GEORGE MASON UNIVERSITY, FAIRFAX, VA.

REPORT ON

AFFORDABLE RENTAL HOUSING DEVELOPMENTS

INTRODUCTION

The provision of affordable housing remains a pivotal concern for metropolitan areas worldwide, with Chicago serving as a notable example. Addressing this imperative, our project embarks on an examination of an extensive dataset delineating affordable rental housing developments across diverse community areas within the city. This dataset comprises essential details, including community area names and numbers, property types, addresses, and geographic coordinates. Utilizing rigorous statistical analysis and advanced visualizations, our goal is to comprehensively explore Chicago's affordable housing landscape. Through meticulous examination of distribution patterns and trends in the dataset, we aim to shed light on the nuanced complexities of the city's affordable housing market, informing decision-making in housing policy and planning.

Our project's main objectives involve utilizing a variety of statistical methods to identify significant patterns and trends within Chicago's dataset of affordable rental housing developments. From basic descriptive statistics to advanced spatial analysis, every aspect of our approach is meticulously tailored to ensure clear, comprehensive, and accurate findings. Our overarching goal is to furnish stakeholders with a thorough understanding of the city's affordable housing landscape, supported by diverse visualization techniques for geographic and spatial analysis.

DATA ANALYSIS

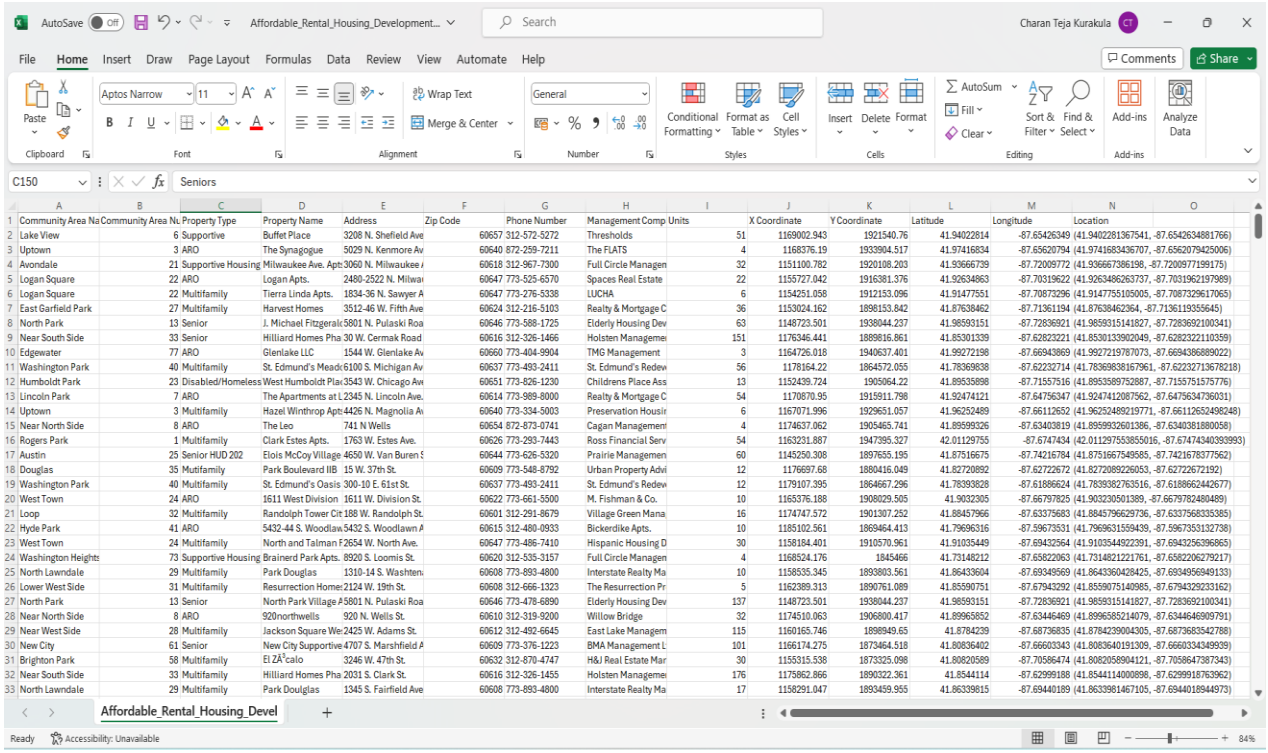
The analysis involved gathering data from housing management entities in Chicago, followed by meticulous data cleaning. Exploratory data analysis was conducted using various visualization techniques to understand property type distribution, identify outliers, and examine relationships. The findings revealed a diverse range of housing properties across different community areas, with multiple management companies involved, and spatial analysis provided insights into geographic distribution and accessibility.

