

Donella Watkins

Urban Studies Senior Capstone

To Light Wasson Way or Not To Light Wasson Way That Is the Question

Question/ Topic

Would adding lighting to Wasson Way be beneficial to the users of the trail and as well as the surrounding neighbors? What would be the best practice of lighting, and what are the economic values associated with adding lighting to the trail? What challenges are associated with adding lighting?

When asking the question of whether lighting the Wasson Way path is the right thing to do it is important to look at some of the reasons that lighting offered in the first place. The following articles offer insight into the residential environments and their perceived safety. These articles will help provide a correlation between the communities that they serve and the neighborhoods that Wasson Way intends to serve.

Description of the Studio and how it fits

One of the objectives of this studio is to connect students to stakeholders of the community in shared problem solving and addressing urban opportunities. By further researching the question that has been a long debate of the Wasson Way project this project will lend itself to the decision making process of the lighting issue. It will discuss both the positive and negative aspects associated with lighting a bike and light rail path. This will be useful in assisting the community with some questions that they may pose and allow designers to take a look at where lighting may be a better fit if any.

Description of the research question

The lighting of any bike path or trail has been a debated issue for some time. There are several reasons that the decision is so controversial some of those issues are safety, economics, light pollution, maintenance, environmental impact, and overall design of a path. This research paper will take a closer examination of each one of these issues so that the Wasson Way project will have the best possible outcome for both the users of the way and the citizens living and working in the neighborhoods that lay home to it.

When talking about lights and safety one of the bigger arguments is, do lights on the path make the user safer or more vulnerable to potential attackers? It is also important to look at the amount of light that is given off and the visibility of the users. There are many risk factors associated with no having lights such as potential user collisions and accidents. The issue of user comfort must also be taken into consideration for do users feel safer with a lighted path as opposed to an unlighted one?

As with every project, there is a financial assessment that must be done to ensure that the project is feasible. It is important to do a price comparison of other similar projects and examine many of the lighting options. When looking at cost product cost, installation, and maintenance must all be considered for both the immediate time and the future.

Light pollution is caused by a disproportionate or obtrusive synthetic lighting. This can not only have an effect on the community that surrounds Wasson Way but on the environment as well. When light pollution is dominant in an area it can remove the ascetic appearance of the environment. Issues associated with the light pollution would be that how much would a light project give off at Wasson Way, and how could this be minimized with the use of technology and placement to make the least amount of impact.

Maintenance of the trail is something that will have to be considered not only to promote continued usage but to ensure the safety of the user. When adding lighting to the equation it becomes a more complex issue because it may require those who are participating in the maintenance of the trail have experience with the equipment necessary to light the way. However, when the requirements of a position increase so does the pay expected for that position. Therefore, it is will be important to look at all the maintenance alternatives carefully to keep costs efficient.

References and Resources

The main resource used in the research is a book by Duco Schreuder called, outdoor lighting: physics, vision, and perception. This book illustrates the common practices of outdoor lighting installation as well as the equipment needed for such projects. Journal articles reflecting research that has been done to associate the usage of light and human's perception of security these include: Feeling Safe in the Dark: Examining the Effect of Entrapment, Lighting Levels, and Gender on Feelings of Safety and Lighting Policy Acceptability by Christine Boomsma and Linda Steg, Evaluating the Influence of Fear of Crime as an Environmental Mobility Restrictor on Women's Routine Activities by Carl Keane, and Fear

of Crime in Residential Environments: Testing a Social Psychological Model by Adri Van Der Wurff, Leendert Van Staalduinen, and Peter Stinger.

Data Collection and Timeline

The time frame for data collection for each of the topics will be one week. Following that the data will be analyzed using a pros and cons approach. All the information collected will then be used to form the research paper as well as the recommendation. The last week will be designated for the poster completion and any last minute alterations that may come up.

Using a comparison study of many other bike and light rail paths to compare to techniques of lighting, and applying them to Wasson Way will be one of the strategies used in this research project. Another source of information will be gathered by collecting information from a questionnaire given out to current path users. This questionnaire will address issues such as how lighting affects their feelings of safety, What they use for lighting on paths now, how often they use a path, and what qualities they feel are important when selecting a trail or path. The usage of journal articles regarding issues such as safety and cost will be addressed in the research. There will also be a cost comparison of lighting options that may be feasible.

Outdoor Lighting

Lighting can be classified into three purposes: utilitarian lighting, amenity lighting, and decorative lighting. For the purposes of Wasson Way the lighting that would be considered is amenity lighting which is used generally for public spaces, residential streets, and malls. The purpose of amenity lighting is more for the ascetic and safety feelings of the person utilizing the space than for actual lighting purposes. In fact, until recent history the lighting for social safety or to enhance amenity has never been reason to put lighting in an area. It is important to also weigh heavily the costs associated with a project on either side to determine if lighting is a good investment.

