help the computer decide to turn the LEDs on or off.

Item Name	Description	Low Price	High Price
Thermal Cameras (x2)	Thermal cameras to detect people through thermal radiation	$50 each	Starting at $1000 each

CITATIONS/LETTERS OF APPROVAL

Citations

Douglas, Kelly. 2017. “Campus Illumination Roadmap.” University of Washington. http://www.idlseattle.com/campus-illumination-roadmap-sustainable-exterior-lighting-university-washington-seattle-campus/.

“The Red List.” International Living Future Institute, 15 Nov. 2018, living-future.org/declare/declare-about/red-list/.

CAMPUS SUSTAINABILITY FUND
UNIVERSITY OF WASHINGTON

Project Approval Form (PAF)

Project Title: Kinetic Light-up Crosswalks: Phase 1

Primary Contact: Janie Bube, Master of Landscape Architecture 2020 Candidate

By signing this form, I confirm that the project lead(s) has/have discussed this project with me, and that I (*please check all that apply)*

- ☐ approve the stated project to be conducted on the University of Washington-Seattle campus (this approval can only be given by campus units or by individuals on behalf of campus units) **(REQUIRED)**.
- ☐ agree to be a part of the project team.
- ☑ will provide support to the project by being a partnering organization, department or individual.
- ☐ am the administrator for my campus unit and agree to for the financial and human resources Transactions associated with this project.
- ☐ agree to take over the operational costs of this project following completion.

Other notes *(if applicable)*:

Name/Signature: Christopher Meek [signature]
Date: 9 April 2019
Title: Associate Professor and Director Integrated Design Lab
Department/Organization: Department of Architecture
Phone: 206-616-7014
Email: cmeek@uw.edu
Additional Notes:

Please save this completed form as “Project Contact Name_Project Name” and email it to csfcoord@uw.edu. The email originating directly from the approving body will be considered a signature. Paper copies may be sent through campus mail to Attn: CSF Coordinator, Box 351248 or dropped off to the CSF Office at Gerberding Hall, Room B-40 and must include an original signature of the approving body.

Updated January 2014

CAMPUS SUSTAINABILITY FUND
UNIVERSITY OF WASHINGTON

Project Approval Form (PAF)

Project Title: Kinetic Light-up Crosswalks: Phase 1

Primary Contact: Janie Bube

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- ☐ agree to take over the operational costs of this project following completion.

Other notes *(if applicable)*:

Name/Signature: Kristine Kenney [signature: K. Kenney]
Date: April 15, 2019
Title: University Landscape Architect, Director of Campus Design & Planning
Department/Organization: UW Facilities Asset Management
Phone: 206-685-6430
Email: kkenney@uw.edu
Additional Notes: I look forward to watching this project advance through the prototype phase and working with you to determine the applicability on campus.

Please save this completed form as “Project Contact Name_Project Name” and email it to csfcoord@uw.edu. The email originating directly from the approving body will be considered a signature. Paper copies may be sent through campus mail to Attn: CSF Coordinator, Box 351248 or dropped off to the CSF Office at Gerberding Hall, Room B-40 and must include an original signature of the approving body.

Updated January 2014

CAMPUS SUSTAINABILITY FUND
UNIVERSITY OF WASHINGTON

Project Approval Form (PAF)

Project Title: Kinetic Light-Up Crosswalk Prototype Phase 1

Primary Contact: Janie Bube

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- ☐ agree to take over the operational costs of this project following completion.

Other notes *(if applicable)*:

JOE COOK [signature]
Name/Signature:
Date: 4/11/2019
ENGINEERING MANAGER
Title:
FACILITIES ENGINEERING SERVICES
Department/Organization:
(206) 221-6197
Phone:
joecook@uw.edu
Email:
Additional Notes: PROTOTYPE DEVELOPMENT

Please save this completed form as “Project Contact Name_Project Name” and email it to csfcoord@uw.edu. The email originating directly from the approving body will be considered a signature. Paper copies may be sent through campus mail to Attn: CSF Coordinator, Box 351248 or dropped off to the CSF Office at Gerberding Hall, Room B-40 and must include an original signature of the approving body.

Updated January 2014

CAMPUS SUSTAINABILITY FUND
UNIVERSITY OF WASHINGTON

Acceptance of Administrative Responsibility Form (AARF)

Project Title: Kinetic Light-Up Crosswalk Prototype Phase 1
Budget Number: *Will assign this pending award of funds.*
Grant Total: ~$30,000
Primary Contact: Janie Bube

By signing this form, I certify that I am the administrator (or equivalent) for my campus unit, in charge of expense, human resources, and other financial transactions; I agree to be responsible for any hiring actions and/or purchases associated with this project. I agree to financially track this project in a “16-” (ASUW) budget within the Financial Organization Code (OrgCode) structure of my unit (2520003000), and complete monthly BAR reconciliation.
unit OrgCode number

Notes (if applicable):

Name/Signature: [signature]
Date: 15 april 2019.
Title: Department Administrator
Department/Organization: Landscape Architecture
Phone: 206.616.6995
Email: vnL2@uw.edu

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