Abraham Perez

Introduction to Technical Writing

Julia Romberger

4/19/2022

Project 4- Research Paper (2278)

Introduction:

Lampposts have been a thing since the 1800s, they help illuminate the streets so that way you don't go bumping into one another or don't crash your car into a 7-11. But the thing is, there haven't been many renovations to them as of recently. The standard street lamp has a sodium-vapor gas-discharge light, which fortunately does not produce a lot of light pollution, but it's still very dim compared to others. This made me start to think "Hey, why not think of some ideas to improve this?", and low and behold, I wasn't the only one to think of this. Related to the topic at hand, in the article *A web-based control system for traditional street lighting that uses high-pressure sodium lamps*. (Thungtong, A., Chaichan, C., & Suwannarat, K. (2021, November 5)), there have been researching methods for improving lampposts by making them turn on and off automatically with a sensor. I thought to myself what are some more realistic ideas?. This led to me gathering my data and seeing overall how I can improve the lampposts around the ODU campus.

The main goal here is to come up with ideas to improve the lampposts around the ODU campus, as said in the previous paragraph. But there would be some limitations to my research. An example would be not being able to fully grasp what features the lampposts have, as in being able to look at the circuity. Another would be not being able to see the top of some of the lampposts, just try and give me a simple solution of seeing the top of a 30ft lamppost with no building I have access to.

One of the major goals of improving lampposts would be to increase the safety of the people walking by. There was this one article, Smart lampposts: Illuminating smart cities (Raicu, I. (2019, September 19)), that showed how improved lampposts increased safety in cities with big crime rates. Although the addition of a microphone to the lamppost may help report gunshots, it can also be a bit nosy when passersby walk by. This article helps show how you need to look into what is deemed suitable for lampposts but also how it will affect the people walking by them. Improving the safety of pedestrians by adding security features to the lampposts would be a smart move, but you also need to think of how much these improvements are going to cost, as stated previously in this paper. You may have the ideas, but how far can you go with such a limited budget or even if you take money from your pocket and invest in this project. I looked into the whole "panic button" scenario, there are supposedly panic buttons around the ODU campus called blue boxes. But there are only roughly 4-5 of them spread out. This could help support why we should implement the panic button feature into the lampposts instead so that way there wouldn't be any waste by just adding a box sticking out of the ground. Although the box has a light on the top, which adds as a safety feature, its functionality only goes so far. The overall impact of improving lampposts will play into many things that are considered unimportant to others, but what is important is choosing what is effective and helpful and what is considered inefficient and useless factors. Think of it as a yes or no situation, it may be simple but sooner or later, you're going to have to think a while about your decision.

One method that did sound useful was having people take a survey about how they feel when walking the streets at night. This was done in the article *The science of street lights: what*

makes people feel safe at night. (Uttley, J., Monteiro, A. L., & Fotios, S. (2018, September 28)). It sounds like a well-thought-out idea, and it even sounds like it correlates with the research topic. Although this method is an interesting and effective one, I did not apply it due to not thinking of it when recording said data. Another example of an improvement would be improving the light level of the lampposts and maybe adding a "panic" button to it when people don't feel safe alone. Besides that, getting the data needed is simple.

My main research question is how can I influence the improvement of lampposts around the ODU campus? Using the info from previous sources, in which a majority thought of methods to improve lampposts by increasing the safety of the pedestrians and making the lamppost more energy efficient, this being said in almost all of the sources listed near the end of this paper except for the article *Led streetlights: Doctors issue warning - CNN* (Stevens, R. G. (2016, June 21)). Although their methods are stated in the sources referenced, a majority of them you would have to find out by reading the source(i.e. *Led streetlights: Doctors issue warning - CNN* (Stevens, R. G. (2016, June 21))). I would gather my own data by creating my own methods, which would most likely be taking pictures of the lampposts and reading the light level. By taking a major in Electrical Engineering Technology, this project would be a bit less stressful having some knowledge beforehand.

