Problem Statement

Housing prices vary widely based on property size, layout, location, and amenities. This report analyzes a real-world housing dataset to identify the most influential factors affecting house prices and uncover patterns that support data-driven real estate decision-making.

Objectives

- Analyze the distribution of housing properties based on structural features and amenities.
- Examine the relationship between house prices and key physical attributes such as area, bedrooms, bathrooms, stories, and parking.
- Compare average house prices across different furnishing statuses and amenity availability.
- Identify the key factors influencing house prices.
- Generate data-driven insights relevant to buyers, sellers, and real estate professionals.

Business Questions Addressed

1. Which factors have the greatest impact on house prices?
2. How strongly does property area influence pricing?
3. Which amenities significantly increase property value?
4. Does furnishing status justify higher prices?
5. How do bedrooms, bathrooms, and stories affect house prices?
6. Are preferred locations associated with premium pricing?
7. What is the dominant housing configuration in the market?
8. Which property features offer the highest price uplift?

Dataset Description

The analysis is based on a structured housing dataset containing information on property prices, area, furnishing status, location, and amenities. The dataset includes multiple categorical and numerical variables representing real-world housing characteristics.

Methodology Overview

The study follows an exploratory data analysis approach using descriptive statistics and visual analysis to examine relationships between housing features and prices.
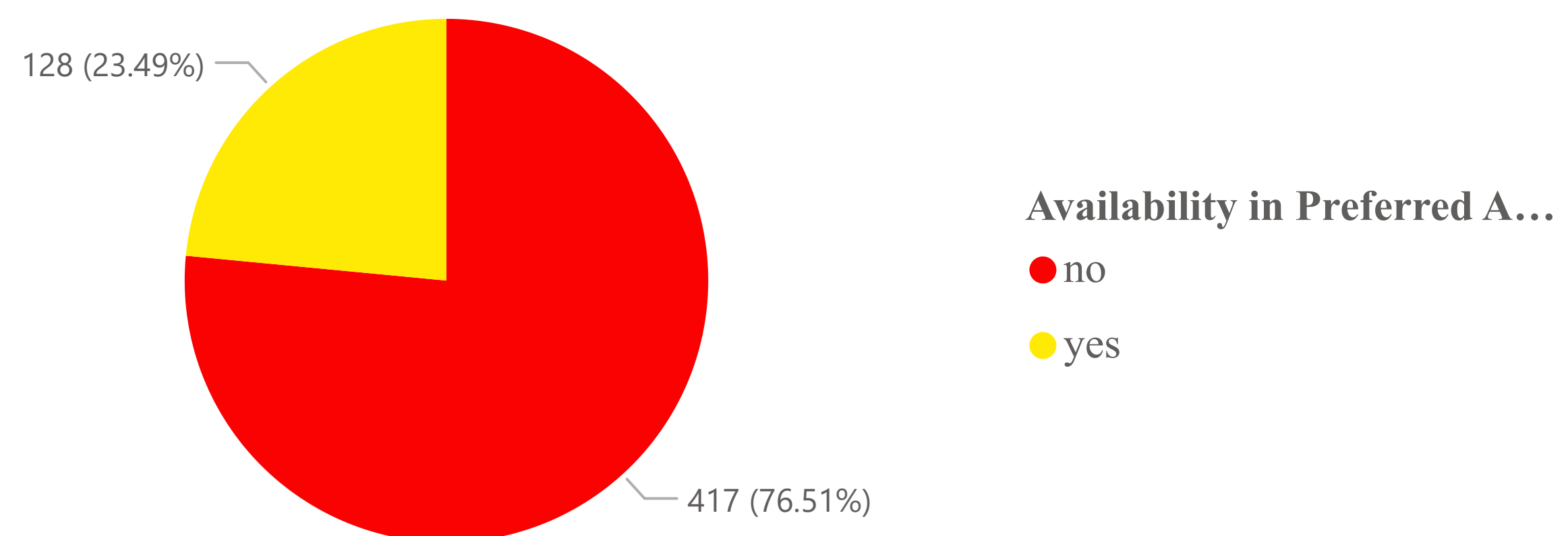
Relationship Between Area and Price
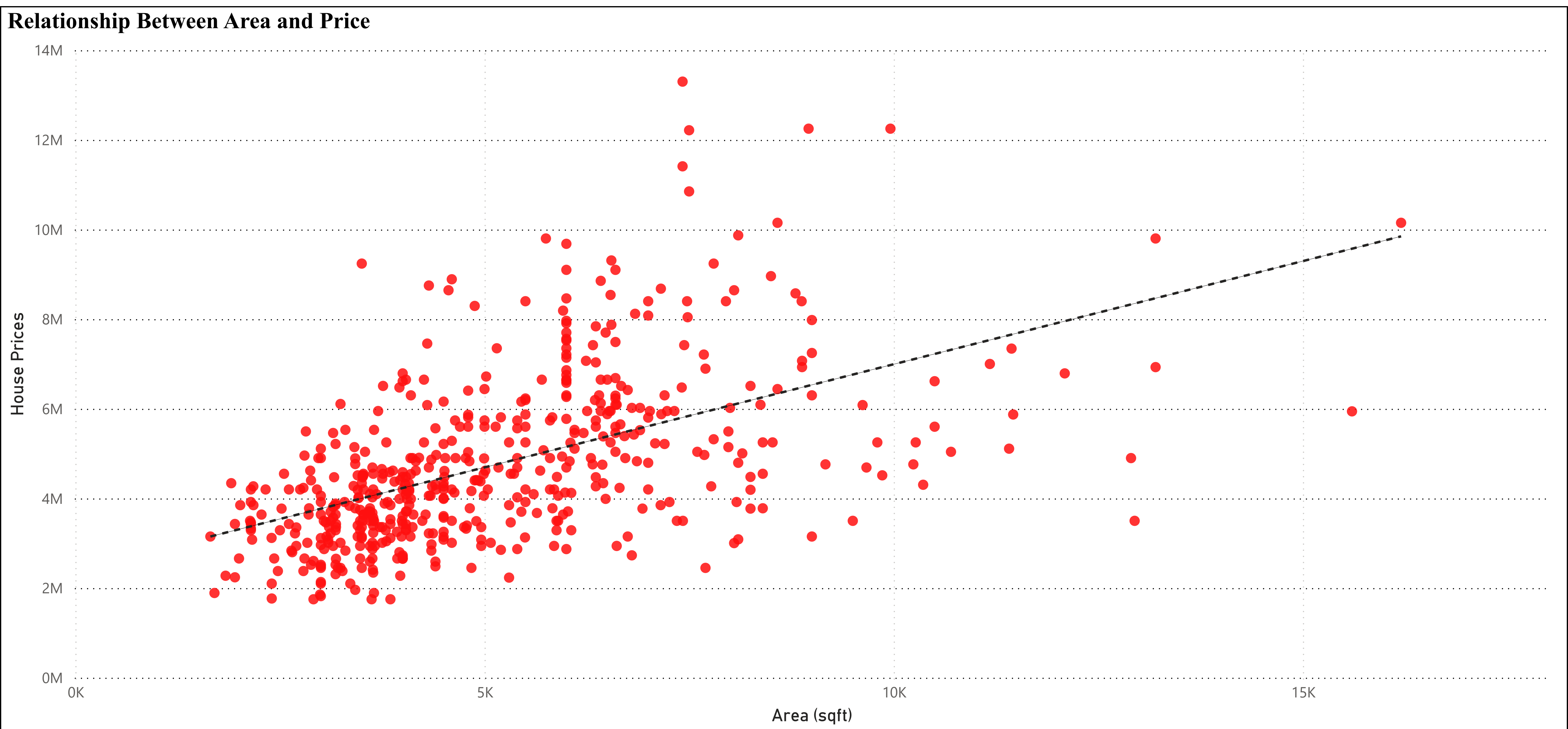
Interpretation: The upward trendline indicates a strong positive relationship between property area and house price, confirming that larger houses generally command higher prices. However, the wide dispersion of prices—especially at higher area values—suggests that area alone does not determine price. This variability indicates that other factors such as location, number of bathrooms, and availability of amenities play a significant role in influencing house prices alongside area.
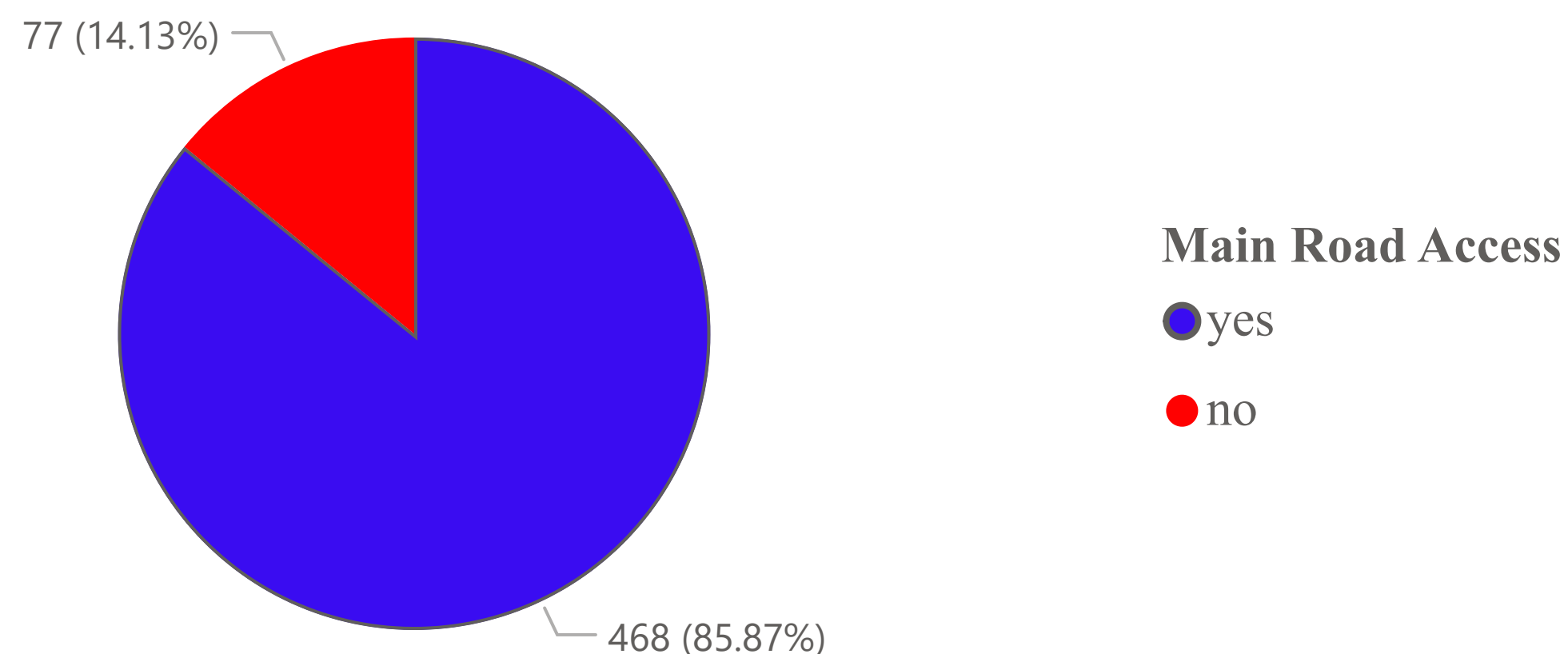
Market Distribution by Furnishing Status