RESEARCH QUESTIONS:

- Can we identify clusters or patterns of property types across different community zones?
- Are there specific geographical areas with a higher density of affordable housing units?
- Is there a correlation between the number of units and the type of property in the affordable rental market?

DATASET:

Our dataset is about Affordable Rental Housing Developments in the city of Chicago. The size of the dataset is about 115KB.

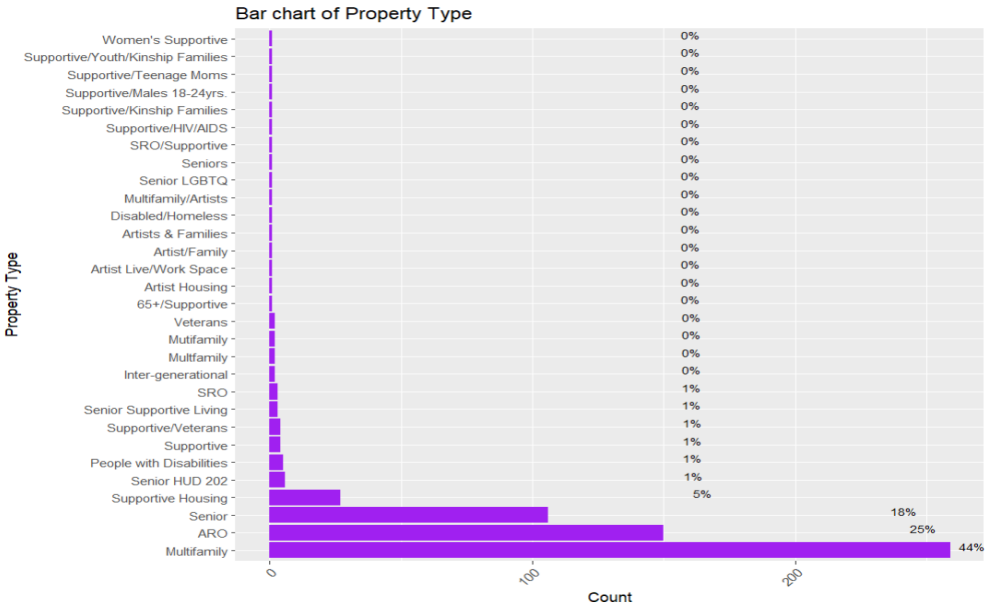


Community Area Na	Community Area Nu	Property Type	Property Name	Address	Zip Code	Phone Number	Management Comp	Units	X Coordinate	Y Coordinate	Latitude	Longitude	Location
Lake View	6	Supportive	Buffet Place	3208 N. Shefield Ave	60657	312-572-5272	Thresholds	51	1169002.943	1921540.76	41.94022814	-87.65426349	(41.9402281367541, -87.6542634881766)
Uptown	3	ARO	The Synagogue	5029 N. Kenmore Av	60640	872-259-7211	The FLATS	4	1168376.19	1933904.517	41.97416834	-87.65620794	(41.9741683436707, -87.6562079425006)
Avondale	21	Supportive Housing	Milwaukee Ave. Apts	3060 N. Milwaukee A	60618	312-967-7300	Full Circle Managen	32	1151100.782	1920108.203	41.93666739	-87.72009772	(41.936667386198, -87.7200977199175)
Logan Square	22	ARO	Logan Apts.	2480-2522 N. Milwa	60647	773-525-6570	Spaces Real Estate	22	1155727.042	1916381.376	41.92634863	-87.70319622	(41.9263486263737, -87.7031962197989)
Logan Square	22	Multifamily	Tierra Linda Apts.	1834-36 N. Sawyer A	60647	773-276-5338	LUCHA	6	1154251.058	1912153.096	41.91477551	-87.70873296	(41.9147755105005, -87.7087329617065)
East Garfield Park	27	Multifamily	Harvest Homes	3512-46 W. Fifth Ave	60624	312-216-5103	Realty & Mortgage C	36	1153024.162	1898153.842	41.87638462	-87.71361194	(41.87638462364, -87.7136119355645)
North Park	13	Senior	J. Michael Fitzgerald	5801 N. Pulaski Roa	60646	773-588-1725	Elderly Housing Dev	63	1148723.501	1938044.237	41.98593151	-87.72836921	(41.9859315141827, -87.7283692100341)
Near South Side	33	Senior	Hilliard Homes Pha	30 W. Cermak Road	60616	312-326-1466	Holsten Managemer	151	1176346.441	1889816.861	41.85301339	-87.62823221	(41.8530133902049, -87.6282322110359)
Edgewater	77	ARO	Glenlake LLC	1544 W. Glenlake Av	60660	773-404-9904	TMG Management	3	1164726.018	1940637.401	41.99272198	-87.66943869	(41.9927219787073, -87.6694386889022)
