6.1800 Peer Review - GreenBike

In this paper I respond to the GreenBike system and observe the design and evaluation of the system as outlined in the preliminary report. By analyzing the overview of their system, evaluations, and tradeoffs, I aim to offer my own feedback and insight to the system's design. GreenBike identifies three primary design values that inform their design: operational efficiency, privacy, and accessibility. The following sections evaluate the system based off of these specified design values, the design choices and tradeoffs made in the system's design, and offer critiques and possible solutions to their design.

GreenBike limits the number and time of reservations for bikes and docks to improve accessibility (pg. 9-10), but does not specifically state how it ensures a dock is available when a user makes a reservation to return a bike. One potential solution would be to aim for a certain percentage of docks to be empty and utilizing the Angel system to maintain this percentage at all stations.

Although the preliminary report does not specifically detail how it handles behavior surges of simultaneous returns near a superstation, it does mention that surges of reservation requests are supported due to maximizing the number of open connections by choosing to not support direct bike to central computing communication (pg. 21). Following this, I think it would have been beneficial to extend this logic to all types of requests (including returns) and state that the system could likely handle an influx of returns.

The GreenBike system makes several design decisions and tradeoffs which connect to their design values. To support operational efficiency the system utilizes a centralized system with six modules which perform functions related to the basic functionality of the bike-share system as well as three additional components which support seamless data communication, data encryption, and user-system interaction (p. 2-3). The report initially describes all of these as nine *modules* and specifies that the Communication, Encryption, and User Interface modules are *components*, but it uses these terms interchangeably and would benefit from additional clarification of the differences of the modules and components. The system also chooses to aggregate ride data and not share recreational video data with Newplace officials in order to support privacy, although it would be insightful to explain why aggregate ride data would be sufficient for important decisions (pg. 21)

For evaluations, the report provides calculations for quantities such as the amount of time to transfer video data, the amount of time required to recover from a network partition or outage, and the scalability and total storage required for the system (pg. 15-22). Several of these, such as the estimated time to transfer videos from bike to station and from station to central computing, support operational efficiency by demonstrating how quickly videos can be sent through the system. However, I think that some evaluations in support of privacy and accessibility (for example, rate of bike/dock availability per station) would have been beneficial.

The GreenBike system preliminary report provides a well-defined overview of the system and provides easy-to-find justifications for design decisions and tradeoffs which connect to the design principles they support. Some additional explanations for design choices, such as choosing to aggregate ride data for data sharing, would strengthen the report further. Overall, GreenBike utilizes design decisions which support operational efficiency, privacy, and accessibility as a bike-sharing system.