140 (25.69%)

227 (41.65%)

178 (32.66%)

Furnishing Status
- semi-furnished
- unfurnished
- furnished
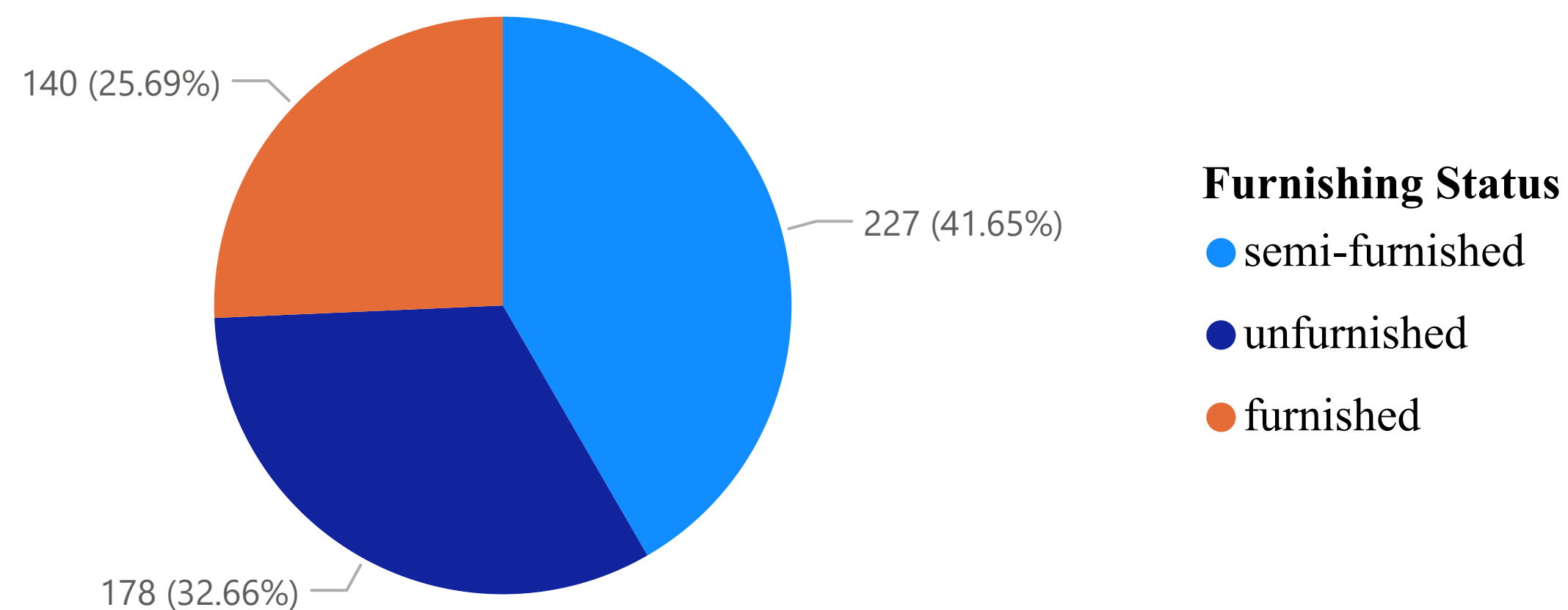
Distribution of Houses by Preferred Area Availability

128 (23.49%)

417 (76.51%)

Availability in Preferred A…
- no
- yes

House Market Distribution by Main Road Access

77 (14.13%)

468 (85.87%)

