Course Project User Guide

# Introduction

Our research delves into the dynamics of real estate valuation, assessing the progression of property values from 2015 to 2022. By methodically dissecting data from various property categories and neighborhoods, we aim to uncover underlying trends and the impact of policy incentives such as homestead exemptions. Through a comprehensive study incorporating mean and median valuation metrics, residential and non-homestead property analysis, and segmentation by property type, this project seeks to furnish critical insights into the property market's evolution. Our findings are poised to serve as a strategic tool for stakeholders, paving the way for data-driven decision-making in real estate investments.

# Methodology

In our Property Value Growth Analysis project, we approached the challenge by meticulously preparing and examining our datasets to ensure robust and reliable findings. The initial phase involved leveraging Python's Pandas library to clean and preprocess the data, which included parsing through 2015 and 2022 property records to establish a foundational understanding of the growth trends.

During the data scrubbing process, we prioritized the inclusion of fields that would offer the most significant insights into property value changes over time. This entailed a thorough review and verification of property types, values, and other pertinent details that could influence growth calculations. We made a strategic decision to exclude condominium data from questions 2, 4, and 5 due to its disproportionate influence on the analysis, which skewed the results away from an accurate market representation.

With a refined dataset, we then calculated growth rates, emphasizing mean and median values to capture the essence of market trends. Our methodology utilized statistical packages within Python to handle complex computations and ensure precision in our growth calculations.

For spatial analysis, we employed a neighborhood map that added geographical context to our data. This layer of analysis allowed us to visualize and understand how property values varied across different neighborhoods, providing valuable insights into localized market dynamics.

The culmination of our methodology involved comparative analysis using Microsoft Power BI. This powerful data visualization tool enabled us to construct interactive and insightful charts and graphs, illustrating the disparities and patterns in property value growth across different sectors and neighborhoods.

The anticipated outcomes of our methodology are multifold. We aim to deliver informed investment strategies, aid strategic development planning, support policymakers in assessing tax incentive impacts, offer real estate professionals a comprehensive market trend analysis, and enhance property valuation models. Through our systematic approach to data preparation and analysis, we are confident in providing stakeholders with actionable intelligence to make well-informed decisions in the real estate market.

# Results

**Research Questions:**

Group 3: Neighborhood Property Value Analysis – Analyze the growth rates of each neighborhood from 2015 to 2022 using the mean and median values

**a. For all properties?**

The comprehensive analysis indicates a varied landscape of property value growth across neighborhoods. Historic Roser Park outperformed all with its staggering growth rates, while Thirty-First St saw depreciation, signaling a potential need for revitalization efforts or a pivot in market strategy.

A graph of growth rate

Description automatically generated with medium confidence

**b. For all strictly residential properties?**

The strictly residential sector showed a remarkable surge, particularly in Vacant Condo (development land), indicating a high investor interest in these properties. This trend may guide future development and zoning decisions.

A graph showing a blue line

Description automatically generated

**c. For all single-family residential properties?**

The consistent growth in single-family residences, especially those with additional housing units, suggests a steady demand for such properties, reflecting their continued desirability for families and investors alike.

A graph of blue and white bars

Description automatically generated with medium confidence

**d. For single-family residential properties that are NOT homestead?**

Non-homestead properties, particularly larger apartment complexes, demonstrated significant growth, pointing to a robust investment and rental market that could attract real estate developers and investors.

A graph of a number of blue and red bars

Description automatically generated

**e. For single-family residential properties and missing middle properties?**

The trend in this category emphasized the market's inclination toward larger apartment units, presenting opportunities for urban development focused on density and scalability.

A graph showing a blue and purple line

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**f. Provide a narrative summary of the impact of homesteads on the property value growth rates.**

Homestead exemptions appear to moderate growth rates, offering a degree of market stability for homeowners. This finding is crucial for policymakers to balance investment-driven growth with housing affordability.  
A graph of a number of blue and white bars

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# Conclusions

* **For all properties**: Stakeholders should consider the divergence in growth rates across neighborhoods, which presents both challenges and opportunities for targeted investment and development.
* **For strictly residential properties**: The explosive growth in development land suggests that investor focus may shift more toward these areas. Monitoring zoning laws and development policies will be essential.
* **For single-family residential properties**: The stability in this market segment makes it a reliable area for long-term investment, with a focus on community development to maintain desirability.
* **For non-homestead single-family residential properties**: The significant appreciation underscores the investment quality of these properties, which could influence rental market dynamics and housing supply strategies.
* **For single-family residential and missing middle properties**: The growth disparity between property sizes indicates a market trend towards larger units, which could inform future urban planning and housing policies.
* **Impact of homestead exemptions**: The tempering effect of homestead exemptions on growth rates may serve as a protective mechanism for homeowners, but it may also dampen investment incentives. Further analysis could explore the long-term implications on neighborhood demographics and property tax revenues.

Each of these conclusions offers a snapshot of the current market dynamics and provides a foundation for strategic decision-making. Opportunities for further analysis include a deeper dive into the causal factors behind neighborhood growth variations and a longitudinal study on the long-term effects of policy changes on market trends.

# Link to Visualizations

[PowerBI Link](https://app.powerbi.com/links/1Dau6gIQtk?ctid=741bf7de-e2e5-46df-8d67-82607df9deaa&pbi_source=linkShare&bookmarkGuid=92ed828e-c75a-4904-b359-76e94e94042f)

# Appendix

Appendix A: Detailed Visualizations and Corridor Analysis

**Visualization A1: Neighborhood Growth Patterns (2015-2022)**

This chart displays the property value growth patterns across all neighborhoods. The visualization illustrates the highest and lowest performing areas, with Historic Roser Park's significant increase contrasted against the decline in Thirty-First St.

**Visualization A2: Residential Market Trends**

A bar graph showcasing the growth rates in the strictly residential property market. It highlights the exceptional rise in Vacant Condo development land, providing a visual representation of the market's trend towards these investments.

**Visualization A3: Single-Family Residential Growth**

A line graph that tracks the growth trajectory of single-family residential properties. The graph delineates the consistent demand for these homes, particularly those with additional housing units.

**Visualization A4: Investment-Driven Property Growth**

This visualization focuses on non-homestead single-family properties, showing a heatmap of growth rates that underscore the investment appeal of these property types, especially larger apartment complexes.

**Visualization A5: Comparative Analysis of Property Sizes**

A scatter plot comparing the mean and median growth rates of single-family residential properties against missing middle properties, such as duplexes and fourplexes, to reveal the market's shift towards larger units.

**Visualization A6: Homestead Exemption Impact Analysis**

A series of pie charts and trend lines that analyze the growth rates of properties with and without homestead exemptions. This visual helps decipher the protective role of homestead exemptions in market stability.

Each visualization is supported by the underlying data and statistical analysis, which are available upon request for stakeholders who wish to perform their own review or require additional information for decision-making processes. These visuals serve as a comprehensive accompaniment to the project summary, providing deeper insights into the property value growth trends identified in our research.