Washington Park	40	Multifamily	St. Edmund's Meadc	6100 S. Michigan Av	60637	773-493-2411	St. Edmund's Redev	56	1178164.22	1864572.055	41.78369838	-87.62232714	(41.7836983867961, -87.6223271367821)
Humboldt Park	23	Disabled/Homeless	West Humboldt Pla	3543 W. Chicago Ave	60651	773-826-1230	Childrens Place Ass	13	1152439.724	1905064.22	41.89535898	-87.71557516	(41.8953589752887, -87.7155751575776)
Lincoln Park	7	ARO	The Apartments at L	2345 N. Lincoln Ave.	60614	773-989-8000	Realty & Mortgage C	54	1170870.95	1915911.798	41.92474121	-87.64756347	(41.9247412087562, -87.6475634736031)
Uptown	3	Multifamily	Hazel Winthrop Apt	4426 N. Magnolia Av	60640	773-334-5003	Preservation Housir	6	1167071.996	1929651.057	41.96252489	-87.66112652	(41.9625248921977 1, -87.6611265249824 8)
Near North Side	8	ARO	The Leo	741 N Wells	60654	872-873-0741	Cagan Management	4	1174637.062	1905465.741	41.89599326	-87.63403819	(41.8959932601386, -87.6340381880058)
Rogers Park	1	Multifamily	Clark Estes Apts.	1763 W. Estes Ave.	60626	773-293-7443	Ross Financial Serv	54	1163231.887	1947395.327	42.01129755	-87.6747434	(42.0112975535855016, -87.6747434039399 3)
Austin	25	Senior HUD 202	Elois McCoy Village	4650 W. Van Buren S	60644	773-626-5320	Prairie Managemen	60	1145250.308	1897655.195	41.87516675	-87.74216784	(41.8751667549585, -87.7421678377562)
Douglas	35	Mutifamily	Park Boulevard IIB	15 W. 37th St.	60609	773-548-8792	Urban Property Advi	12	1176697.68	1880416.049	41.82720892	-87.62722672	(41.8272089226053, -87.6272267219 2)
Washington Park	40	Multifamily	St. Edmund's Oasis	300-10 E. 61st St.	60637	773-493-2411	St. Edmund's Redev	12	1179107.395	1864667.296	41.78393828	-87.61886624	(41.7839382763516, -87.6188662442677)
West Town	24	ARO	1611 West Division	1611 W. Division St.	60622	773-661-5500	M. Fishman & Co.	10	1165376.188	1908029.505	41.9032305	-87.66797825	(41.903230501389, -87.6679782480489)
Loop	32	Multifamily	Randolph Tower Cit	188 W. Randolph St.	60601	312-291-8679	Village Green Mana	16	1174747.572	1901307.252	41.88457966	-87.63375683	(41.8845796629736, -87.6337568335585)
