Bike Infrastructure in Chicago

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Guiding Questions

Questions this project attempted to answer were:

- Which community areas (neighborhoods) in Chicago have the most bike infrastructure, and which have the least?
- Are there areas that show an unmet demand for bike infrastructure?
- Can I predict bike infrastructure levels based on demographic data?

Background

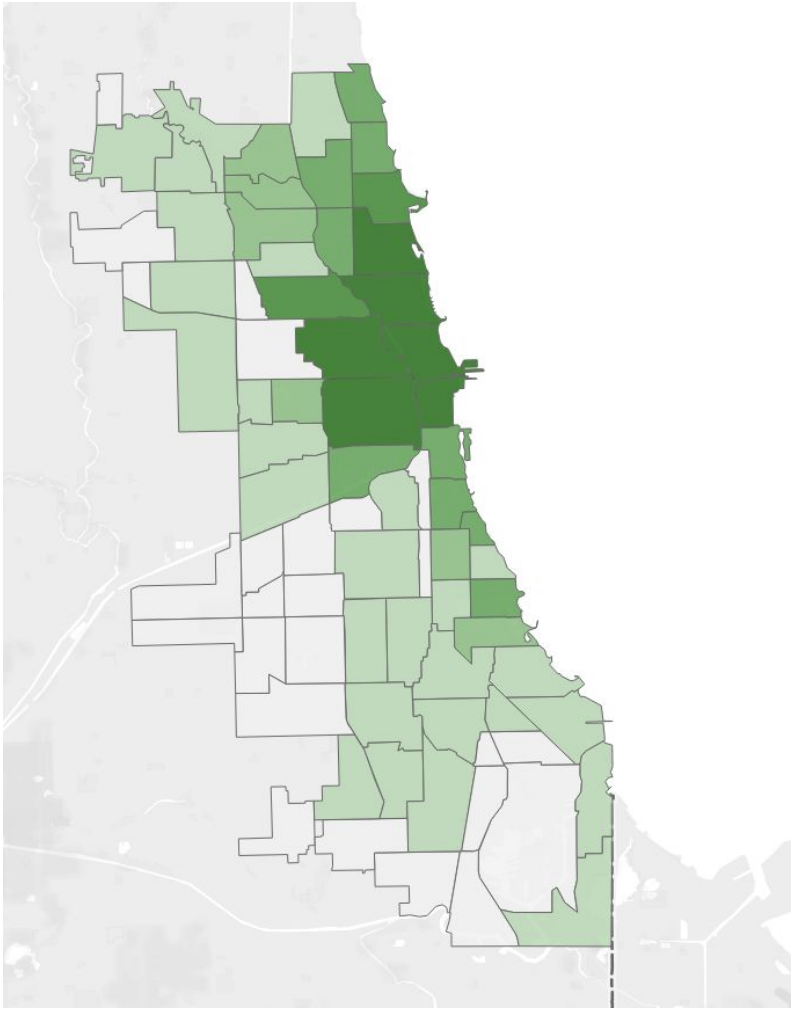
- Chicago is divided into 77 official “Community Areas”
- They typically represent 1-3 neighborhoods grouped together

Why choose Community Areas for my analysis?

- Easiest way to convey neighborhood information to typical Chicago residents
- More static and concise than Wards