Fear of Crime in Residential Environments Study

In the article titled Fear of Crime in Residential Environments a survey was using responses of questions by 110 randomly sampled participants in the Netherlands to rate the feelings of safety. They

were instructed to answer the questions based on how they would be feeling if placed in a variety of six situations. The questions were written in a way that would portray the surroundings of the individual unfamiliar. While there was never any statement made about danger within the area, it was certainly perceived that way by many of the participants. The answers were done so that a rating system could be used for the participants feeling of safety (1 being completely safe and 5 being not at all safe). A sample of one of the situations include: One afternoon you're standing at the bus stop nearest home, when a group of 15-to 16 year old boys comes along. They begin kicking the bus stop and daubing graffiti on the bus shelter.

By closely examining the responses of the participants, researchers found that it was not only possible to roughly measure the fear that one possesses in a given situation, but to also more precisely indicate the specific fears within the given situations thereby making those situations more avoidable. While the study didn't answer the specific question of what caused the fear in general situations presented, it did open the door to more research of the topic as well as more studies in a more specified area.

This study also lent itself to the reason that people perceived the chances they would be victimized in any given situation. The attractive factor indicated that the potential victim felt that someone would victimize them because they found attraction either in their person or in their possessions. Evil intent factor relates to the criminal intentions of the perpetrator. The power factor is lends itself to the self-control and respect that the victim feels that they would possess to prevent the crime from occurring to them. While criminalizable space is a location that sets the tone for a victimizing situation to occur because of the surroundings or a lack of prevention measures.

Gender Safety Study

88 Dutch first year psychology students were asked to look at pictures two were of the same scenery with a variation of lighting (high and low). These students were then asked to rate their feelings of their perceived safety. What they found was that women often perceive their social safety much lower in the same situation with lower lighting as compared to men. The study concluded that college students and three times more fearful of a sexual natured crime as men. Women also are more likely to change their routine to avoid situations that make them have a perceived sense of lower safety.

Concealment and Entrapment are the two biggest contributors in perceived safety. It is important for individuals to be able to conceal themselves from others if they feel it is necessary

however, they do not want an environment that lends itself to the concealment of a potential perpetrator. Entrapment coincides with the situation because individuals have a greater want for escape routes if necessary, it is very important to feel that they have multiple ways to get out of an area if it becomes necessary for them to leave.

How does it apply to Wasson Way?

When discussing the reasons for lighting or for opposing the lighting it is important to avoid making this location a criminalizable space for multiple reasons. If people feel that they have more of a chance to become victimized by using the trail they will either only use it on specific occasions or avoid it all together. In making this trail both a transportation hub and a recreation destination it is important to promote continued use for it not make it into something that potential users would avoid.

Wasson Way will be a public entity used by many different types of people at various times of the day. While all hopes are that everyone will come onto the path with good intentions and use it for the intended purposes of recreation and transportation, it is important not to take the safety concerns of the public for granted. This studies shows that women are more likely not to use the path if they perceive a threatening environment exists. This can be avoided in accordance with the study by adding high visibility lighted areas on the trail. Another way that the trail can be seen as more of an inviting environment is by lessening the feelings of entrapment that some trails hold. This would require there to be several opportunities to enter and exit the trail, giving it more of a wide open feeling. Design of the amenities is also important when looking at the perceived safety of the used because while the amenities are nice when there is little lighting and visibility these places can become places of concealment. Therefore it important to take a quality not quantity approach to the design of the trail because more things offer more places to hide and lessen the security felt by patriots using the trail.ⁱ

How does lighting effect the surrounding environment?

There are many types of lighting used in public spaces these may include street lighting, advertising lighting, architectural lighting, domestic lighting and vehicle lighting. Although the degree of brightness could vary depending on the light source, there are still effects on the surrounding communities. The communities effected can be the plant life, animal life, and even the humans living in that vicinity. Research has noted that there are issues involving the natural photosynthetic system in plants because there is a constant light source and even though it is not the sun. It is constantly adding light to the photosynthetic process. When observing animals it was notice that the animal's visual

system was effected. This was especially true in nocturnal species. The impairment added difficulty not just in the animal's daily routine, but in its ability to find food as well. Many of the animals so significantly impaired that it interfered with the natural occurring life cycle and the animal would become the prey of another animal. Some animals were able to adapt by moving their routine of hunting earlier in the day, however this became a problem for the surrounding community. In some cases it was more beneficial to the predator because they were more able to spot the prey. With the added adaptation the prey is left vulnerable and eventually became scarce in the area due to death and migration.

