# Course Project User Guide - GROUP 6

## Introduction

This research aims to give an in-depth analysis of property values in two areas: one north and one south of 5th Avenue South. We will be able to figure out the changes in these values over time by looking at data from 2015 and 2022. In particular, non-residential and mixed-use property will be separated from other types of properties in the analysis. We hope that our research will give stakeholders a thorough understanding of the dynamics of property values near 5th Avenue South, helping them to make informed decisions about revenue taxes, urban planning, and investment.

## Methodology

**Data Description:** Our datasets encompass property information for 2015 and 2022, detailing neighborhood boundaries with coordinates and property categorizations in St. Petersburg. The property categorization dataset classifies properties by use, such as residential or non-residential and mixed-use properties.

**Data Cleaning:** Data cleaning serves as the foundation for reliable analysis, and when examining growth over time, it is particularly crucial. For the datasets of 2015 and 2022, we first identified and addressed missing values, ensuring consistency across the two time points. After rectifying discrepancies and standardizing property use definitions, we merged the datasets, aligning them on common identifiers like property ID.

**Data Segmentation:** In our analysis for Group 6, we segmented the dataset based on the geographical criterion relative to 5th Avenue South, classifying properties as either on/north of 5th Avenue or south of it. This division is crucial for our comparative study of property values across these distinct zones. We then further refined our data by categorizing properties into two groups: all properties, non-residential and mixed-use properties.

**Research Questions Alignment:** To address our research questions effectively, we precisely segmented our property data into distinct categories, including all properties, non-residential and mixed-use properties. This categorization allowed us to conduct targeted analyses on how property values are influenced by their location relative to 5th Avenue South.

**Data Analysis:** We have used Tableau as a primary tool for creating interactive visualizations and exploring the property value trends.The interactive visuals offered a detailed perspective of property patterns across time, built around the cleaned and standardized 2015 & 2022 datasets.

**Developing Visualizations:**

- **Property Value Trends:** Bar charts are used to depict the average and median taxable values of properties, distinguishing between different property uses and location categories. Each bar

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represents a specific property use and is color-coded to denote the location (north or south of 5th Avenue South), facilitating quick visual comparisons.

- **Growth Rate Calculations:** A separate set of visualizations is created to showcase growth rates in property values from 2015 to 2022. These are also displayed using bar charts, where the height of the bar indicates the growth percentage, and the colors differentiate the location category.

**Validation and Quality Assurance:** To make sure our results were reliable, we set up a thorough checking process where all team members reviewed the data repeatedly. This step-by-step check helped us find and fix any mistakes, ensuring our findings were accurate and trustworthy. This careful approach aimed to build confidence in our analysis and conclusions.

## Results

**1. Calculate the mean and median property values in 2015 for properties on/north of 5th Avenue South compared to properties south of 5th Avenue South:**
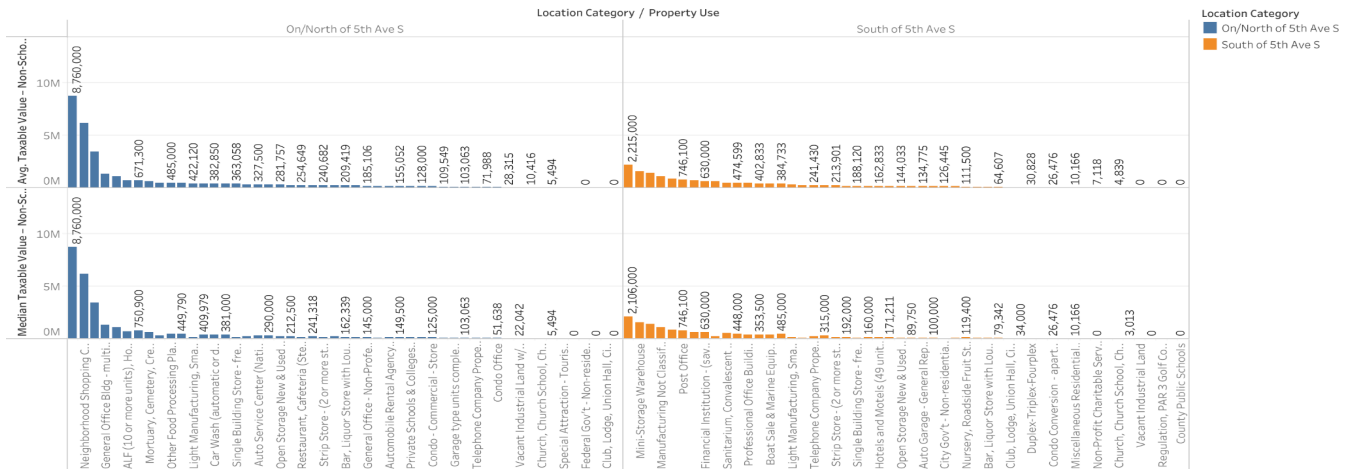


