

Lighting the Way: Improving Lighting Conditions on the Ridge

By:

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Executive Summary

Lighting space is an issue for any urban environment that is utilized during dark hours. It is especially necessary for college campuses to provide adequate lighting due to the variability of its inhabitant's schedule and the sheer number of users. On Western Washington University's campus, the proximity to forested terrain and increased occurrences of voyeurism and harassment/assault has decreased student's perceived levels of safety on campus at night. One reason continuously stated for the lack of safety is inadequate lighting in and around residence halls.

This proposal aims to provide recommendations for a short-term solution regarding lighting upgrades at the Ridgeway Complex to temporarily increase safety until a full retrofit can be designed and implemented by the university. These recommendations will include ideas that can be implemented by the end of this year by Facilities Management or current Ridge residents.

The funding for this project would most likely come from the University Residences. The proposed budget for the replacement of key lights on the Ridge is around \$1,000 for purchase and installation of new lighting fixtures.

Statement of Need

During the initial review of the lighting scenario on the Ridge, problem areas were mostly discovered along one of the major transportation arteries of the complex that serves Sigma, Alpha, Delta, Omega, and Highland Hall (SHADO). Problem areas were considered any area with a general lighting deficiency: flickering light, too little light, and/or poor light transition between forested area and path. Areas where the path goes underneath the residence halls of the SHADO community were all deemed a problem, along with the northern connecting pathway behind Carver Gym and the southern connecting route near the Recreation Center track.

Upon further investigation, a survey of students on the Ridge showed that most students would take the path through the SHADO community instead of other paths within the complex. Students said they would use that path over other routes through the complex at night or if they were alone. Many students felt uncomfortable in and around the parking lots on Highland Drive. Parking lots pose a unique problem as they are neither walking destination or connection. Providing additional lighting to a relatively low foot traffic area is not cost effective.

After being made aware of the projects under consideration by campus facilities to fully upgrade the lighting on the Ridge, we decided to shift focus to a short-term fix while facilities conduct their research and begins work on the upgrade. It is important to note that the idea of safety is ambiguous and is not reflected unanimously across the surveyed population. While students

ultimately deserve an upgrade that satisfies all desired safety levels, a temporary upgrade to the most utilized route through the Ridge Complex, along with connecting routes to the main body of campus, can provide students a safe alternative to preferred paths that is safe and well lit.

In addition to temporary lighting upgrades, this project will work to include a student voice to the large projects being conducted by campus facilities by collecting additional survey data of current residents. Per the recommendation of concerned parties, a student voice will provide additional leverage when requesting funds for lighting upgrade projects. It is important for students to have a voice in campus matters, and we will provide an opportunity for students to participate in the campus political process.

Project Description

Goal: Improve student's perceived safety by upgrading lighting throughout the Ridgeway Complex in a sustainable manner.

Objectives: Our proposed temporary lighting upgrades will improve on the current situation by creating a central, well-lit route through the complex. This project is focused on a short-term solution to help current Ridgeway residents while a long-term solution is found and implemented. Within the scope of the long-term project being conducted by facilities, this project will include directives for including a student voice in the decision-making process.

Methods:

1. Initial student survey input
 - a. To understand specific concerns of current residence, a survey was conducted pertaining to areas of concern and routes taken by students. The survey consisted of responses from 24 current Ridge residents, 12 men and 12 women (preferred pronouns were included in the inquiry to help parse inconsistent data between genders). About 46% of those surveyed stated that they change their walking route when it is dark.
2. Current facilities projects
 - a. After speaking with Josh Kavulla, an electrical engineer for WWU, and Terence Symonds, Associate Director of University Residence Facilities, it became clear that they had collected a large amount of relevant data, including: student input, light measurements, and budget considerations. At this point, we will consider them collaborators and will integrate some of their data into our own assessment.
3. Research
 - a. To fully support a recommendation for a short-term lighting upgrade on the Ridge, we conducted research regarding various types of LED lights, along with various wall mount light fixtures that would be effective on the Ridge. We also

researched possible ways to light portions of the desired routes connecting the Ridge to campus with solar powered lights. We were later told that any lighting fixture not cemented to the ground would not be accepted, so research on solar paneled lighting was ended. This research was done with both cost efficiency and effectiveness in mind.

