

Educational Access and Housing Dynamics in Chicago's Neighborhoods

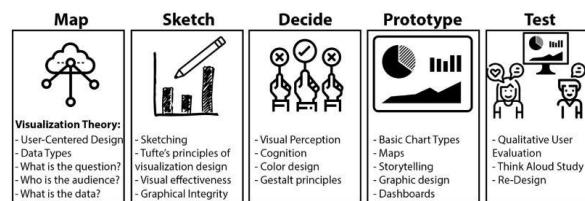
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The intersection of affordable housing and education shapes the lives of countless people, influencing educational outcomes, access to opportunities, and the establishment of community foundations. Looking specifically at Chicago, it is a city with a rich history, diverse demographics, and an ongoing struggle with socioeconomic disparities. It presents a unique look at where housing policies and educational quality have long been hot-button issues. The question we explored was: **What is the relationship between the placement of affordable housing and public schools?**

The datasets we worked with are from the **Chicago Data Portal**:

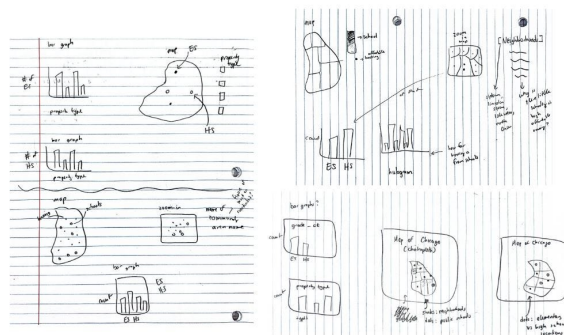
- [Chicago Public Schools—School Locations SY2021](#)
- [Affordable Housing Units by Community Area](#)
- [Boundaries—Neighborhoods](#)

For our project, we followed the design process seen below:



Ideation + Sketching + Decide

As we analyzed the data, looking through the various tables, we first sketched out ideas for potential ways to visualize the data.

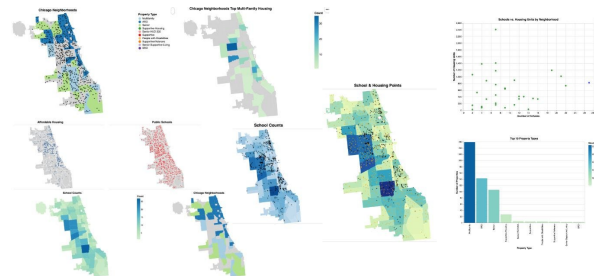


Sketches of original designs including Choropleth, bar charts, and point based graphs

We wanted to have multiple map visualizations to present the relationships of **affordable housing** and **public schools**, but we were debating whether to present them on separate maps or combine them into one. We also wanted to have a visualization that provides a count. Much of the decisions came when we prototyped our sketches into code.

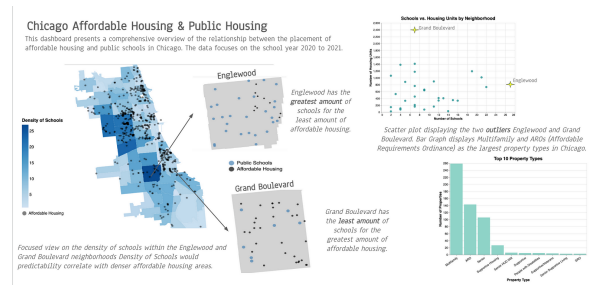
Prototypes

We took our sketches and created them in Google Colab. Below are some instances of the visualizations we created.



Choropleth map's of housing, school counts, and property types. Original Scatter and bar graph.

In the prototyping stage, we experimented with prototypes that incorporated a sequential color scale on a 2D map, aiming for a visual equilibrium—a midpoint between abrupt and smooth as well as between continuous and discrete. This reflective process led us to favor a **sequential scale**, particularly apt for the nuanced variations in our choropleth map. We identified that we wanted an open page and schematic layout in order to interconnect individual visualizations within a single-page framework.



Original dashboard design before changes

Additionally, we realized the importance of ‘detail on demand’—providing rich context and a layered narrative upon user engagement. Our prototypes also brought to our attention the significance of filtering mechanisms to direct attention to specific Chicago locations.