5th Ave. South & North 2015: All Properties Comparison
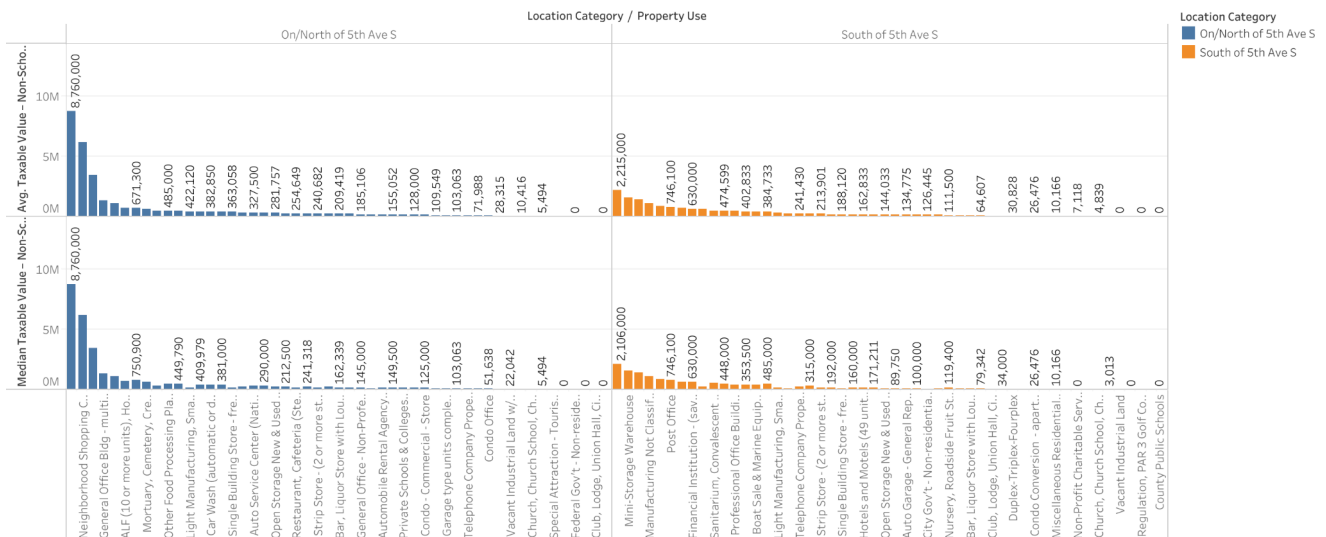
**a. For all properties:**

According to the above bar graphs, which show the mean and median property values for all properties comparing on/north of 5th Avenue South and properties to South of 5th Avenue South for the year 2015, both the mean and median values are higher for the on/north of 5th Avenue South (highest value being 8,726,920 for Super market & Superstore) when compared to the mean and median of the South of the 5th Avenue South (highest being 2,215,000 for Neighborhood Shopping Centers).

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**5th Ave. South & North 2015: Non-Residential & Mixed-Use Comparison**



## b. For non-residential and mixed-use properties:

Similar to all properties, according to this representation, the mean and median for non-residential and mixed-use properties are higher for the properties on/north of 5th Avenue South, where the highest is 8.7 million for "Super market & Superstore" when compared to the properties south of 5th Avenue South where the highest is 2,215,000 for "Neighborhood Shopping Centers."