Main Road Access
- yes
- no

## Availability of Guestrooms Across Housing Market

97 (17.8%)

448 (82.2%)

Guestroom Availability
- no
- yes
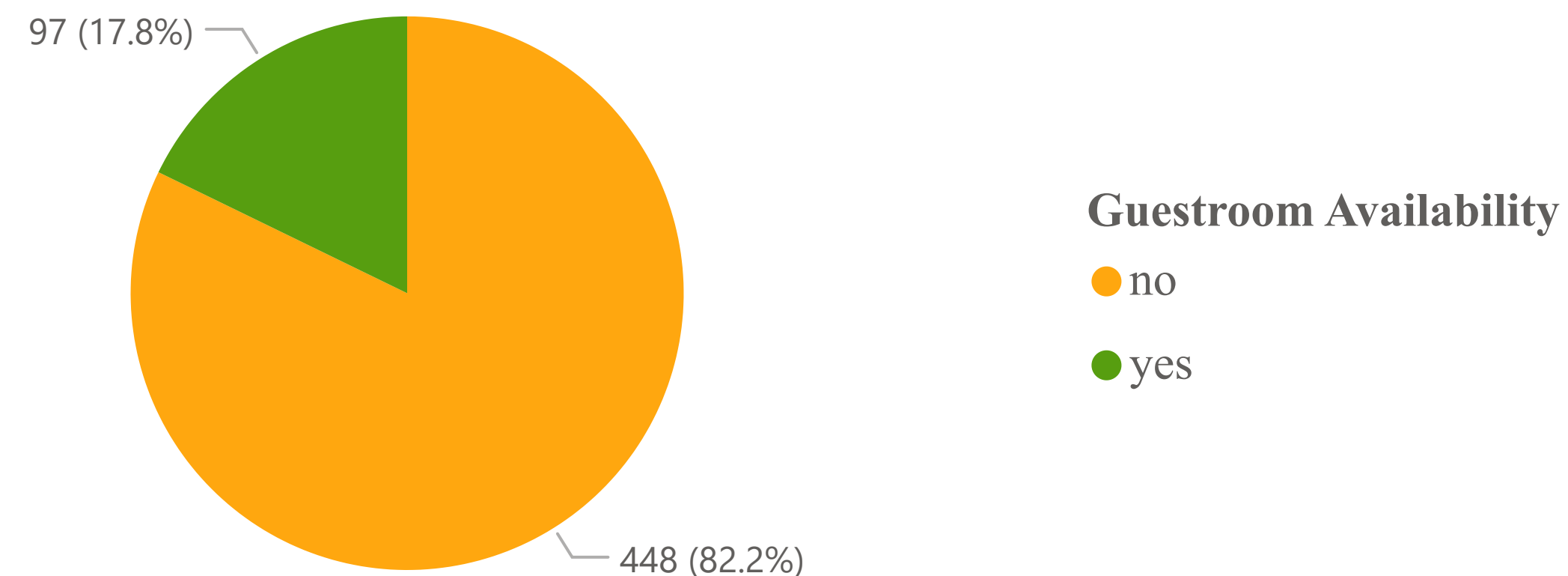
Interpretation: The housing market is dominated by semi-furnished properties and houses with main road