4. Student voice

- a. To fully integrate a student voice into the project already being conducted by the facilities and electrical engineers on campus, we will conduct a thorough survey of the current Ridge residents.
 - i. The survey will include the following questions/statements:
 1. What dorm do you live?
 2. Over the past 3 months, estimate the number of walking trips per day you took in the dark:
 3. Rank how safe you feel walking on the Ridge at night:
 4. If applicable, indicate any specific places you feel unsafe on the Ridge in the dark:
 5. How much does adequate lighting contribute to your feeling of safety?
 6. Lighting conditions are adequate on the Ridge for student safety:
 7. Do you change you walking routes when it is dark?
 8. Other comments about lighting on the Ridge:
- b. The data will be presented to both Facilities Management and Sue Sullivan, the director of Environmental Health and Safety.
- c. Preliminary data is appended to this document.

5. Funding and Implementation

- a. Funding request would be through University Residences, as they oversee campus lighting.
- b. Once funding is secured, lighting upgrades will be purchased via online suppliers, or vendors already associated with WWU. Depending on what types of lighting upgrades are viable with available funding, either facilities staff or the proposal writers will install the new hardware.

6. Project Timeline

- a. The timeline for this project will be short, since only a few problem lights will be replaced, being between 1-2 months. For reference, a project to improve the lighting on the Hawaii Pacific University campus took 3-4 months from researching different lighting options to installing the lights. The scale of that project was greater than our project, with a major portion of the HPU campus being retrofitted, so a shorter time frame for our project can be assumed.

Budget

An estimated budget for replacing the wall mounted lights is around \$1,000 dollars, considering the man hours for installing the lights and the cost of materials.

For this project, we are focusing on replacing the wall mounted lights along the main arterial of the Ridge. These lighting fixtures can be replaced quickly while the long-term retrofit is decided on. Wall mounted lights ranged from \$75-\$140 from online retailer such as amazon and the Home Depot's website. The main areas looked at for replacement were under the Delta, Omega, and Sigma dormitories, which connect to the main arterials of the Ridge. Around five wall mounted lights would need replacement, with an addition of two more, one under Sigma and another underneath the main entrance to Omega.

LED light bulbs ranged from \$2.00-\$10.00 per light, with the A19 LED light bulb being the likeliest candidate for the replacement. A19 LED average 44 Kwh/yr under the assumption that they are ran 10 Hr/day year-round.

An estimated budget given by Josh Kavulla was put at \$300,000 for a full retrofit of all lighting fixtures on the Ridge. Since the SAF budget during 2017 was around \$759,000, requesting funds from the SAF would drain too large an amount of money to be worth the benefit. Funding for a full retrofit would have to be approved by the UPRC, which is the aim of the campus facilities project already.

Sustainability

Replacing the wall mounted lights is a short-term project that will only need to be implemented once. The only maintenance required is replacing the light bulbs when they expire, but with the long lifetime of LED lights, the cost of replacement bulbs is marginal. The funds for the maintenance would be from the budget for grounds maintenance on the Ridge. The proposed budget for this project would cover installation of the new lights, and with the required maintenance on the fixtures being low, adding the expense to ground maintenance would not be difficult.

Monitoring and Evaluation

Monitoring of the proposed lighting can be performed by the groundskeepers on the Ridge to ensure the lights are well maintained and that the lights are not vandalized. The grounds keepers are useful once the project is completed, but the ones monitoring the project during installation would be the engineers installing the lights.

An evaluation of the project can be done through student survey to see if the lighting improves the sense of safety in the Ridge. The survey can be conducted through the sustainability representatives living on the Ridge, who can connect with the main body of students on the Ridge. The survey can be as frequent as once a month, or possibly an annual survey that is given to new residents of the Ridge to measure their first impressions of the lighting on the Ridge.

Conclusion

This project aims to improve student safety and campus sustainability through improvements to lighting on the Ridgeway Complex. Residents of the Ridge have already expressed their concern that insufficient lighting has reduced their sense of safety during transit from the residence halls to the main body of campus. Due to the increased instances of voyeurism and bodily exposure over the past few years, low levels of perceived safety are warranted.

The estimated budget for a full, long-term upgrade to the Ridge lighting regime puts a long-term recommendation outside the scope of this proposal. Instead, we are recommending a short-term, stop-gap solution to appease concerns of the current residents. Also, to ensure that specific needs will be met by the university, we are proposing a strategy to include a student voice in the work being done to fully renovate the lighting throughout the Ridge and beyond.