## 2. Calculate the mean/median property values in 2022 for properties on/north of 5th Avenue South compared to properties south of 5th Avenue South:

**5th Ave. South & North 2022: All Properties Comparison**
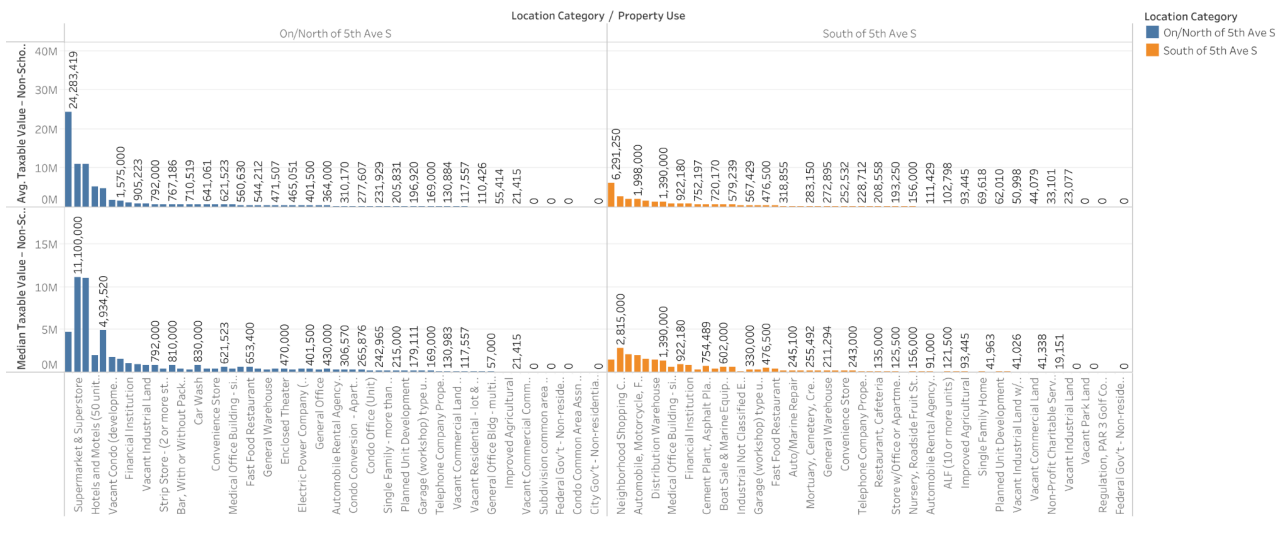


## a. For all properties:

In the year 2022, the graphical representation depicts that the average and median are higher for the properties on/north of the 5th Avenue South compared to the properties on the south of 5th Avenue South.

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The highest value for average and median for properties on/north of 5th Avenue south is 24,283,419 and 11,100,000 respectively for supermarket and superstores whereas on the other hand for properties on the south of 5th Avenue south are 6,291,250 and 2,815,000 for neighborhood shopping centers.