access, indicating these features are common rather than premium. In contrast, properties located in preferred areas and houses with guestroom availability form a smaller proportion of the market, suggesting limited supply of premium features. This imbalance indicates that location and additional living space may act as key differentiators in higher-priced housing segments.
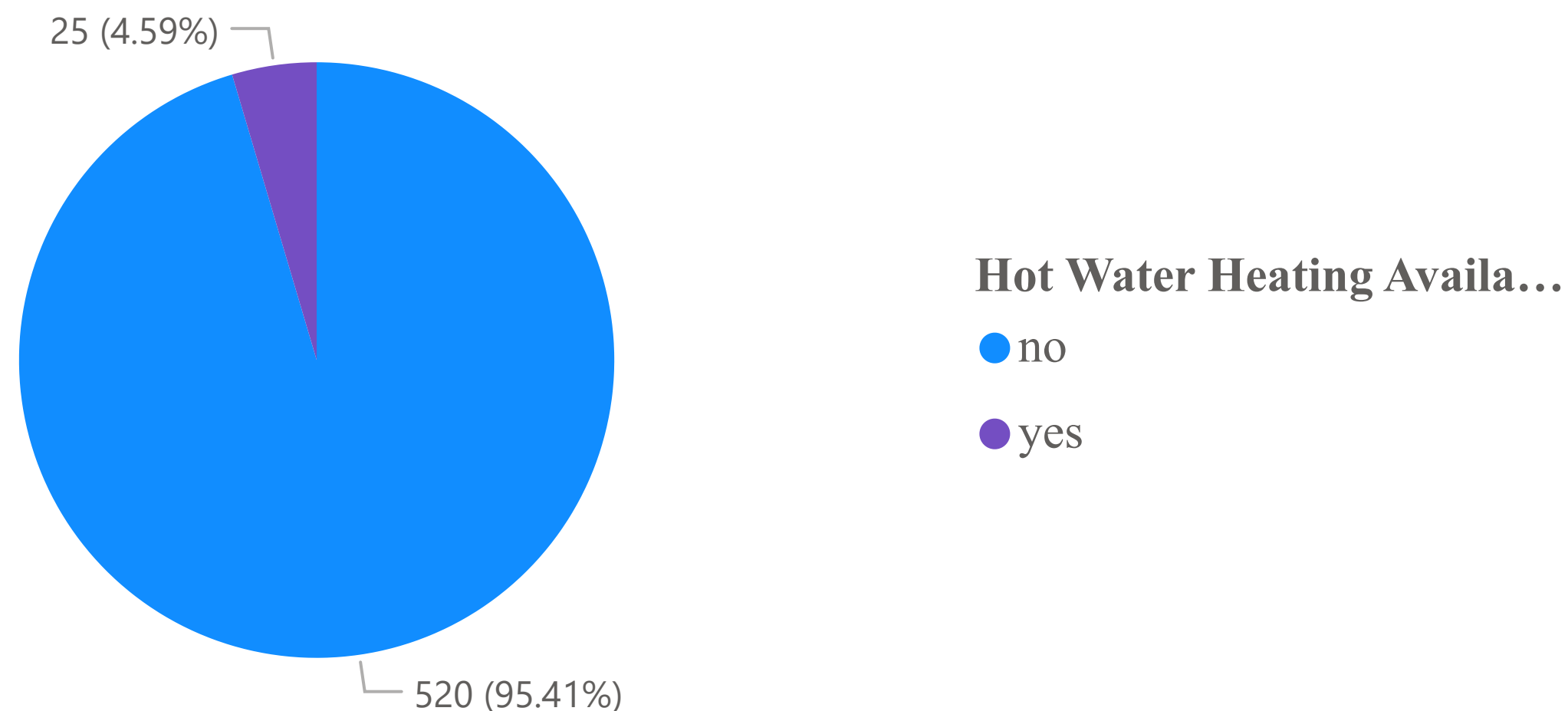
Distribution of Houses by Airconditioning Availability
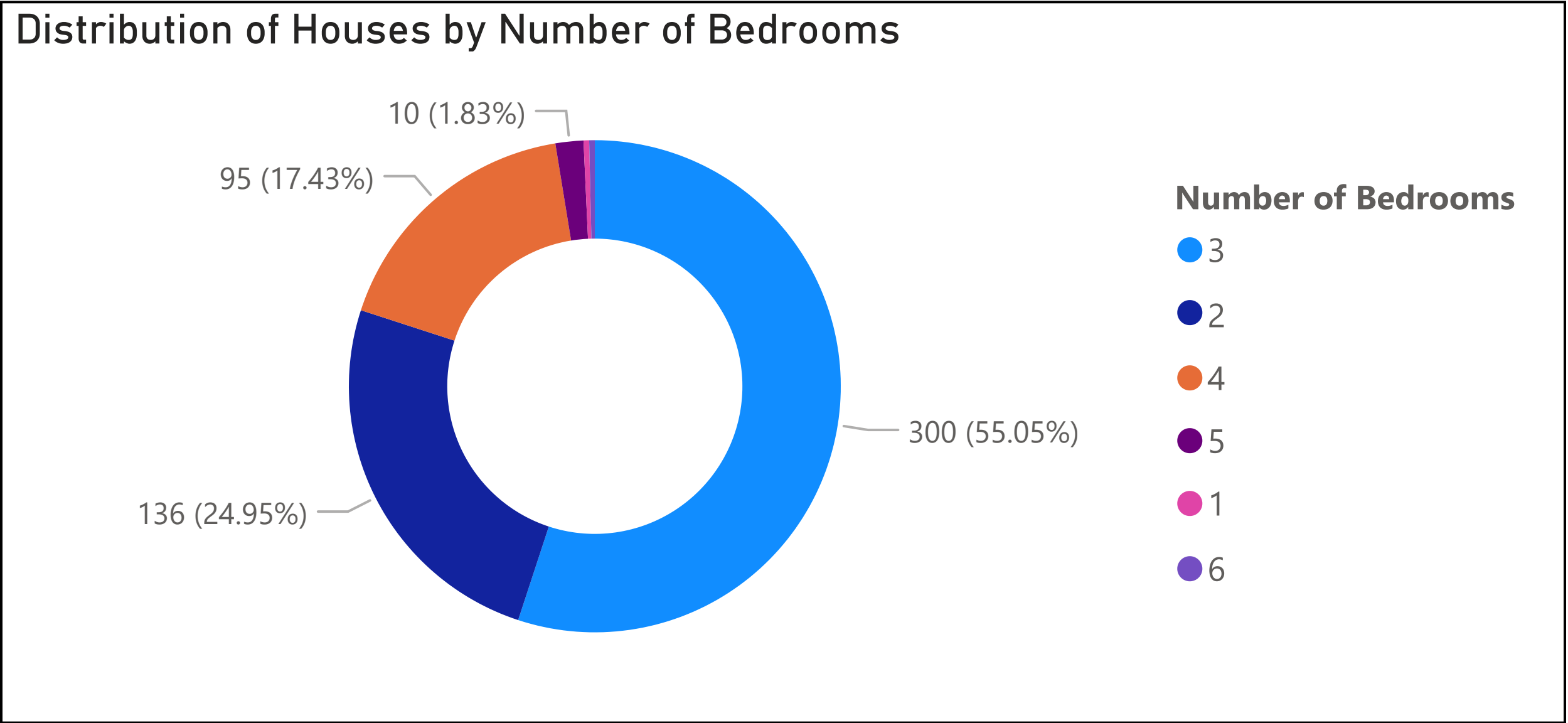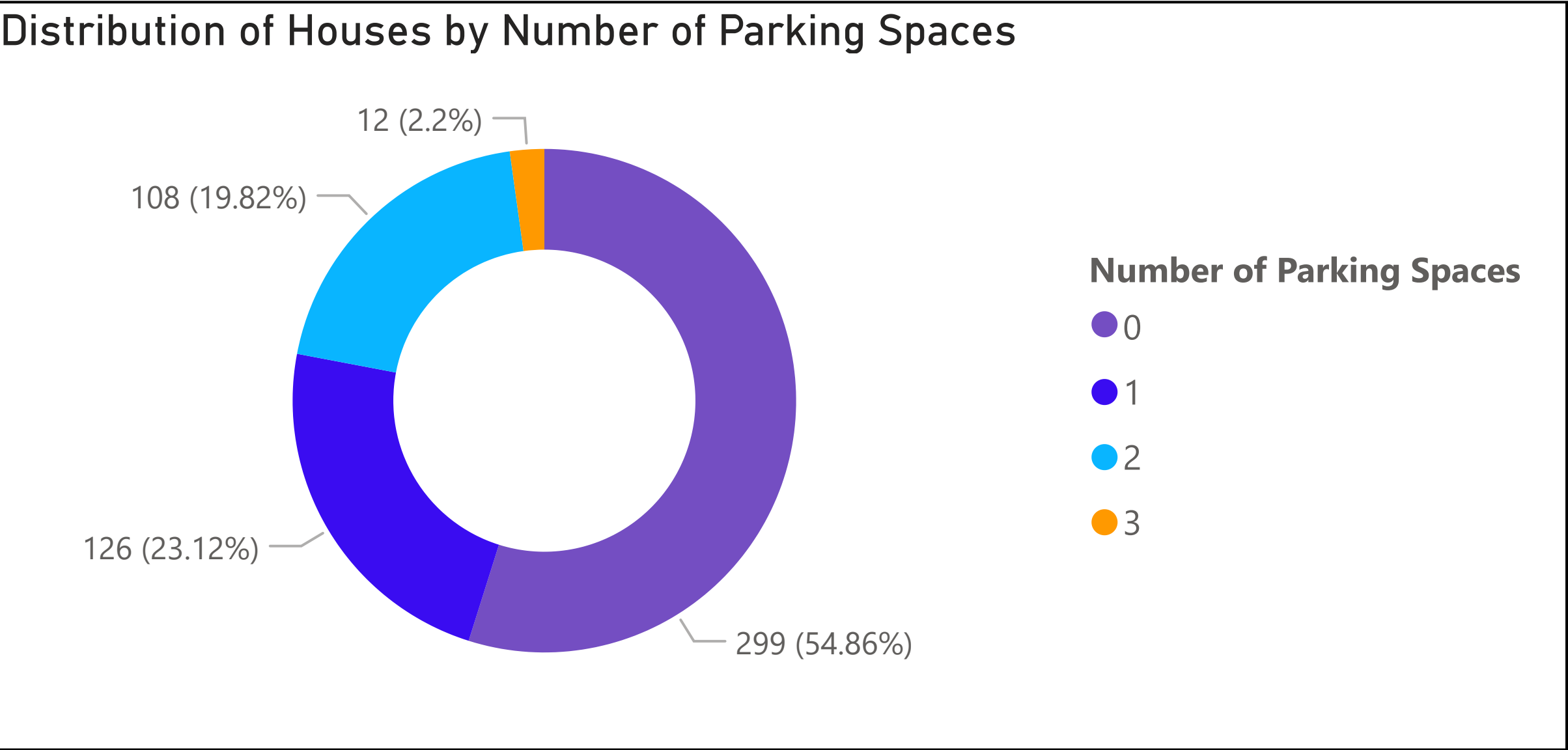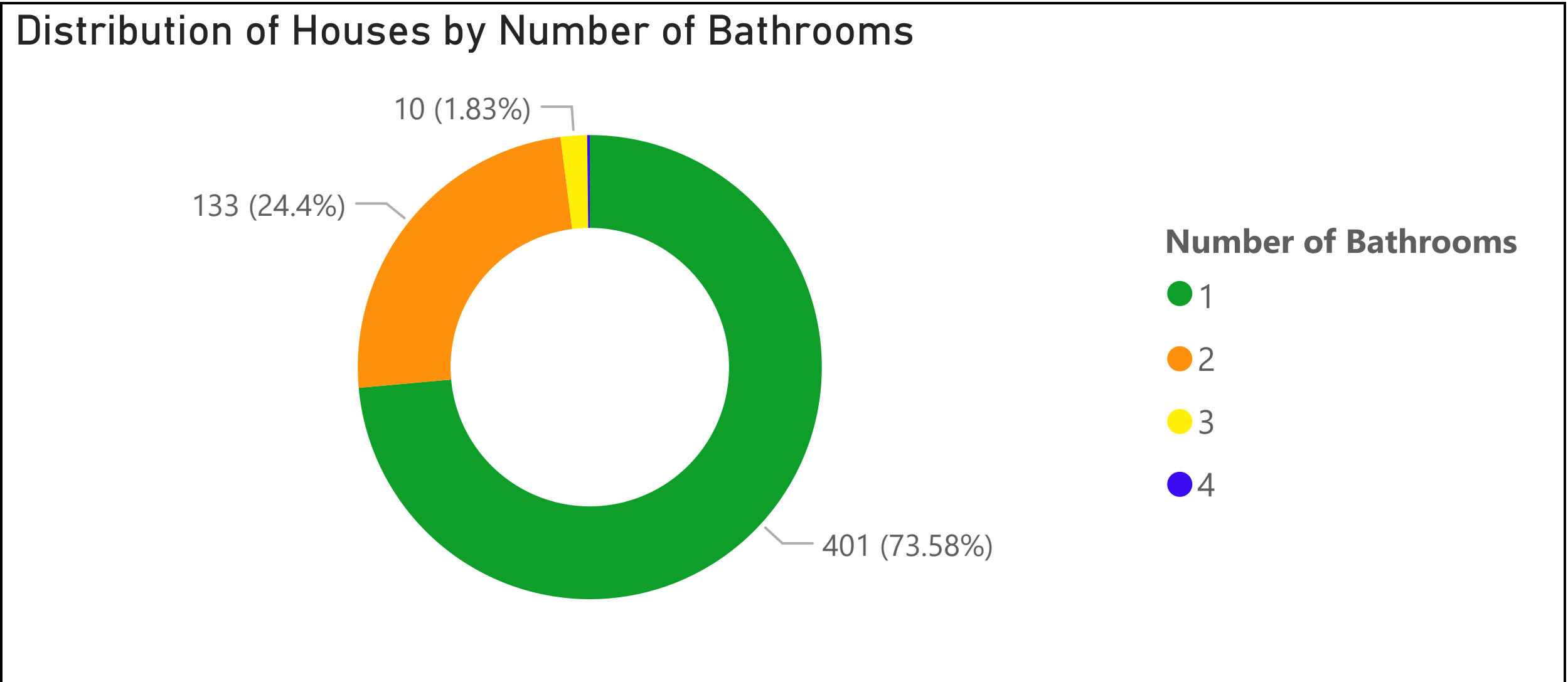

