Smart Grid Proposal

Cypress Creek 01
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Background Information

What is a Smart Grid?

- A smart grid is similar to a traditional grid, however, instead of just using a network of physical lines, it uses modern day, digital technology to efficiently split power.

What is a Microgrid?

- A microgrid models out a group of connected power sources and resources on a smaller scale.

Background Information

How does a Smart Grid Work?

- Smart Grids uses devices such as computers to quickly respond to the requests of an electric grid.

How do Smart Grids Help?

- They help better prepare for natural disasters, by utilizing a fault tolerant system. This means, even if one way of rerouting power is disrupted, another route can be used.

Background Information

How can Power Outages be Prevented?

- Power outages can be prevented by redirecting power if one line goes down, instead of the entire area going down as well.

Ways Power can be Restored.

- A generator can be used to restore power.
- The electrical company will restore power to transmission lines, substations, and main circuit lines. Lastly, they will also repair the individual service lines connected to homes.

Design Process

What We Choose as our Priorities and Why.

- We chose schools, hospitals, grocery stores, senior living centers, gas stations, police stations, fire stations, sewage treatment plants, drug stores, and internet providers.
- These users were chosen as priorities because they are vital to the process of restoring communities.

Design Process

Data from our Research

- Hospitals and grocery stores were within the same range of power and had the highest use of power. Then senior living centers, fire stations, police stations, and schools were in the middle range. Lastly, gas stations, drug stores, internet providers, and sewage treatment plants fell into the lowest range.

Design Process

Analysis of Our Data

- The highest range of our data were places that took so much power due to their purpose.
- The middle range of our data took a good amount of power too, on account of how power mostly happened mostly on site.
- Finally, the lowest range of our data was mostly going to be high on our list, however they didn't use much power because they work outside of their structure.

Design Process

How We Ranked Our Priorities

- We chose the ranking based on how necessary the energy user would be to ensure most people would be safe. For instance, the importance of first responders like hospitals, fire stations, and police stations.

Our Design

Description of our Design

- In our design areas that are represented with red are the most important. Followed by yellow as medium importance. And ultimately, green is least important.

Why Us?

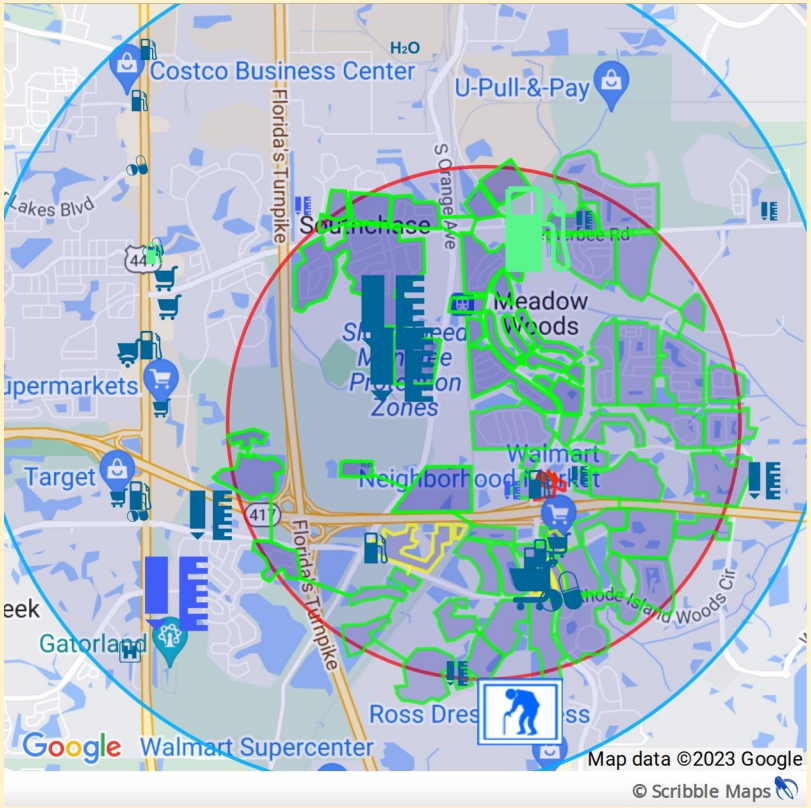
- We believe that our design is efficient due to the fact there aren't many very important areas, so there isn't lots of factors to worry about. Which leads to the amount of power going to our priorities to be a decent amount.

Our Design

Process of Mapping Our Design.

- We first chose an area that had a cluster of things to choose from. Then based on the priority of the type of infrastructure, the color for it would be chosen. For example, a hospital is higher priority so it would be colored red. While a lower priority such as residential areas would be green. We made sure to include multiple paths for redundancy.

Visual Representation of our Design



Our 1.5 mile radius of mapped out power sources.

References

“Microgrids.” NREL.gov, http://www.nrel.gov/grid/microgrids.html.

“Smart Grid: The Smart Grid.” Smart Grid: The Smart Grid | SmartGrid.gov,

16 Dec. 2019,https://www.smartgrid.gov/the_smart_grid/smart_grid.html.

Penman, Li. “How to Prevent a Power Outage.” Jim's Test & Tag,

13 July 2022 https://www.jimstestandtag.com.au/how-to-prevent-a-power-outage/.

“How Power Is Restored.” Pioneer Electric, https://pioneerelectric.coop/resources/how-power-is-restored/.

Thank You.
Any questions?