Methods:

Stepping into methods, there were some ideas of what I could do. To be honest, one crazy one I got was climbing the lampposts and seeing what's on the top. But, due to legalities, this wouldn't be the safest method to do. The most basic one, which I did, was to take photos of the lampposts and read the light level by using an app on my phone that used the camera and gave the results in lumens. Although I would've done something more unique, an example would be researching the main layout of the average ODU lamppost, I went with the simplest method of taking photos and recording the light leveling data. I did this by taking photos one afternoon while walking with a couple of friends. Later that night, I went around recording the light level. To be more specific, I went down to Whitehurst beach and recorded the data on the lampposts and streetlights. It was a good handful amount of lampposts I recorded, say around 10ish.

The methods for improving lampposts and gaining research seem rather simple, but it's also a matter of perspective. When you think about it; you have to go into the lamppost and see the circuity, how it works, what's deemed useless, and what can be improved upon. But you might as well have a college degree in the Engineering field by then. With that out of the way, we have the methods, now let's get into the results.

Results:

The results of this research were rather simple and not complex. I took pictures of the lampposts and recorded the light levels of the different types as stated in the previous section.



The graph shown above represents the type of lampposts around campus and the light level they give off.

As you can see, the street lights around campus have a very minuscule light level compared to the other lampposts. This shows how the impact of improving lampposts must be necessary to even drivers during the night, which would include improving the streetlights as well. I mean it would probably be helpful to see while driving so that I don't accidentally hit a pedestrian, further note, the average light distance a street light gives off is roughly 10-12 meters. But also the amount of light coming from the circular lamppost is a bit concerning. You have to think, how much light is too much? Because when there are several lampposts near each other giving off the same high amount of light all at the same time, there's going to be an ethical issue with light pollution. Luckily, the lampposts around campus are spread out just enough to be considered safe lighting. The difference between street lights and the walkway lampposts is somewhat interesting, that being the light distance for lampposts is 8-10 meters while street lights are 10-12 meters. The lampposts for pedestrians may be brighter and more efficient, but the streetlights seem to give off less light level and may be a bit concerning for drivers.

But it makes you wonder, when can you help out and when is it considered overdoing? Looking at it from another perspective, you may see it as an unnecessary move towards just wasting money on something that's already useful. But from my perspective, I see it as stepping into a more important matter that must be taken into a preservative value and see what needs improving and how much is this going to cost. Because when you consider it, there's also the financial side of this project, but that's to be discussed later.

Moving on from comparing other sources of research, I can say that the main priority for improving lampposts would be finding the suitable type of lighting and making sure it gives off the proper amount of light that won't cause harm to the human eye but as well increase the feeling of safety while walking at night. Even updating old lampposts on long-forgotten roads and being a useful testing ground, seeing what kinds of light work well.

Discussion:

Pushing aside the data and the results of the project, let's get into the discussion of this research topic and its overall significance. You have to look at improving a product, see how effective it is, and also how it will create an impact on the people who will use it.

Improving the lampposts around the ODU campus is an important factor in improving the campus as a whole. When you look at it, you see that it seems to be quite a normal R1 campus. What if we changed that? All I'm saying is that if we were a campus known for creating an efficient lamppost system that helps the community/environment and their layout of lampposts plans can be easily accessible to the public, making the campus LEED Certified would help get more positive feedback and help increase the support in improving the campus. With the advancements in technology, there would hopefully be even a smudge of interest in improving lighting, with the whole thing having to cost a fair share of the money but will overall benefit the campus.