Light pollution depends on several different factors space, time, and spectral composition of the lighting. Lighting that is placed in close proximity to one another and other sources are more likely to present the sky glow effect than in other situations. For example the lighting of a suburban neighborhood with the porch lights, street lights and all of them in close proximity. This factor is important to consider when looking at the lighting for Wasson Way because if the lighting is placed in such a way that it is too close together it can present such a problem of light pollution and neighborhood disruption.

Timing is another element that can affect the light pollution of an area. In the last century the use of lighting has not only increased in areas, but it has increased in duration. Meaning that people are not only using more lights but they are using them for longer periods of time. Lights are being used from everything to sporting events, to security. Many of the light sources are being turned on before dusk and don't get switched off until dawn. One of the solutions to this is the timed switch which allows the user to select the time when the lights will be switched on and turned off. Another solution that many of the bigger corporations have done is to select random times when sections of the lighting will be off for a period of time throughout the night. This allows them to heighten security in that selected period of time, and arrange the other areas so that lighting can effective be supplied without intervening production or services provided.

This is another important element when designing the lighting for Wasson Way not only because of the disruption to neighbors but also to the disruption of lighting. Adding a timing system to the lighting proposed on Wasson way would not only reduce the cost in the long run while also reducing the light pollution and potential sky glow. The initial startup cost of the device would be an investment for Wasson Way, but the overall outcome would be extremely beneficial.

What Products are available

The dark sky association has a helpful guide online that aids in finding appropriate environmentally friendly options. These lighting options come in a wide variety of forms such as highway lighting. Pole lighting is another option which can come in multiple styles some give more of a aesthetic feel than others, and it is important to consider the overall design when choosing appropriate pole lighting. Many of the products recommended by the dark sky initiative have a small hood over the light fixture itself which reflects the light down and out rather than straight into the sky. This hood helps to lessen the impact on the environment in reference to light pollution.

Proposal

Since Wasson Way will be comprised of many different neighborhoods and multiple land usages it would be most beneficial to consider a mixed lighting approach to the trail. This approach applies lighting to an area based on the needs of that area rather than a universal lighting solution for the entire trail. This approach can be seen in the Chicago Lakefront Trail that was mentioned previously. The mixed lighting approach is not only more aesthetically pleasing, but it is also more cost efficient because the best optimum placement is being used as well as the environmental benefits.

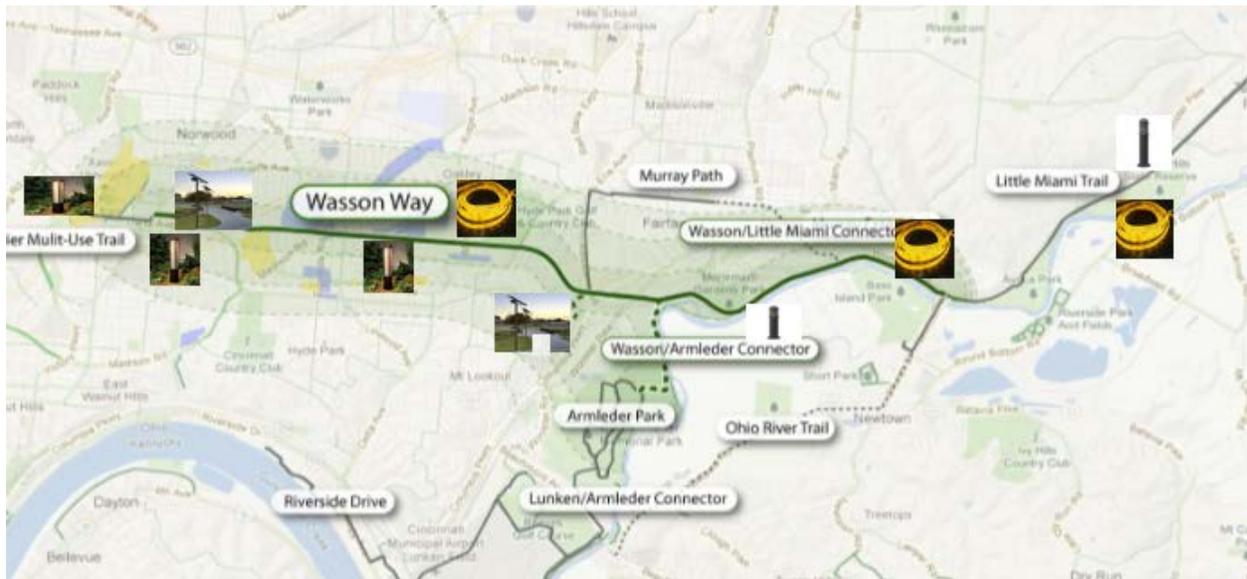
In the area of Hyde Park it may be more beneficial to look at using the already existing lighting because this is a commercial area with several centers and public spaces. It is already well lit and it would be ineffective to add large amounts of additional lighting to this area. This area is used to a large amount of traffic flow both pedestrian and vehicle therefore, the lighting at this particular location must serve a dual purpose.