**5th Ave. South & North 2022: Non-Residential & Mixed-Use Comparison**
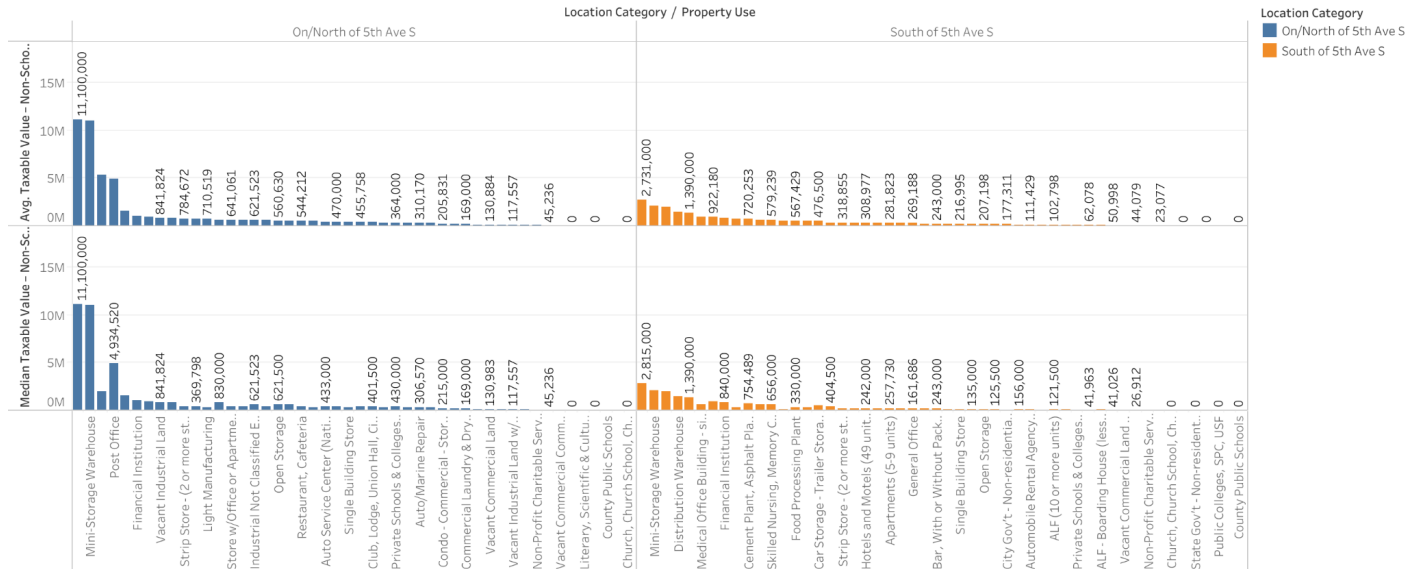


**b. For non-residential and mixed-use properties:**

This above chart represents the comparison of non-residential and mixed-use properties between the properties on/north of 5th Avenue South compared to properties south of 5th Avenue South in the year 2022.

The average and median are higher on/north of 5th Avenue South with the highest value being around 11 million for super market and superstores whereas in properties south of 5th Avenue South, the highest is only 2.73 million, again for neighborhood shopping centers.

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**3. Calculate and show the growth rates (%) in property values for properties north/on 5th Avenue South compared to those properties south of 5th Avenue South between 2015 and 2022 for:**



Growth Rates in Property Values (2015-2022)
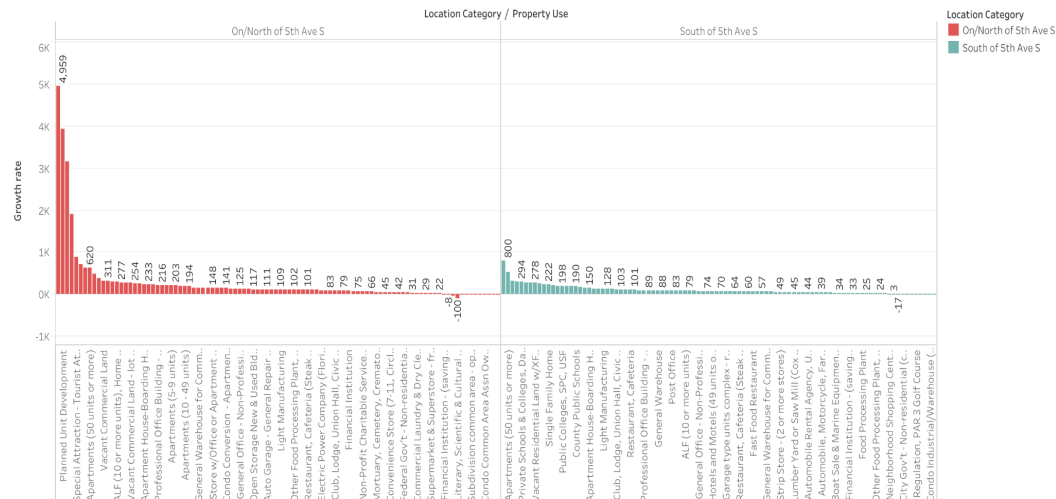
**a. For all properties:**

The above graph shows the growth rates in property values from 2015 to 2022. The "Literary, Scientific & Cultural Facilities" properties show the maximum decrease in value in the period between 2015-2022. Whereas the "General Office Bldg - multi-story/campus" shows maximum growth in the given time frame. This is for the properties on/north of the 5th Avenue South. For the properties south of 5th Avenue South, max growth rate is shown in the properties, "Miscellaneous Residential."



