| **Group** 13 | *Spring 2024 Design Challenge* |
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**Design Impact**

1. Cultural

One cultural benefit to implementing our system is the opportunity for further data transmission advancements. Li-Fi is a speed and efficiency improvement in comparison to most other wireless transmission methods and implementing such would lead to other improvements in the future. Moreover, real-time data can be transmitted to a website faster than with traditional methods using our system. One drawback of this technology would be that the physical space in which data is transmitted would have to be altered to be “in line of sight”.

1. Economic

A positive impact that Li-Fi has is the extremely low cost of components as compared to other wireless transmission methods. A negative economic impact of Li-Fi is that Wi-Fi companies will lose money as Li-Fi systems become more prevalent.

1. Environmental

One positive environmental benefit to the implementation of our system is that Li-Fi requires less power to operate than typical wireless transmission. This would make wireless transmission more energy efficient if widely used. Unfortunately, light transmission on a large scale would alter the habitats of local wildlife as animals would be drawn to transmission sources if they can be reached.

1. Global

One positive of our system globally is that the transmission medium is cheaper and therefore more accessible to areas with fewer resources for wireless transmission.

1. Public health

One positive of the Li-Fi system regarding public health is that there is no radiation emission compared to popular Wi-Fi systems. This can prevent several health concerns that come with radiation exposure. Additionally, medical professionals could benefit from faster-transmitting speeds when dealing with public health emergencies.

1. Public safety

One positive of the Li-Fi transmission system safety-wise is that there will be no interception of sensitive data as it is encrypted. Another positive of Li-Fi transmission is that it is a more secure transmission medium as intercepting light waves will always be obvious to a direct viewer. Additionally, public safety professionals could benefit from faster-transmitting speeds when dealing with safety emergencies.

1. Public welfare

A positive public welfare benefit of LiFi is that it is very cheap and affordable compared to Wifi which can benefit low-income citizens and families that need internet connection. One negative of the system would be the immediate cost of changing from WiFi to Li-Fi for the public.

1. Social

One positive social effect would be the communication aspect that Li-Fi addresses. Li-Fi has high data transfer speeds and can be extremely effective regarding digital communication.