Bike Infrastructure

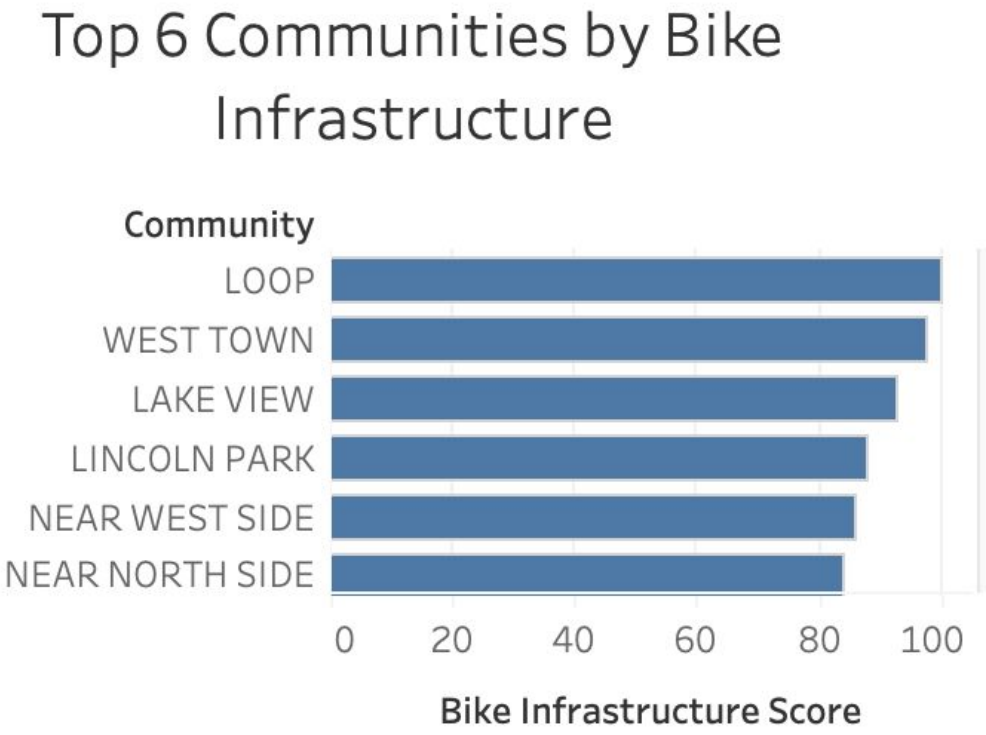
- Bike Lanes
- Bike Shops (repair and sales)
- Bike Racks
- Divvy Stations (bike sharing program)



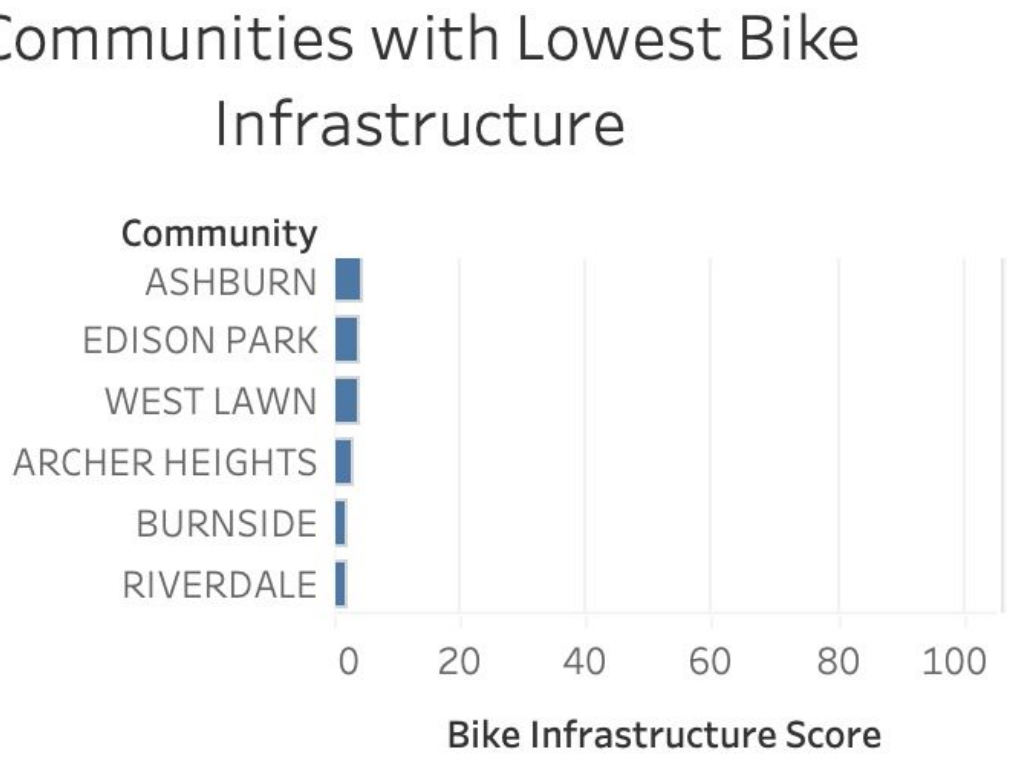
Results

- Darker green = higher bike infrastructure score
- See Tableau Dashboard for more detailed map [link]

