Valuing Neighborhoods in Chicago

THIS PROJECT WILL FOCUS ON DETERMINING THE LOCATIONS IN CHICAGO THAT A NEW HOME BUYER WILL HAVE THE HIGHEST LIKELIHOOD OF RETAINING PROPERTY VALUE BASED ON THE CHARACTERISTICS OF THE SURROUNDING NEIGHBORHOOD.

Interest

This project will potentially be of interest to:

- New Chicago home buyers
- Chicago real estate and real estate investment firms
- Chicago municipal departments focused in community development
- Chicago small business owners

Data

The city of Chicago is divided into 77 Community Areas. These areas can be used as feature groups of different variables to gain insight into the characteristics of the area.

Data Elements

- Community Area
- Population
- Median Household Income
- Mortgage Activity Rate
- Foreclosure Activity Rate
- Poverty Rate
- Tree Canopy
- Venues and Facilities

Data Sources

- Wikipedia.org
- HousingStudies.org
- Edirepository.org

---Tree Data Citation---
link:https://portal.edirepository.org/nis/mapbrowse?packageid=knb-lter-bes.5008
Citation: Locke, D.H. 2020. Residential housing segregation and urban tree canopy in 37 US Cities;data in support of Locke et al 2020 in npj Urban Sustainability ver 1. Environmental Data Initiative.https://doi.org/10.6073/pasta/907a557cac781eb4cf72f866a2903c04 (Accessed 2021-03-01).
---Housing Data Citation---
link:https://www.housingstudies.org/data-portal/browse/?indicator=poverty-rate&area=chicago-community-areas&view_as=view-table
link:https://www.housingstudies.org/data-portal/browse/?indicator=total-foreclosure-activity&area=chicago-community-areas&property_type=0&view_as=view-table

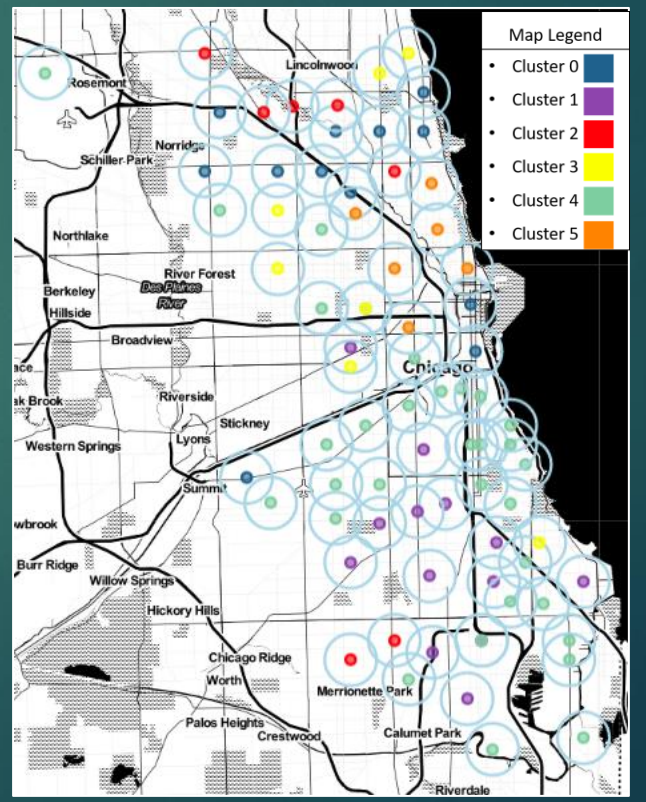
Data Selection

- The selection of these specific elements was done by searching the qualities that new home buyers look for in a neighborhood.
  - The though being that the higher the income, tree canopy and mortgage activity, the more attractive the neighborhood is to the general population, and subsequently the properties there are more valuable.
  - The opposite thought being that the higher the foreclosure rate and lower the income and tree canopy, the lower the perceived value of the neighborhood.
- The level of foreclosure activity, mortgage activity, population size, income/poverty levels and tree canopy will be the primary clustering set for the neighborhoods.
- Note: Chicago is a notoriously violent city, but I have deliberately left out all demographic data and crime statistics (even though I originally included it) to try to level the obvious bias of the clustering.

Community Area Clustering

- The cluster map on the right shows the six clusters.
- Above is a table of the clustering elements averaged for the respective cluster.
- This table is sorted on 'F_to_M', which is the average Foreclosures to Mortgages ratio for the community areas in the cluster
- Highlighted by the divisions in red, it is plain to see there is a large difference between clusters 5,2,0 and 3,4,1.