Hyde Park	41	ARO	5432-44 S. Woodlaw	5432 S. Woodlawn A	60615	312-480-0933	Bickerdike Apts.	10	1185102.561	1869464.413	41.79696316	-87.59673531	(41.7969631559439, -87.5967353132738)
West Town	24	Multifamily	North and Talman F	2654 W. North Ave.	60647	773-486-7410	Hispanic Housing D	30	1158184.401	1910570.961	41.91035449	-87.69432564	(41.9103544922391, -87.6943256396865)
Washington Heights	73	Supportive Housing	Brainerd Park Apts.	8920 S. Loomis St.	60620	312-535-3157	Full Circle Managen	4	1168524.176	1845466	41.73148212	-87.65822063	(41.7314821221761, -87.6582206279217)
North Lawndale	29	Multifamily	Park Douglas	1310-14 S. Washten	60608	773-893-4800	Interstate Realty Ma	10	1158535.345	1893803.561	41.86433604	-87.69349569	(41.8643360428425, -87.6934956949133)
Lower West Side	31	Multifamily	Resurrection Homes	2124 W. 19th St.	60608	312-666-1323	The Resurrection Pr	5	1162389.313	1890761.089	41.85590751	-87.67943292	(41.8559075140985, -87.6794329233162)
North Park	13	Senior	North Park Village A	5801 N. Pulaski Roa	60646	773-478-6890	Elderly Housing Dev	137	1148723.501	1938044.237	41.98593151	-87.72836921	(41.9859315141827, -87.7283692100341)
Near North Side	8	ARO	920northwells	920 N. Wells St.	60610	312-319-9200	Willow Bridge	32	1174510.063	1906800.417	41.89965852	-87.63446469	(41.8996585214079, -87.6344646909791)
Near West Side	28	Multifamily	Jackson Square We	2425 W. Adams St.	60612	312-492-6645	East Lake Managem	115	1160165.746	1898949.65	41.8784239	-87.68736835	(41.8784239004305, -87.6873683542788)
New City	61	Senior	New City Supportive	4707 S. Marshfield A	60609	773-376-1223	BMA Management L	101	1166174.275	1873464.518	41.80836402	-87.66603343	(41.8083640191309, -87.6660334349939)
Brighton Park	58	Multifamily	El ZÃ³calo	3246 W. 47th St.	60632	312-870-4747	H&J Real Estate Mar	30	1155315.538	1873325.098	41.80820589	-87.70586474	(41.8082058904121, -87.7058647387343)
Near South Side	33	Multifamily	Hilliard Homes Pha	2031 S. Clark St.	60616	312-326-1455	Holsten Managemer	176	1175862.866	1890322.361	41.8544114	-87.62999188	(41.8544114000898, -87.6299918763962)
North Lawndale	29	Multifamily	Park Douglas	1345 S. Fairfield Ave	60608	773-893-4800	Interstate Realty Ma	17	1158291.047	1893459.955	41.86339815	-87.69440189	(41.8633981467105, -87.6944018944973)

