Experience Expo 2024

Powering the Future: Optimizing EV Charging Networks

Northeastern University

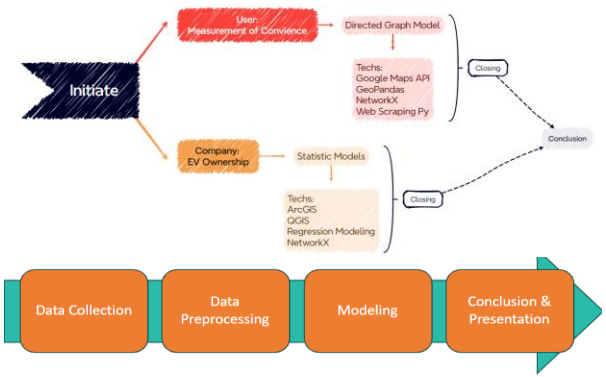
Introduction

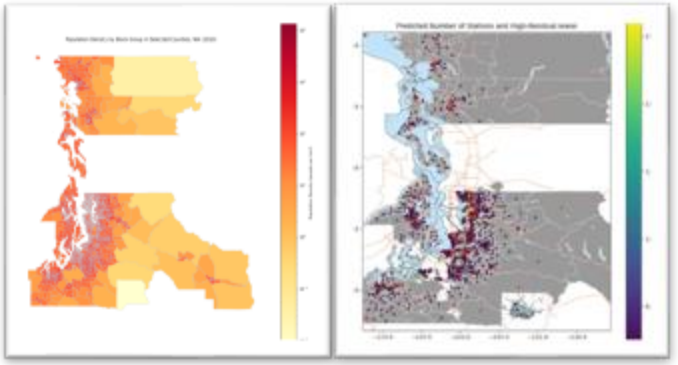
Electric Vehicle Gap Analysis includes identifying lack of infrastructure of EV chargers where it is high needed in Puget Sound Energy (PSE)'s service area.

Problem Statement

The project should identify the areas in PSE's electric service area with inadequate access to charging infrastructure. The ideal deliverable would be a geodatabase containing the data and conclusion regarding the gaps' in EV infrastructure as well as a summary slide deck giving an overview of the methodology and outputs.

Methodology





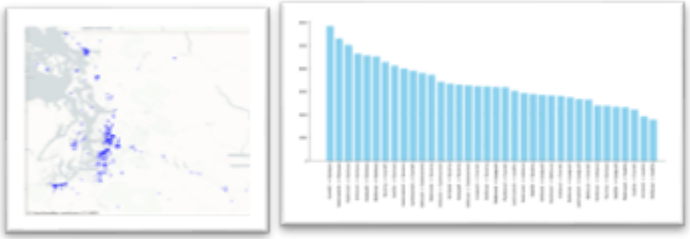
Data Overview

Tools

- Web Scraping For Data Integration
- Python Panda for Data Cleaning
- Google Geo API
- Directed Graph Modeling
- ArcGIS, QGIS Layer Construction
- Geo Spatial Regression Model

Solutions

Prioritize new charging stations in high-density urban areas to meet immediate demand. Focus on high-traffic areas with low existing station density, emphasizing underserved regions with high AADT.



Next Steps

Home/private chargers → Common routes and destinations → Competitor

Conclusion

- **Urban Areas:** High traffic urban regions have good EV charging coverage.
- **Rural & Suburban Areas:** Significant gaps in charging infrastructure.
- **Key Routes:** Critical routes identified for additional stations to reduce travel time.
- **Strategic Focus:** Focus on underserved areas to ensure a balanced, accessible charging network.

References

1. US Census: https://www.census.gov/
2. NHGIS: https://www.nhgis.org/
3. PlugShare: https://www.plugshare.com/
4. US Department of Energy: https://www.energy.gov/

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