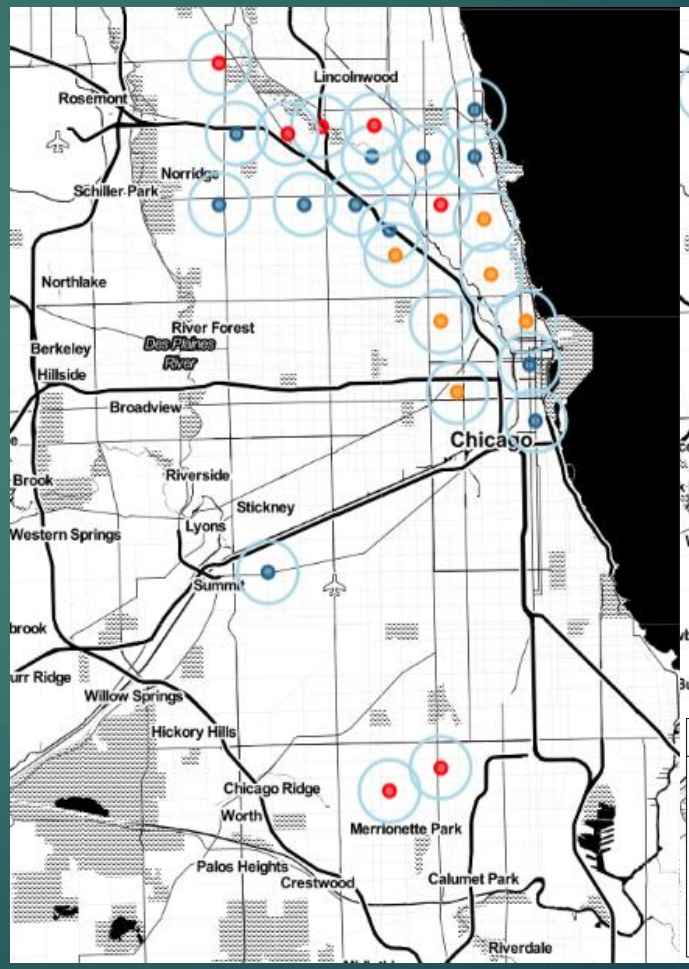
clus	Population	Poverty	Forclosures	Mortgages	Income	TreeCover	F_to_M
5	80725.333333	9134.070500	184.666667	8338.666667	92215.000000	19.601560	0.022151
2	21655.571429	1480.737857	91.714286	2113.142857	88921.285714	30.561541	0.043402
0	45562.500000	5399.229417	151.500000	3465.000000	68186.765152	17.079920	0.043723
3	69150.714286	17222.681714	384.000000	2599.857143	39794.597403	20.856551	0.140008
4	18645.062500	4076.919969	118.812500	813.843750	39574.750000	17.159290	0.145989
1	34265.307692	9135.112923	477.384615	1470.769231	34070.783217	21.694207	0.324582