Growth Rates in Non-Residential & Mixed-Use Values (2015-2022)
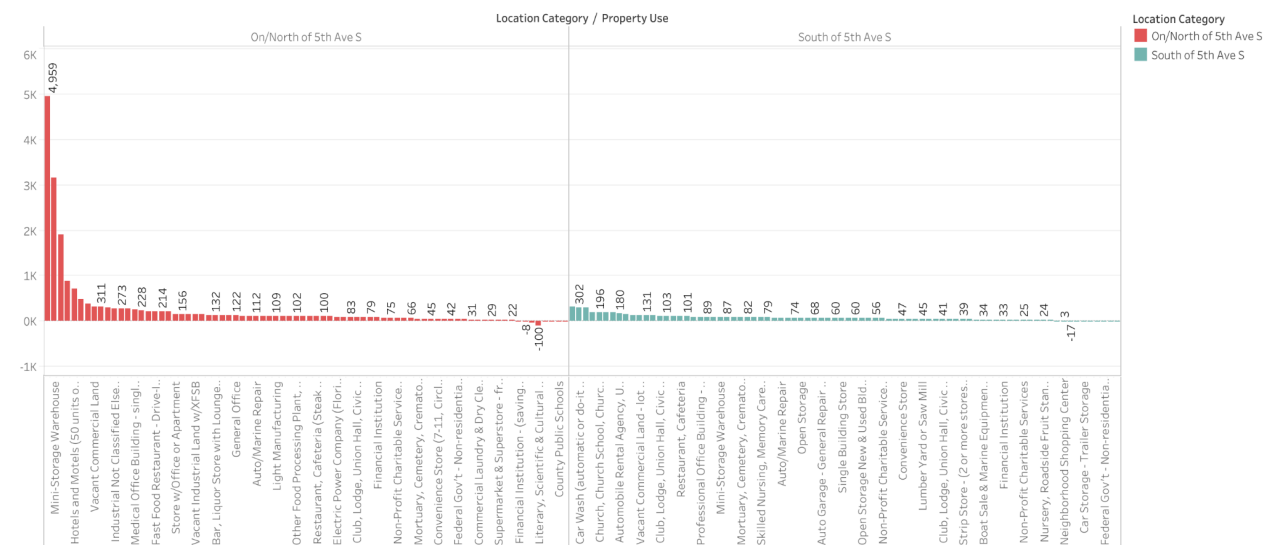
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**b. For non-residential and mixed-use properties:**

The below chart showing the growth rates in non-residential and mixed-use properties between the years 2015 and 2022 say that the "General Office Bldg - multi-story/campus" shows the greatest increase in percentage for the properties on/north of the 5th Avenue South. On the other hand, the "Literary, Scientific & Cultural Facilities" properties show the maximum decrease in percentage.

Whereas for the properties south of 5th Avenue South, there is a maximum decrease in "car storage-trailer storage" and maximum increase in "ALF - Boarding House (less than 10 units)."

## *Conclusions*

**First Research Question: Comparative Property Values in 2015**

The analysis of the first research question reveals that in 2015, properties on/north of 5th Ave South held higher average and median taxable values across most property use categories compared to those south of 5th Ave South. The most valuable properties in both areas were apartments, offices, and hotels, indicating a concentration of commercial and residential activities.

**Second Research Question: Trends in Property Value Growth (2022)**

Property values exhibited significant growth on/north of 5th Ave S, with some property types experiencing over 1000% growth. South of 5th Ave S also showed growth, but at a more moderate rate.

**Third Research Question: Differential Growth Trends by Property Type**

Non-residential and mixed-use properties, particularly on/north of 5th Ave S, have seen the most significant growth rates, far outstripping residential properties. This may indicate a thriving business environment and a possible shift towards mixed-use development trends in the area.

Future analysis should explore the socio-economic reasons behind property value differences and growth trends, considering changes in population, city policies, and market conditions from 2015 to 2022. Studying the impact of zoning laws, infrastructure projects, and investment patterns on the commercial activity north of 5th Ave S compared to the residential areas south of it can offer valuable insights. It's also important to assess the sustainability of growth in non-residential and mixed-use properties for long-term urban planning and community welfare. This deeper investigation can provide decision-makers with a solid foundation for planning and ensure balanced development that benefits everyone.

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**Question 1:**

**https://public.tableau.com/app/profile/ranjith.babu.vennam/viz/EIS_Question1/Question1**

**https://public.tableau.com/app/profile/ranjith.babu.vennam/viz/EIS_Question12/Question12**

**Question2:**

**https://public.tableau.com/app/profile/ranjith.babu.vennam/viz/EIS_Question2/Question2**

**https://public.tableau.com/app/profile/ranjith.babu.vennam/viz/EIS_Question22/Question22**

**Question 3:**

**https://public.tableau.com/app/profile/ranjith.babu.vennam/viz/EIS_Question_3/Question3**

**https://public.tableau.com/app/profile/ranjith.babu.vennam/viz/EIS_Question_32/Question32**

**Interactive map:**

**https://public.tableau.com/app/profile/ranjith.babu.vennam/viz/EIS_Question_33/Sheet3**

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