Within the dataset, there are 14 columns and 593 rows detailing affordable rental housing developments in Chicago. Each column contains specific information such as community area names and numbers, property types, addresses, and phone numbers. Furthermore, details include regarding management companies, unit counts, and geographic coordinates (X and Y, latitude, and longitude, Location). Notably, the zip code column may have integer formats. This dataset enables comprehensive analysis of Chicago's housing landscape, allowing examination of spatial distribution, demographics in the city.

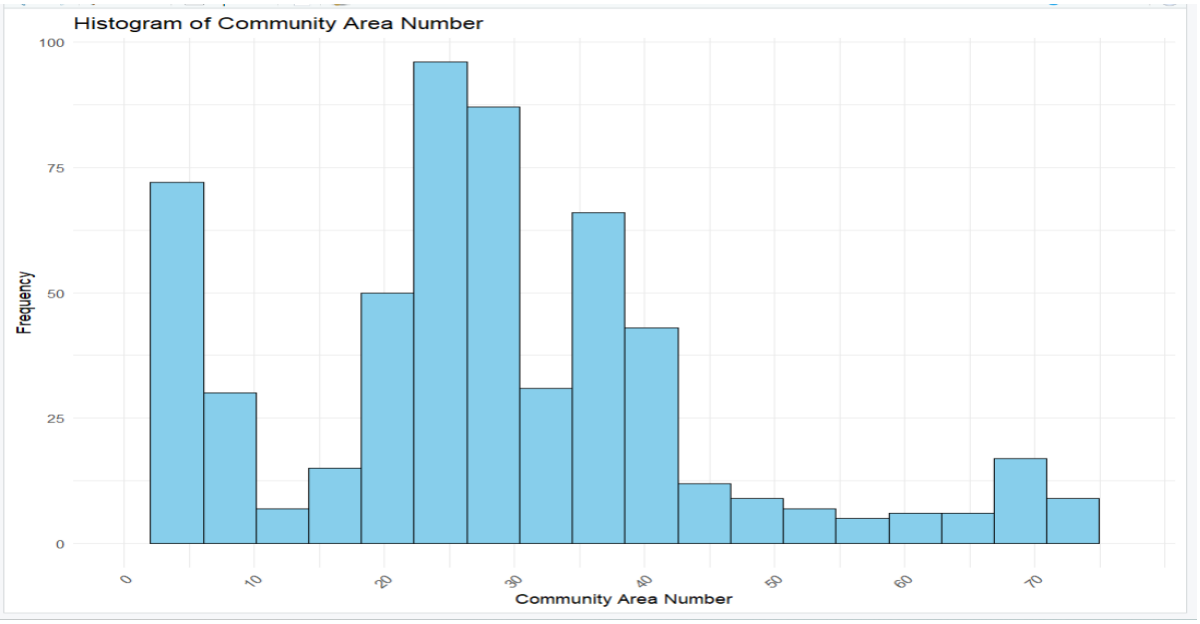
RESULTS:

BAR GRAPH



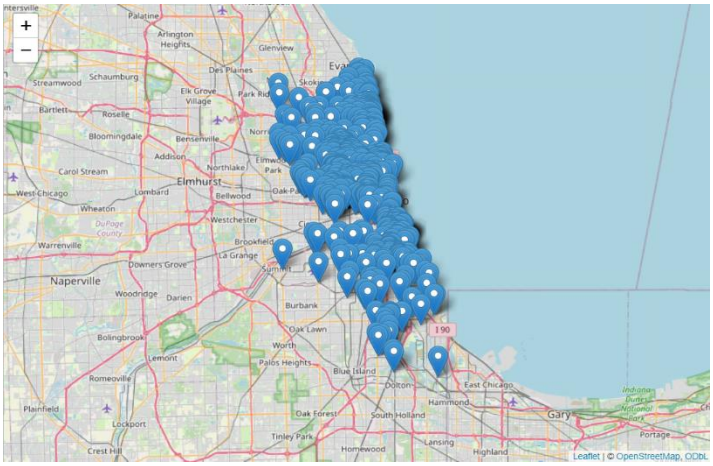
The bar chart titled "Bar chart of Property Type" delineates the distribution of supportive housing units across various property types. The analysis reveals that a significant proportion of supportive housing units are classified under the category of Multifamily (44%), ARO (25%), followed by Senior(18%) and Supportive Housing (25%). Conversely, minimal percentages are attributed to specific demographic groups such as Supportive Veterans, Supportive/Teenage Moms, Supportive/Males 18-24yrs, and Senior LGBTQ individuals, implying a potential scarcity of supportive housing options tailored to these populations. The prevalence of ARO properties underscores a concerted effort to provide affordable housing, while Senior Supportive Housing underscores support for elderly individuals. The percentage of the individual property type is displayed on the right side of the bars.