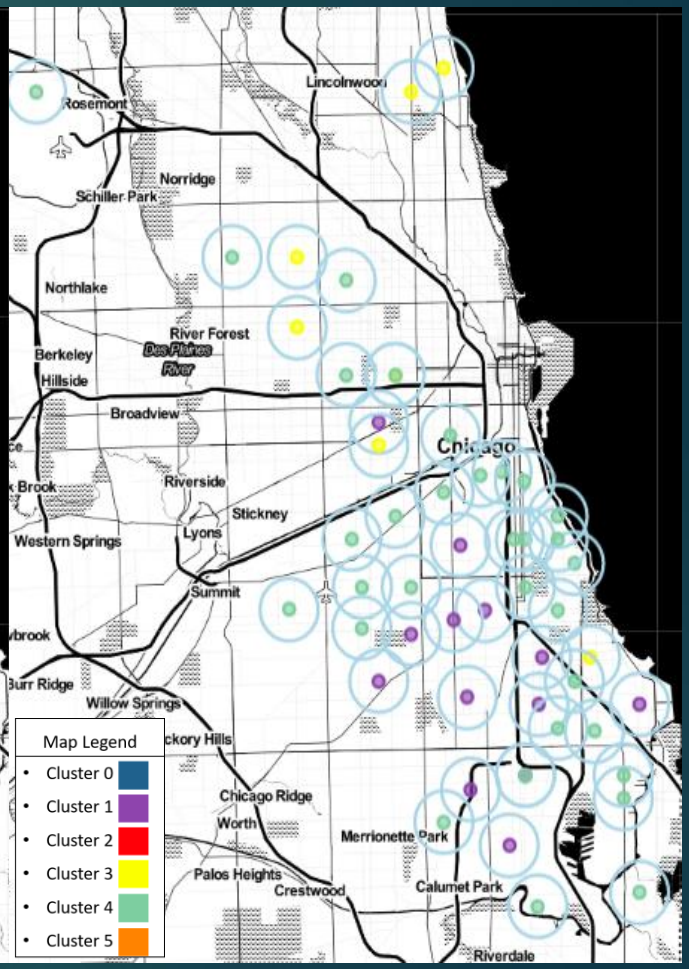
Cluster Analysis

- When viewing these as two separate groups of clusters, it is easy to see the geographic separations
- Note: It is not surprising that it should be north and south, as Chicago's south side has a reputation that is notorious worldwide. However the pockets of neighborhoods in the positive grouping that are outside the northern half of the city are interesting, as they show movement to develop new areas of value outside of the established most expensive communities.

Perceived Higher Value
Clusters 0 2 5



Perceived Lower Value
Clusters 1 3 4



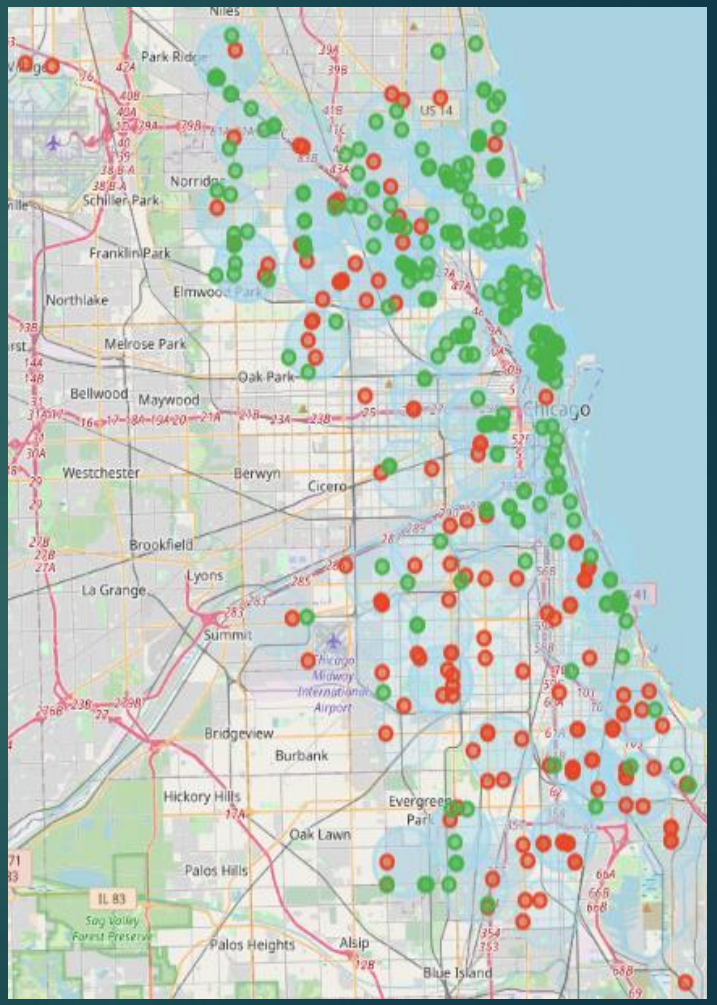
Venues in Community Areas

- Three correlation tables below were used to help determine the venue groupings to check. (Sorting Circled in Red)
- These tables highlight venue types that show the highest correlation to Income, Mortgages, and Foreclosures respectively.
- Highest correlation values, as well obvious positive and negative elements (i.e. playgrounds being positive, factories being negative) were used to create a categorized map to see separations. Positive(green) negative(red).