172 (31.56%)

373 (68.44%)

Airconditioning Availability
- no
- yes
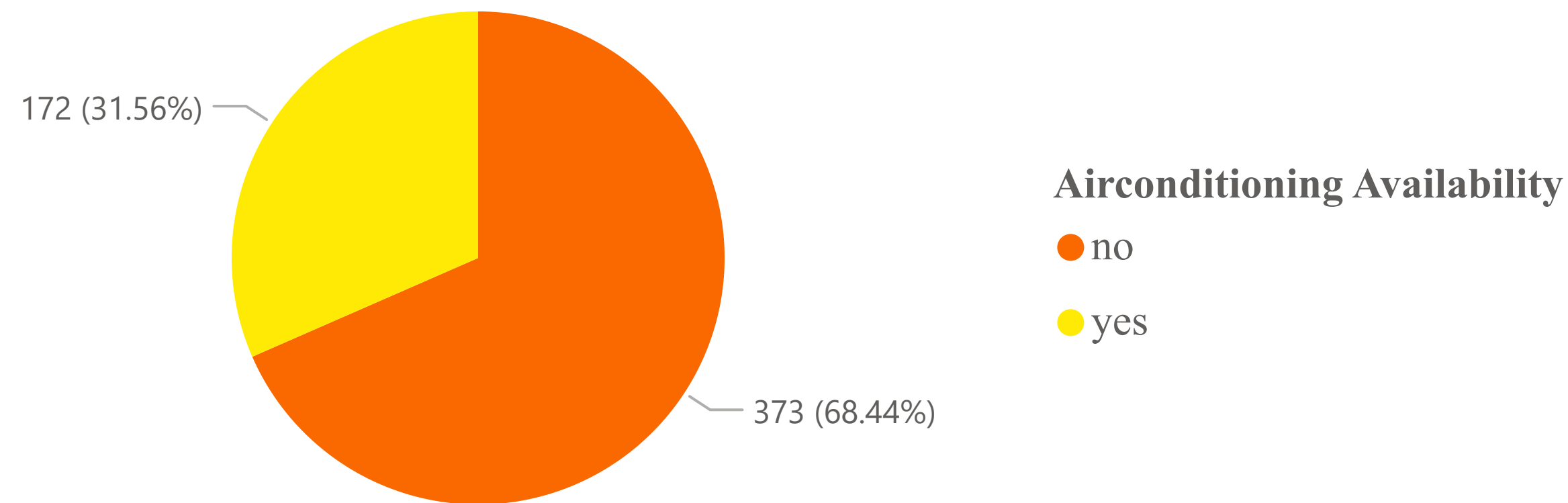
Distribution of Houses by Basement Availability