Appendices

Default Report

Ridge Lighting

March 18th 2018, 7:27 pm MDT

Q1 - What dorm do you live in?

<u>#</u>	<u>Answer</u>	<u>%</u>	<u>Count</u>
<u>1</u>	<u>Alpha</u>	<u>11.35%</u>	<u>21</u>
<u>2</u>	<u>Beta</u>	<u>15.68%</u>	<u>29</u>
<u>3</u>	<u>Delta</u>	<u>7.03%</u>	<u>13</u>
<u>4</u>	<u>Kappa</u>	<u>17.30%</u>	<u>32</u>
<u>5</u>	<u>Sigma</u>	<u>8.11%</u>	<u>15</u>
<u>6</u>	<u>Omega</u>	<u>8.65%</u>	<u>16</u>
<u>7</u>	<u>Gamma</u>	<u>24.32%</u>	<u>45</u>
<u>8</u>	<u>Highland</u>	<u>7.03%</u>	<u>13</u>
<u>9</u>	<u>I do not live on the Ridge</u>	<u>0.54%</u>	<u>1</u>

	<u>Total</u>	<u>100%</u>	<u>185</u>
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Q2 - Over the past 3 months, estimate the amount of walking trips you take per day in the dark:

<u>#</u>	<u>Answer</u>	<u>%</u>	<u>Count</u>
<u>1</u>	<u>1-5</u>	<u>54.84%</u>	<u>102</u>
<u>2</u>	<u>6-10</u>	<u>17.74%</u>	<u>33</u>
<u>3</u>	<u>11+</u>	<u>27.42%</u>	<u>51</u>
	<u>Total</u>	<u>100%</u>	<u>186</u>

Q3 - Rank how safe you feel walking on the Ridge in the dark?

<u>#</u>	<u>Answer</u>	<u>%</u>	<u>Count</u>
<u>1</u>	<u>Safe</u>	<u>18.38%</u>	<u>34</u>
<u>2</u>	<u>Somewhat safe</u>	<u>32.43%</u>	<u>60</u>
<u>3</u>	<u>Somewhat unsafe</u>	<u>30.27%</u>	<u>56</u>
<u>4</u>	<u>Unsafe</u>	<u>18.38%</u>	<u>34</u>

<u>5</u>	<u>No opinion</u>	<u>0.54%</u>	<u>1</u>
	<u>Total</u>	<u>100%</u>	<u>185</u>

Q5 - How much does adequate lighting contribute to your feeling of safety?

<u>#</u>	<u>Answer</u>	<u>%</u>	<u>Count</u>
<u>1</u>	<u>A great deal</u>	<u>32.43%</u>	<u>60</u>
<u>2</u>	<u>A lot</u>	<u>32.97%</u>	<u>61</u>
<u>3</u>	<u>A moderate amount</u>	<u>25.41%</u>	<u>47</u>
<u>4</u>	<u>A little</u>	<u>7.57%</u>	<u>14</u>
<u>5</u>	<u>None at all</u>	<u>1.62%</u>	<u>3</u>
	<u>Total</u>	<u>100%</u>	<u>185</u>

Q6 - Lighting conditions are adequate on the Ridge for student safety:

<u>#</u>	<u>Answer</u>	<u>%</u>	<u>Count</u>
<u>1</u>	<u>Strongly agree</u>	<u>10.87%</u>	<u>20</u>
<u>2</u>	<u>Agree</u>	<u>26.09%</u>	<u>48</u>

<u>3</u>	<u>Nuetral</u>	<u>31.52%</u>	<u>58</u>
<u>4</u>	<u>Disagree</u>	<u>25.00%</u>	<u>46</u>
<u>5</u>	<u>Strongly disagree</u>	<u>6.52%</u>	<u>12</u>
	<u>Total</u>	<u>100%</u>	<u>184</u>

Q7 - Do you change your walking routes when it is dark?

<u>#</u>	<u>Answer</u>	<u>%</u>	<u>Count</u>
<u>1</u>	<u>Every time</u>	<u>11.89%</u>	<u>22</u>
<u>2</u>	<u>Most of the time</u>	<u>21.62%</u>	<u>40</u>
<u>3</u>	<u>Sometimes</u>	<u>36.22%</u>	<u>67</u>
<u>4</u>	<u>Never</u>	<u>30.27%</u>	<u>56</u>
	<u>Total</u>	<u>100%</u>	<u>185</u>