	Poverty	Forclosures	Mortgages	Income
Income	-0.269093	-0.223254	0.670603	1.000000
Italian Restaurant	-0.159296	-0.237101	0.577470	0.685410
Mortgages	0.253647	0.104134	1.000000	0.670603
French Restaurant	-0.070403	-0.136996	0.382434	0.470583
New American Restaurant	0.014177	-0.160386	0.637974	0.464043
Beer Garden	-0.173391	-0.151553	0.154179	0.458813
Mediterranean Restaurant	-0.007979	-0.168370	0.394180	0.453341
Pub	-0.215925	-0.182898	0.214356	0.446854
Salon / Barbershop	0.010946	-0.034896	0.417963	0.419293
Toy / Game Store	-0.018953	-0.022842	0.394279	0.417235

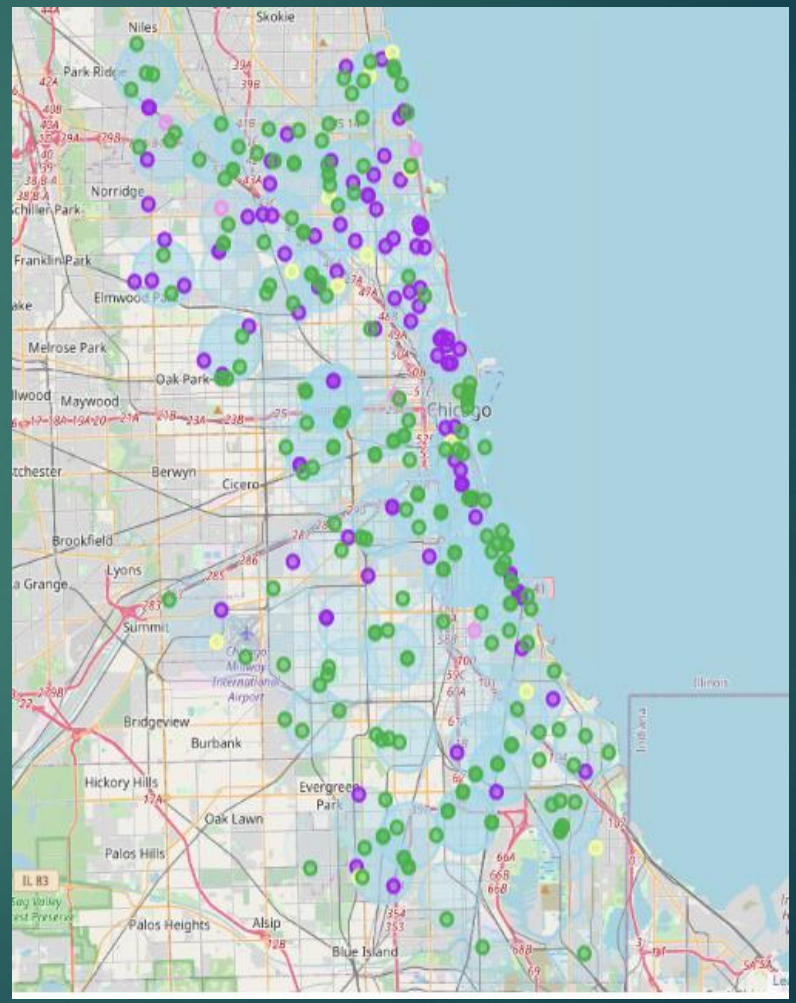
	Poverty	Forclosures	Mortgages	Income
Mortgages	0.253647	0.104134	1.000000	0.670603
Population	0.698121	0.350474	0.813885	0.340984
Income	-0.269093	-0.223254	0.670603	1.000000
New American Restaurant	0.014177	-0.160386	0.637974	0.464043
Cycle Studio	0.066618	0.018520	0.582621	0.285568
Italian Restaurant	-0.159296	-0.237101	0.577470	0.685410
Japanese Restaurant	0.027837	-0.128305	0.570518	0.283520
Brazilian Restaurant	0.147336	-0.036800	0.505907	0.291020
Hostel	0.033778	-0.040824	0.493646	0.340177
Music Venue	0.015317	-0.111570	0.490283	0.364918

	Poverty	Forclosures	Mortgages	Income
Forclosures	0.545242	1.000000	0.104134	-0.223254
Poverty	1.000000	0.545242	0.253647	-0.269093
Discount Store	0.199593	0.537711	-0.338347	-0.466332
Fast Food Restaurant	0.122884	0.468881	-0.334026	-0.432946
Currency Exchange	0.271231	0.460968	-0.047620	-0.217297
Fried Chicken Joint	0.065505	0.379511	-0.236340	-0.295624
Population	0.698121	0.350474	0.813885	0.340984
Fish & Chips Shop	-0.042340	0.315353	-0.077093	-0.076614
Convenience Store	0.026426	0.294519	-0.079979	-0.080689
Pharmacy	0.163515	0.285346	-0.238089	-0.236009