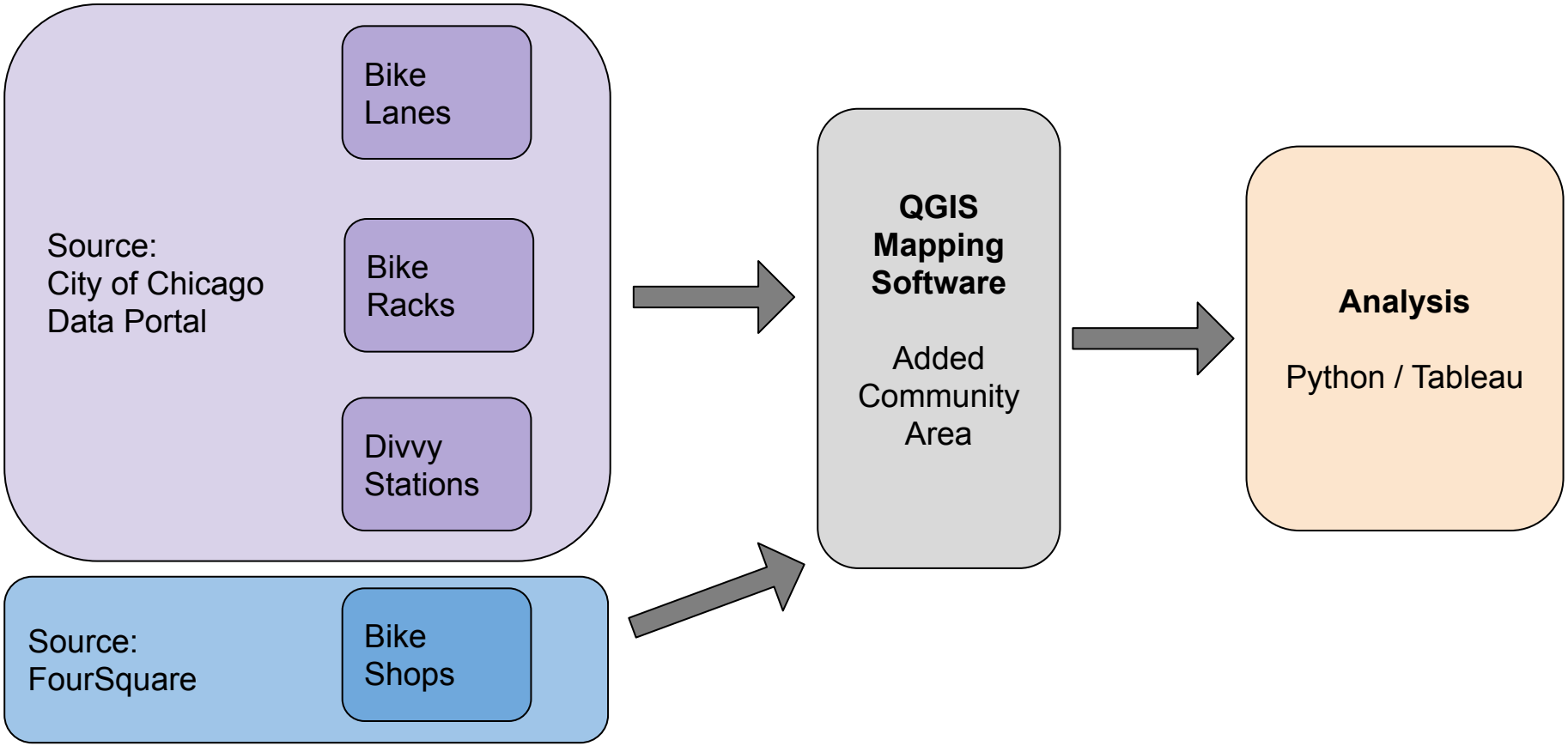
Results


Top 6 Communities by Bike Infrastructure
Community
LOOP
WEST TOWN
LAKE VIEW
LINCOLN PARK
NEAR WEST SIDE
NEAR NORTH SIDE
0
20
40
60
80
100
Bike Infrastructure Score