However, for Mariemont the low impact bollard lighting (700.00) may provide a low impact option. Mariemont's nature preservation adds a beautiful aseptic feeling. Many users of the trail enjoy looking at the plant and wildlife. It is important to continue to preserve this environment for future use while simultaneously making the trail and a safe, comfortable detour for users. In this area the low bollards will give light to the trail but it is low enough to the ground to provide visibility but not to cause a major disruption to the preservation area. The 3M LED tube lighting stripe will offer visibility to outlining the path without causing a major impact to plant and wildlife. The tube lighting would not provide lighting like the bollards and may be considered both alone or in conjunction with each other. It is recommended for use in places that have a major change in ground elevation such as bridges around bass creek or near large dips next to the area such as by the rest area in Mariemont. The areas that

would be more considered for bollards would be the rest areas themselves to provide lighting to the amenity without major impact. Near the intersections of the path so that people are visible when entering and exiting.

The areas that require more lighting and have adequate sun light are good candidates for the solar powered pole light (900.00). One of the areas that would benefit greatly from this lighting option is the bridge over Red bank road. This bridge is setting well above a major roadway. It is not only important for the safety of the path user, but also the safety of those using the roadway. Rather than add more highway lighting which is an option that can be used in this instance because of the proximity to already existing lighting. Solar powered lighting is suggested because the area is open and way from interference. This option is not only a good environmental choice but a good financial one as well.

In areas where the path needs more defilement due to traffic but lighting is already present the 3M LED tube lite reflecting strips (500.00/20meter) may be an option. Lighting of this sort would be good at any of the intersections. It is low impact and relatively low in cost when applied to necessary locations. Intersections such as Wooster Pike, Columbia Parkway, as well as smaller intersections throughout the Hyde Park area would be primarily best practices locations. This will not only illuminate the path for the trail user but it would define the area for the drive showing that this a mixed usage area.



Boomsma, Christine, and Linda Steg. "Feeling Safe in the Dark: Examining the Effect of Entrapment, Lighting Levels, and Gender on Feelings of Safety and Lighting Policy Acceptability." *Environment and Behavior* 14 (2014): 193. *Ohio Link*. Web. 15 Feb. 2014. <<http://eab.sagepub.com/content/46/2/193>>.

Karuppannan, Sadasivam, and Alpana Sivam. "Social Sustainability and Neighbourhood Design: An Investigation of Residents' Satisfaction in Delhi." *Local Environment* 16.9 (2011): 849-70. Print.

Keane, Carl. "Evaluating the Influence of Fear of Crime as an Environmental Mobility Restrictor on Women's Routine Activities." *Environment and Behavior* 30.January (1998): 60-74. *Ohio Link*. Web. 15 Feb. 2014. <<http://eab.sagepub.com/content/20/1/>>.

Kuhn, L., M. Johansson, T. Laike, and T. Goven. "Residents' Perceptions following Retrofitting of Residential Area Outdoor Lighting with LEDs." *Lighting Research and Technology* 45.5 (2013): 568-84. Print.

Painter, Kate. "The Influence of Street Lighting Improvemnts on Crime, Fear and Pedestrian Streeet Use, after Dark." *Landscape and Urban Planning* 35 (1996): 193-201. Web.

Rails-to-Trails Conservancy:: Creating a Nationwide Network of Trails from Former Rail Lines:: Building Healthier Places for Healthier People." *Rails-to-Trails Conservancy:: Creating a Nationwide Network of Trails from Former Rail Lines:: Building Healthier Places for Healthier People*. N.p., n.d. Web. 11 Apr. 2014.

Schreuder, Duco. *Outdoor Lighting: Physics, Vision and Perception*. Dordrecht: Springer, 2008. Print.

Van Der Wurff, Adri, Leendert Van Staalduinen, and Peter Stinger. "Fear of Crime in Residential Environments: Testing a Social Psychological Model." *Social Psychology* 129.2 (2001): 141-60. *OhioLink*. Web. 18 Feb. 2014.

"Wasson Way." *Wasson Way*. Friends of Wasson Way, n.d. Web. 10 Apr. 2014.