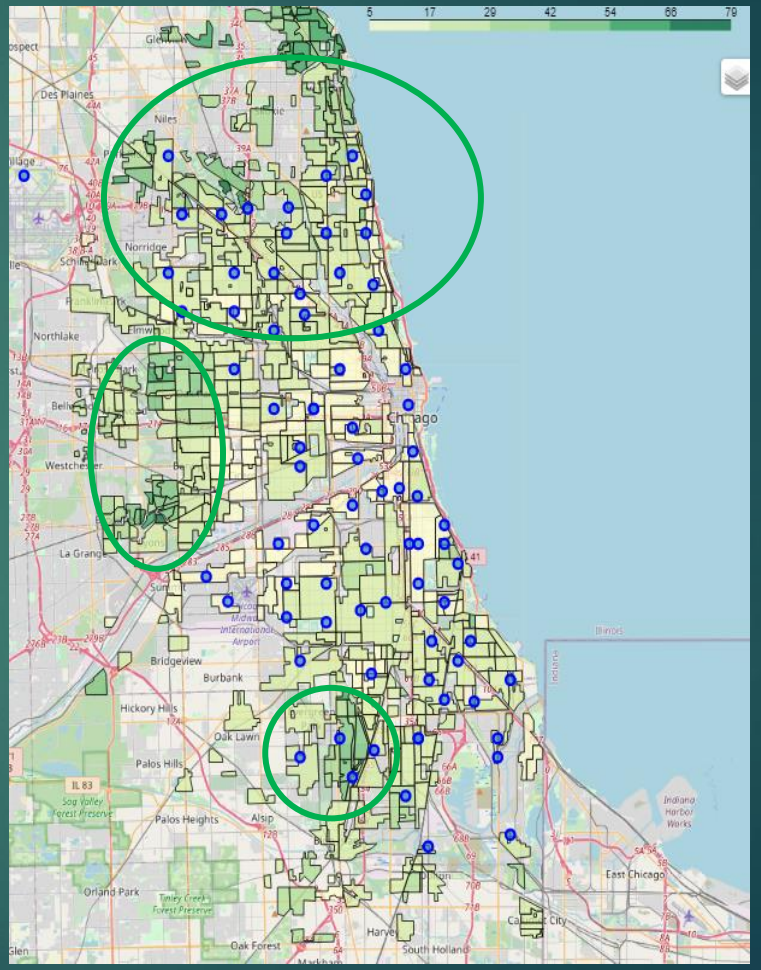
Venues in Community Areas (cont.)

- In addition, a similar map was generated to visualize the location distribution of some of the most desirable public facilities and venues.
- This included:
  - Parks(green)
  - Gym/Fitness Centers(purple)
  - Playgrounds(yellow)
  - Dog Parks(pink)
- The map to the right shows the location of public parks are plentiful throughout the city of Chicago. However, fitness centers, dog parks and playgrounds have a very skewed distribution to the same three community clusters highlighted earlier (5, 2 and 0).



Tree Canopy

- Another thing of note is the tree canopy percentages per area
- Shown in the map to the right, it is visible that the community areas that average higher income, mortgage rates and have less foreclosures have a higher percentages of tree canopy.
- This obviously disregards the city center, as there is not much room for copious amounts of trees in downtown Chicago



Conclusions

- The results show that based on the analysis done, that the community areas contained in clusters 5, 2, and 0 will have higher perceived value from the average consumer.
- Buying a home in one of these three clusters would have a higher likelihood of appreciating in value than would buying in one of the other three clusters.
- This conclusion is based on the communities in clusters 5, 2, and 0 averaging much higher income levels and mortgage activity while being substantially lower in foreclosures relative to the other three clusters.
- In addition, and most likely due to the previous, the venues located in these three clusters are indicative of higher neighborhood value, and subsequently higher property values.

Closing Notes

- I would like to clarify that this conclusion is drawn from a completely objective and data-based standpoint. If you were to look at the demographic make-up of the clusters, the lower perceived value community areas are home to a much higher percentage of minorities and people of color . Demographics were specifically not used, and the goal was to see houses strictly in the capacity of that of an asset. In order to accurately assess risk and valuation for the specific kind of asset that is property, determining the effect that the asset's location has is paramount in assuring the best return on invest. In no way shape or form is this project a comment on, or a valuation of; people, culture or community.