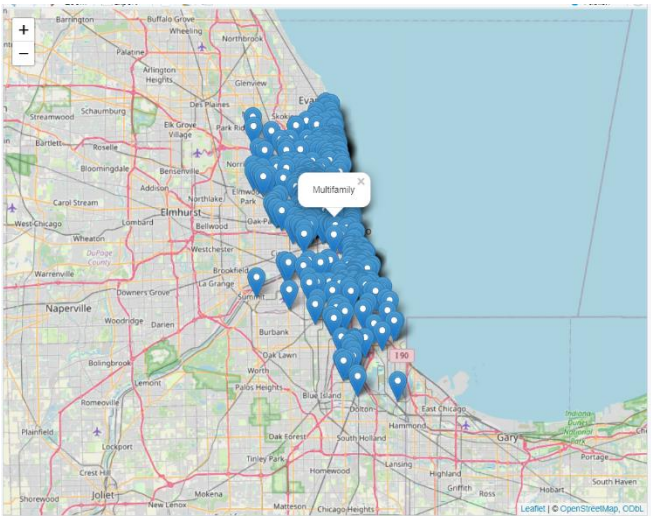
HISTOGRAM:



The histogram displays how community area numbers are distributed, indicating their occurrence across different areas. It shows the x-axis ranging from 0 to the highest community area number, with labels spaced at intervals of 10 for clarity. This visualization offers insights into the prevalence and distribution patterns of housing developments across various community zones, aiding in the analysis of geographic concentration and dispersion within the dataset.

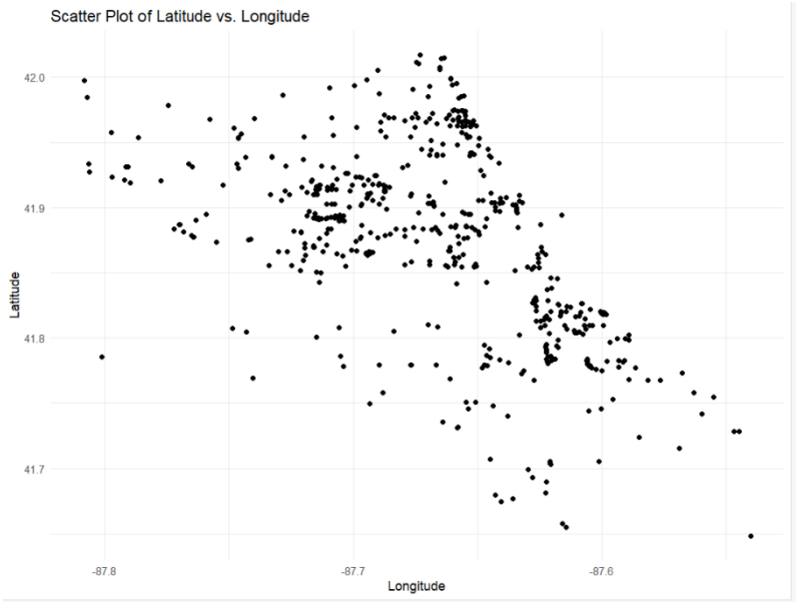
GEOSPATIAL :





This interactive visualization that uses leaflet library enables exploration of the geographic arrangement of affordable rental properties throughout the Chicago city, offering insights into their spatial patterns within the city's neighborhoods. The interactive Leaflet map offers an immersive platform for users to explore how affordable housing developments are distributed across Chicago's neighborhoods. Through features like panning and zooming, users can focus on specific regions or areas of interest within the city, enabling a detailed examination of the geographic patterns of affordable housing availability. This functionality reveals insights into the disparities and concentrations of affordable housing across different neighborhoods, providing valuable information for understanding local housing dynamics. Additionally, the map allows users to click on individual markers to access more details, such as the property type of each housing development (An example is given in which it has 'Multifamily' Property Type). This added functionality enhances the map's usefulness by providing deeper insights into the characteristics of affordable housing options in various parts of the city. Users can gain a better understanding of the local housing landscape and identify trends or patterns that may inform decision-making processes.