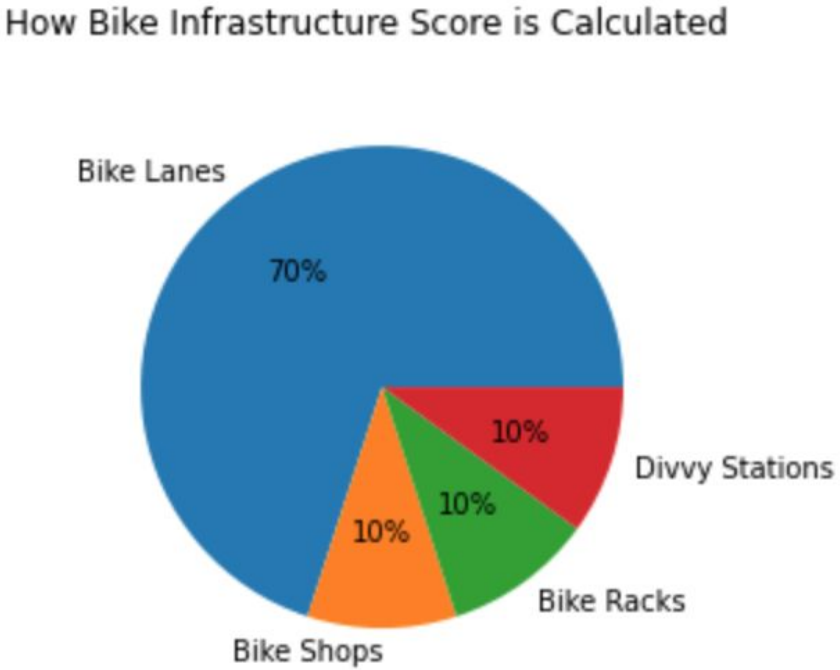
Results


Communities with Lowest Bike Infrastructure
Community
ASHBURN
EDISON PARK
WEST LAWN
ARCHER HEIGHTS
BURNSIDE
RIVERDALE
0
20
40
60
80
100
Bike Infrastructure Score