Changes we implemented for the dashboard and visualizations:

- Adjusted axis sizing in scatter plots and bar graphs
- Lowered tick amounts to increase font size
- Changed point colors from black to red for better visibility
- Changed color schemes from diverging to singular or sequential

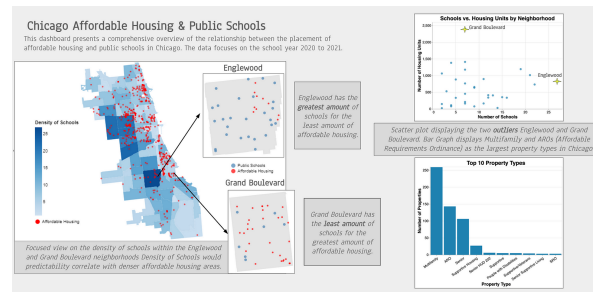
Other questions we began to consider were: *When creating the final dashboard, we also had to keep in mind cohesive chart ensembles. What color scheme do we want to go with and how can we intentionally use color to draw attention to the users, especially because the dashboard is static.*

Feedback (Testing)

We asked 20 people to review our prototypes. As they reviewed, we asked them to walk us through what they noticed and the insights they gained from our visualizations. The following is the feedback we received:

- “The slide itself looks really bugged because the dimensions were changed from the original slide dimensions. I liked the color scale from the left most graph. I also **liked the color choice** for both the Englewood graph and Grand Boulevard, its very clear where everything is and its not overcrowded. Overall if I could change anything it would be the staticness of the choropleth map, but that isn’t allowed at this time”
- “The arrows indicating the outliers in your choropleth is helpful as well as the different points used for them in the scatter plot. **The dashboard is clean and doesn’t seem too cluttered.** One thing that could help is having something show which dot is which on your map between schools and affordable housing.”
- “I really like the **annotations and the stars for the data points** that standout, that really caught my eye so I would see what I was supposed to take away from the viz quickly. I also liked how you zoomed in on the relevant districts.”
- “I like how all of the colors are seem to align well. Additionally the annotations and text is useful for providing addition analysis. The text on the bar chart and scatter plot seem a little small and could be bigger in my opinion”
- “Clean and concise dashboard, I like the inclusion of outliers”
- “I liked the diversity of graph types and thought the aesthetic of the dashboard with the color scheme. It seems that the Englewood and Grand Boulevard subgraphs may reflect contradictory evidence to what is stated below the main choropleth. Maybe **specify the kind of correlation** in the main statement (higher school density correlates to lower numbers of affordable housing)”
- “Like: I like the color scheme of the dashboard, everything is very calm and easy to read. Also great different graphs Improve: Maybe **simplify the extra charts** so that there is not as much empty data that takes up space.”
- “I like the added text callouts/explanations. I think it really helps to tell the story because you are looking at a more granular issue rather than just looking at housing and schools. The only thing I can think to change is the number of fonts/font sizes.”
- “I like how you **pinpoint out certain areas** and expanded it out so the viewer can see more in depth at certain locations. I also like the captions explaining the different charts. One thing I think could be good is to just make the color scheme the same throughout all of the graphs”

Final Dashboard



Final Dashboard design of Chicago's Affordable Housing and Public Schools

- The **Scatterplot** shows the relationship between schools and affordable housing units (**Englewood and Grand Boulevard** were the two outliers we zoomed in on)
- The **Choropleth Chart** includes the neighborhoods of Chicago ranked on a sequential scale. The points on the scale represent buildings with affordable housing
- The two **zoomed-in districts** from the choropleth show the outliers, Englewood and Grand Boulevard with points: Affordable housing and Public School spaces
- The **Bar Chart** in the bottom right corner shows the amount of the top 10 different property types in the affordable housing dataset (2 highest: Senior Living and ARO)

Reflection

As a team, we were satisfied with the way the dashboard ended up with a user-centric design that makes complex data accessible and engaging. We drew inspiration from the example dashboard presented to us in class, including zooming into certain geographic sectors of Chicago to see why certain clusters were on the choropleth. Our improvements helped improve visibility and create a more professional dashboard.

Conclusion

In drawing our conclusions we found inconsistencies in the distribution of public schools vs affordable housing within Chicago's neighborhoods. Englewood emerged with a high concentration of public schooling but a scarcity of affordable housing.

Grand Boulevard contrasted with a large amount of housing but fewer schools. This could be due to broader systemic issues within the city's urban planning due to resource allocation and socioeconomic divides. Education access and housing affordability influence city residents and could affect daily commutes and quality of life.

Further insight should reflect strategies that can address these imbalances and create a better urban ecosystem.

- A closer look into other outlier districts to find trends and patterns

- Segmenting schools by level—elementary, middle, or high—as well as governance structure, such as public, private, and charter
- Exploration into the racial and socioeconomic composition of these districts

With deeper analysis, we could reveal how the variety of schooling options available influences educational outcomes. Uncovering demographic patterns of segregation or inclusivity and potential barriers to access would help target interventions. Such insights would contribute to the overall social and economic health of the community.