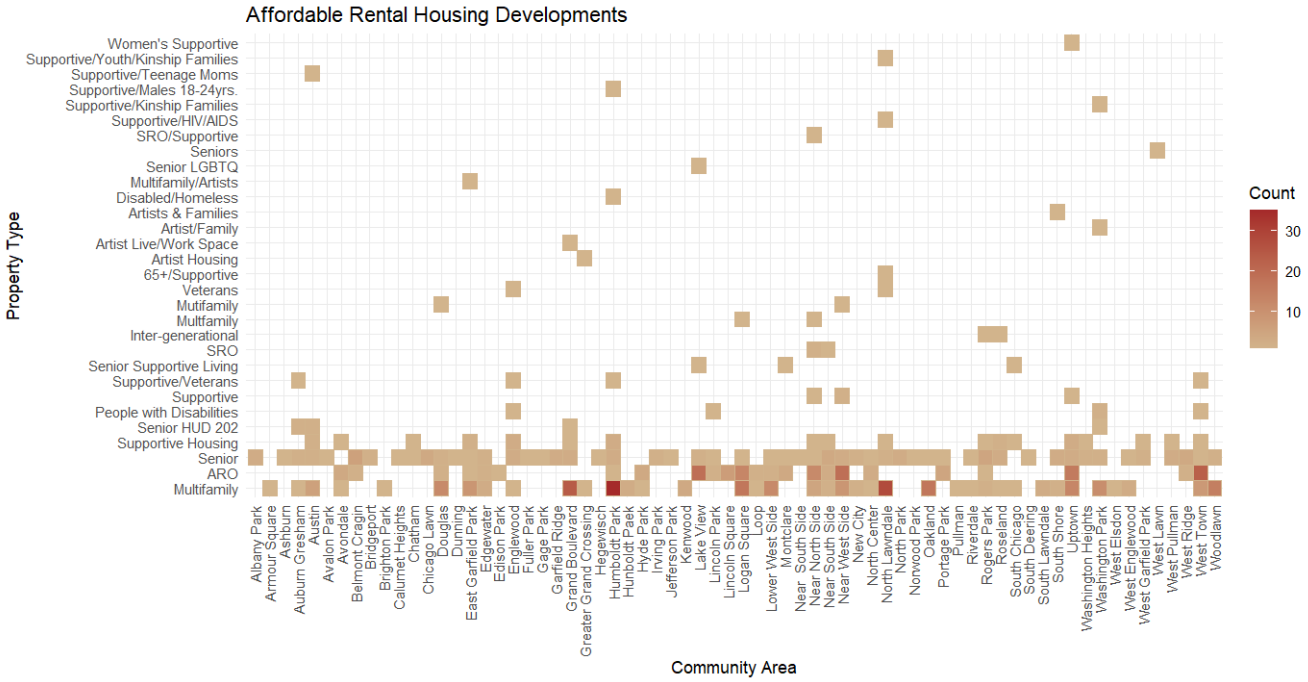
SCATTER PLOT:



A scatter plot visually depicts the correlation between two continuous variables by plotting data points on a Cartesian plane. Specifically, it illustrates the relationship between latitude and longitude coordinates in a dataset. This visualization is crucial for analysing spatial patterns and distributions, as it presents geographical data points in a two-dimensional format. Each point on the plot represents a unique location identified by its latitude and longitude coordinates, providing insights into the spatial arrangement and grouping of observations. The plot's labelled axes and title

enhance clarity and context, facilitating the interpretation of geographical relationships within the dataset.

HEATMAP:



The heatmap created visually illustrates the number of affordable rental housing developments categorized by property type and community area in Chicago. Each cell in the heatmap corresponds to a unique combination of property type and community area, with color intensity indicating the count of housing developments. Community areas are represented on the x-axis, while property types are depicted on the y-axis, facilitating easy comparison across different areas. Darker colors represent higher counts, allowing for the identification of predominant property types in specific community areas same less darker color represent lower counts. Heatmaps are valuable tools for detecting patterns and trends within datasets.

CONCLUSION

In conclusion, our analysis of affordable rental housing in Chicago, supported by diverse visualizations like bar graphs, histograms, scatter plots, heatmaps, and geospatial maps, has revealed critical insights. These insights inform housing policy and urban planning, addressing key research questions about property distributions, spatial trends, and correlations between property types and unit counts.

REFERENCES

[1] “City of Chicago - Affordable rental housing developments,” Apr. 19, 2024. https://catalog.data.gov/dataset/affordable-rental-housing-developments

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