Data Sources and Processing



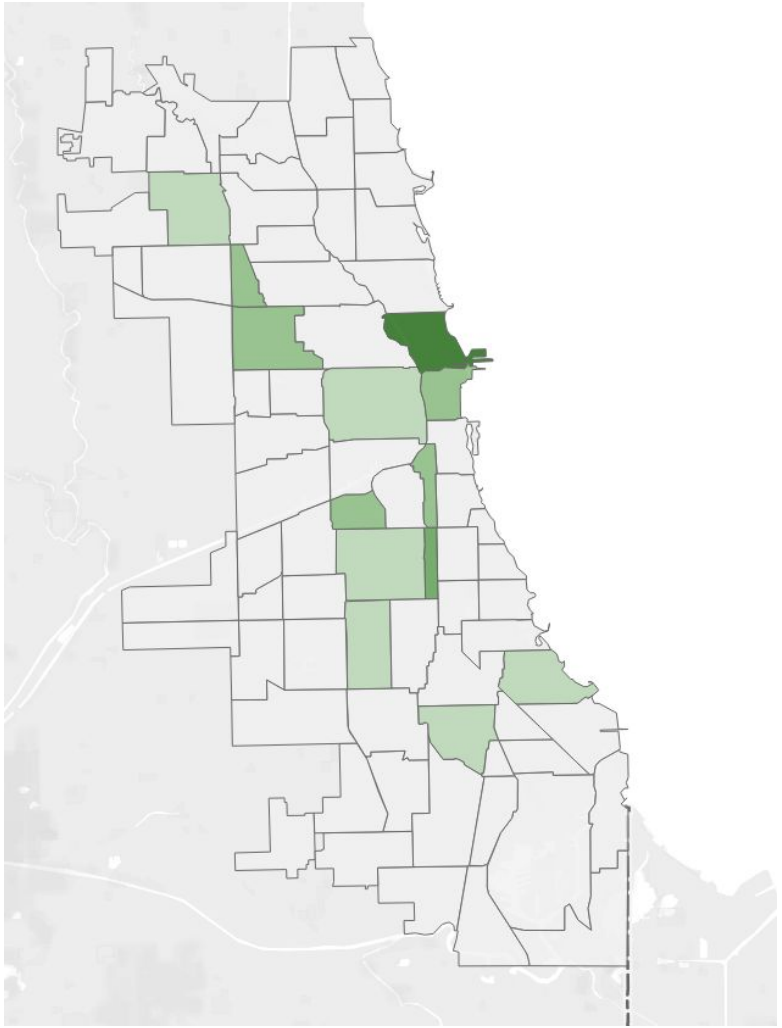
Bike Infrastructure Score Calculation



- Bike Lanes were calculated as a percent of total length of street within community area
- Bike Shops, racks and Divvy stations were calculated per capita within community area
- These calculations were then normalized and combined into a score 0-100

Bike Infrastructure Need Calculation

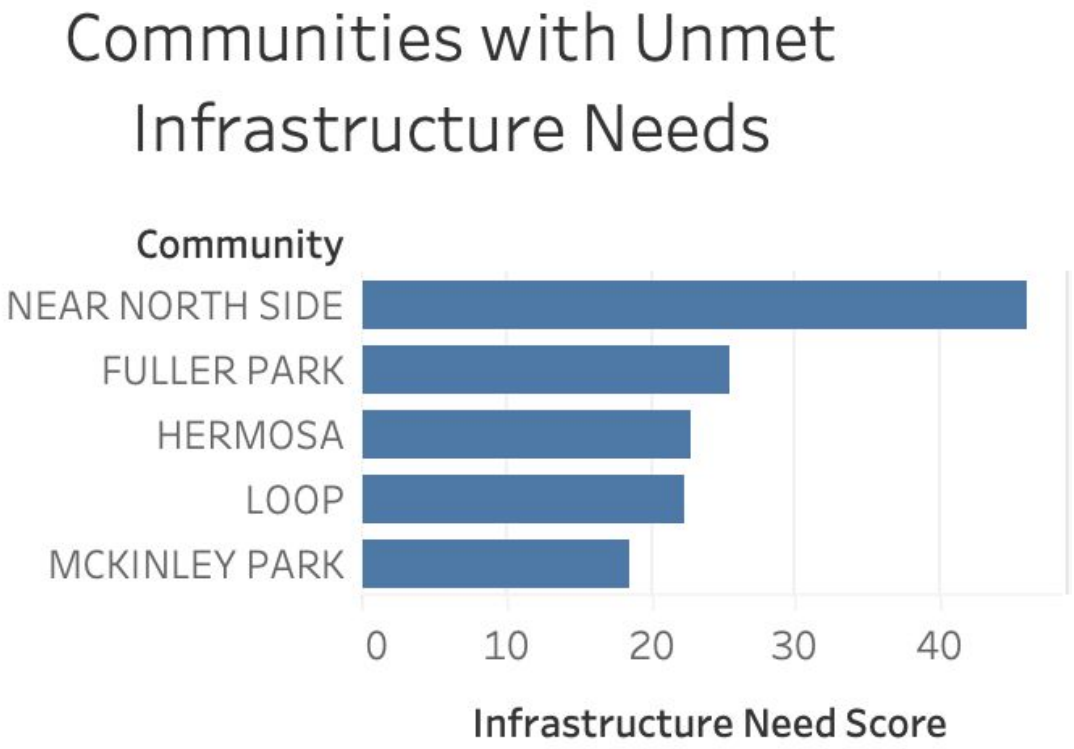
- To calculate comparative need for bike infrastructure, I used Divvy bike trips as a proxy for bike usage within a community
- I sampled the Divvy trip data, and used the month of June 2019 for my calculations
- [Bike Usage Score] - [Bike Infrastructure Score] = Need



Infrastructure Need Results

- Darker green = higher bike infrastructure need score
- See Tableau Dashboard for more detailed map [link]