With the whole improvement strategy, you also need to think of what features should be added or removed from the lampposts. I would suggest adding a solar panel as well as security cameras. But I would also remove the different types of lighting on the lampposts because a fair share of them use incandescent lights, which are much less effective than LED lights. I guess you can also play height into the factor of improving lights. The reasoning behind this would be that since most lampposts are usually tall, people would feel like something is watching them from afar instead of easily seeing the lamppost right above them. But that's more of a discussion topic than a method. There was this one article I remember, *Led streetlights: Doctors issue warning - CNN* (Stevens, R. G. (2016, June 21)), stating that heavy amounts of LED lighting can hurt your eyes. Although this would take a while if someone would stand under the said lamppost. This can help support how improving lampposts would include changing the type of lighting as well as the amount of light it gives off. Although switching to incandescent light would be beneficial, it won't give off the same efficiency as LED light will. An analogy I can think of from this would be that you can only go so far with a product that you've repaired so many times, that one day, you're going to have to get a new one that's more efficient and less expensive than repairing the old product. From what you can take from this is that the decision to be made from this is whether should you increase the brightness of street lights and lampposts but risk eye damage to pedestrians, or improve the old street lights with newer lighting that the lampposts already have (creating an equilibrium of some sorts).

Enough about me ranting, let's talk about effectiveness. Working on an old product may be a bit of a challenge, but you need to see the long-term effects of the new improved version of it. You would be thinking of the overall goal and success of the product. But most of all, will it work and will people like it? The effectiveness of lampposts can date back to the early 1800s when it was simply a candle inside of a glass box on top of a pole. Now look at it nowadays, we have a lightbulb efficient enough to illuminate an entire street and run on electricity. Just thinking of how far we've gotten with lampposts is amazing. Anyway, the lamppost can be considered an improvement in technology, but nowadays people just glance at it and go on with their lives.

I've talked about effectiveness, now let's talk about the overall impact these improved lampposts would have. Improving lampposts around the ODU campus may seem a bit unimportant, but it does play a huge factor in our everyday life. An example would be the way we feel while walking at night, or even how well our eyes feel when looking upwards. Even safety plays a huge factor in the implementation of lampposts, the main reason they're there is that it helps allow people to be seen, thus creating less crime. Overall, it comes down to making choices that both benefit the people that use said objects and how much it will cost. You just may not see it easily, but others with a more technological thought process may see it clear as day. Maybe I'm overdoing my step in bettering the community of the campus or I'm a complete genius for thinking of a topic that hasn't been discussed in ages, who knows. In the end, it all depends on whether or not improving lampposts will be helpful or considered a waste of money and time.

Works Cited

Thungtong, A., Chaichan, C., & Suwannarat, K. (2021, November 5). *A web-based control system for traditional street lighting that uses high-pressure sodium lamps*. Heliyon.

Retrieved March 7, 2022, from

https://www.sciencedirect.com/science/article/pii/S2405844021024324

Uttley, J., Monteiro, A. L., & Fotios, S. (2018, September 28). *The science of street lights: what makes people feel safe at night*. The Conversation. Retrieved January 23, 2022, from <u>https://theconversation.com/the-science-of-street-lights-what-makes-people-feel-safe-at-nig</u> <u>ht-103805?classId=ffb15cf5-14b9-4a6d-bbc3-af721d45524c&assignmentId=9fbb0f86-e6d</u> 7-4f4a-98cd-9c47b5ae4e3a&submissionId=f1c6ec41-7b0e-c165-08cc-2d44c230d9e7

Stevens, R. G. (2016, June 21). Led streetlights: Doctors issue warning - CNN. CNN health. Retrieved March 27, 2022, from

https://www.cnn.com/2016/06/21/health/led-streetlights-ama/index.html

Raicu, I. (2019, September 19). *Smart lampposts: Illuminating smart cities*. Markkula Center for Applied Ethics. Retrieved March 27, 2022, from <u>https://www.scu.edu/ethics/focus-areas/internet-ethics/resources/smart-lampposts-illuminat</u> ing-smart-cities/?classId=ffb15cf5-14b9-4a6d-bbc3-af721d45524c&assignmentId=9fbb0f8 6-e6d7-4f4a-98cd-9c47b5ae4e3a&submissionId=f1c6ec41-7b0e-c165-08cc-2d44c230d9e7