Results

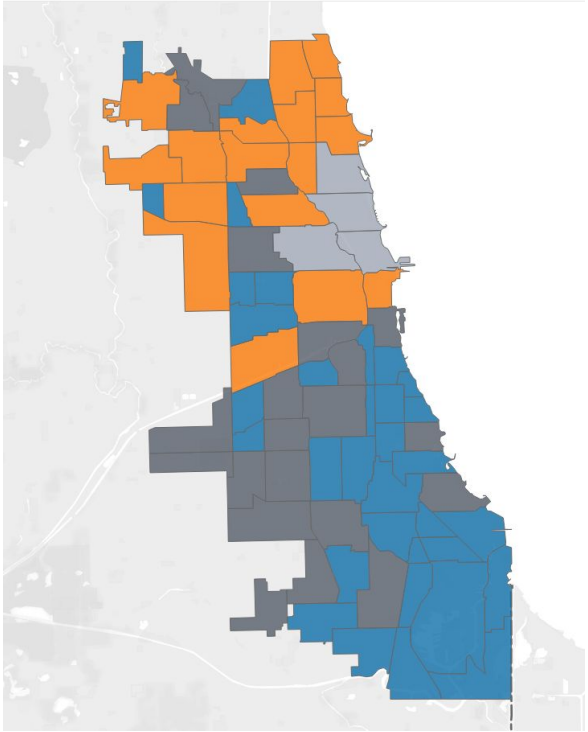

Communities with Unmet Infrastructure Needs
Community
NEAR NORTH SIDE
FULLER PARK
HERMOSA
LOOP
MCKINLEY PARK
0
10
20
30
40
Infrastructure Need Score

Machine Learning

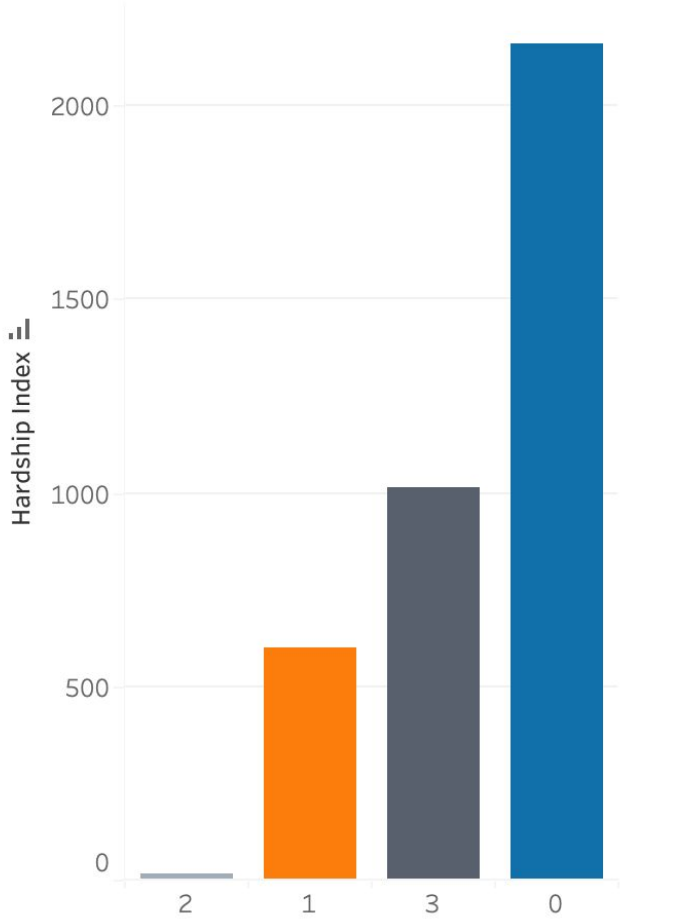
- As machine learning was a requirement of my project, I applied K Means clustering to the community areas using demographic data
- The communities were clustered into 4 groups, according to similar demographic data

Machine Learning Results

Map of Clusters

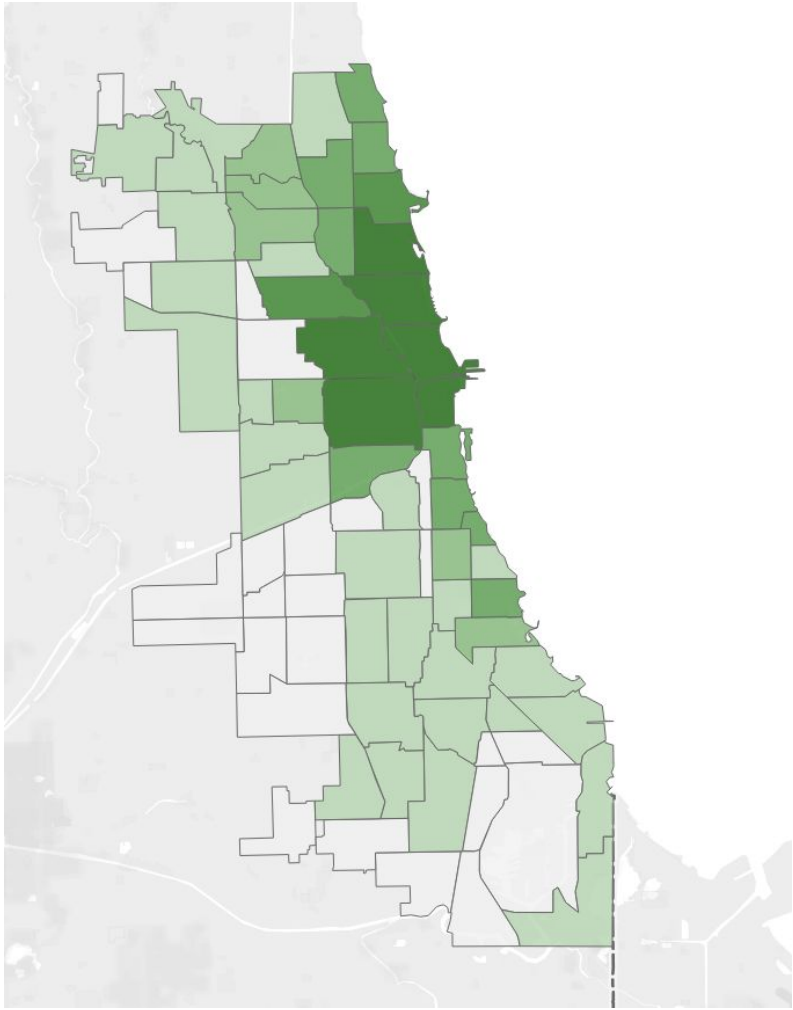


K Means Clusters by Hardship Index



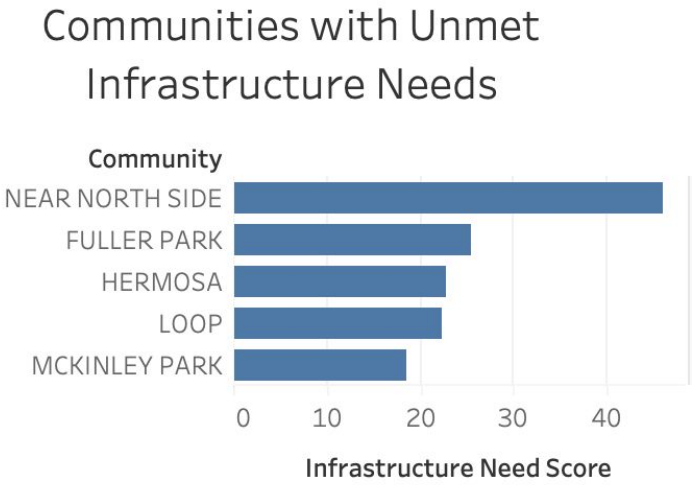
Conclusion

- Bike infrastructure is not evenly distributed throughout the city
- The neighborhoods on the north side of the city, as well as along the lake, have more bike infrastructure



Conclusion

- The Near North Side has a strong need for more bike infrastructure, namely more bike lanes
- Other areas (Fuller Park, Hermosa) would benefit immediately from more bike infrastructure



Limitations

- No bike lane usage data was available - Divvy trips were used as a proxy, but not all cyclists use Divvy
- Bike infrastructure score as calculated in an arbitrary way (based on my experience as a cyclist in Chicago and interviewing others)
- Community areas are good for communicating with the public, but aldermanic wards are probably a better way if the goal is to add more bike lanes

Further Directions

- Update data are more bike lanes are installed and maps are updated
- Analyze data by wards in order to communicate with member of City Council