191 (35.05%)

354 (64.95%)

Basement Availability
- no
- yes
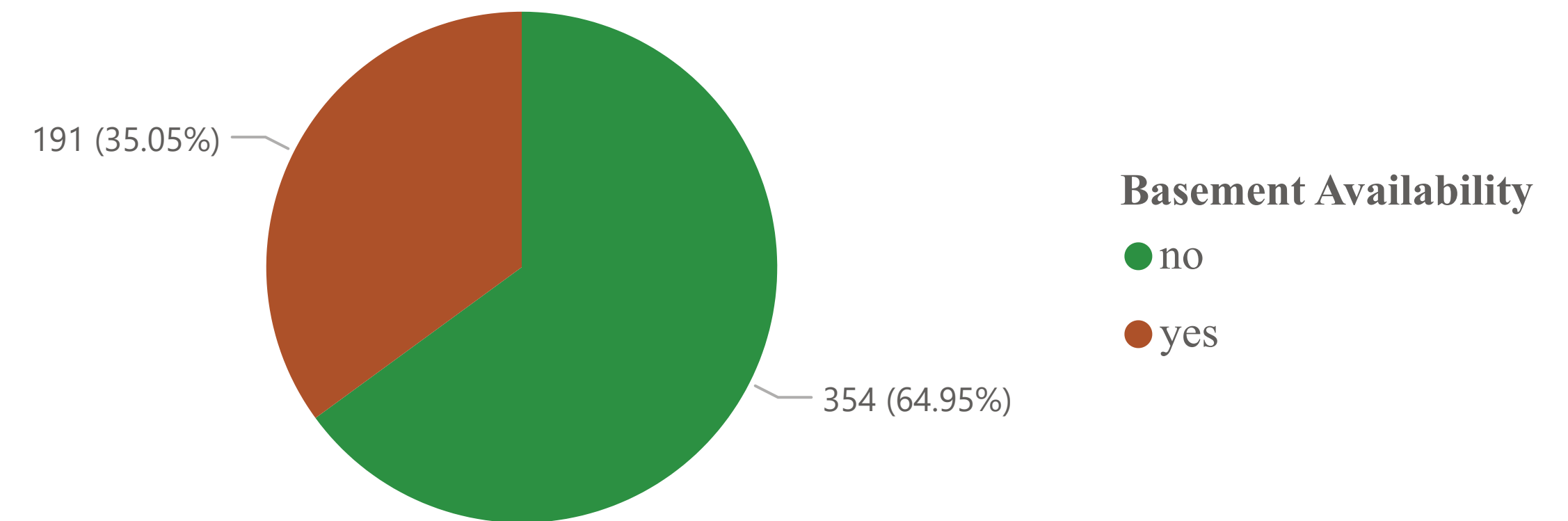
Distribution of Houses by Hot Water Heating Availability

25 (4.59%)

520 (95.41%)

Hot Water Heating Availa…
- no
- yes

Interpretation: Premium amenities such as air conditioning, basements, and hot water heating are present in a minority of houses, indicating limited availability across the market. Their relative scarcity suggests that these features act as differentiators rather than standard offerings and are likely to contribute to higher property value and attractiveness when present.

Distribution of Houses by Number of Stories

- 238 (43.67%)
- 227 (41.65%)
- 41 (7.52%)
- 39 (7.16%)

Number of Stories
- 2
- 1
- 4
- 3

Distribution of Houses by Number of Bathrooms

- 10 (1.83%)
- 133 (24.4%)
- 401 (73.58%)

Number of Bathrooms
- 1
- 2
- 3
- 4

Distribution of Houses by Number of Parking Spaces

- 12 (2.2%)
- 108 (19.82%)
- 126 (23.12%)
- 299 (54.86%)

Number of Parking Spaces
- 0
- 1
- 2
- 3

Distribution of Houses by Number of Bedrooms

- 10 (1.83%)
- 95 (17.43%)
- 300 (55.05%)
- 136 (24.95%)

Number of Bedrooms
- 3
- 2
- 4
- 5
- 1
- 6

Interpretation: The housing market is largely dominated by practical, family-oriented configurations, with most houses featuring one to two stories, three bedrooms, a single bathroom, and limited parking availability. Higher-end configurations—such as multiple bathrooms, additional stories, and multiple parking spaces—are relatively uncommon, indicating that these features may contribute to premium pricing when present.

Average House Prices Across Furnishing Categories
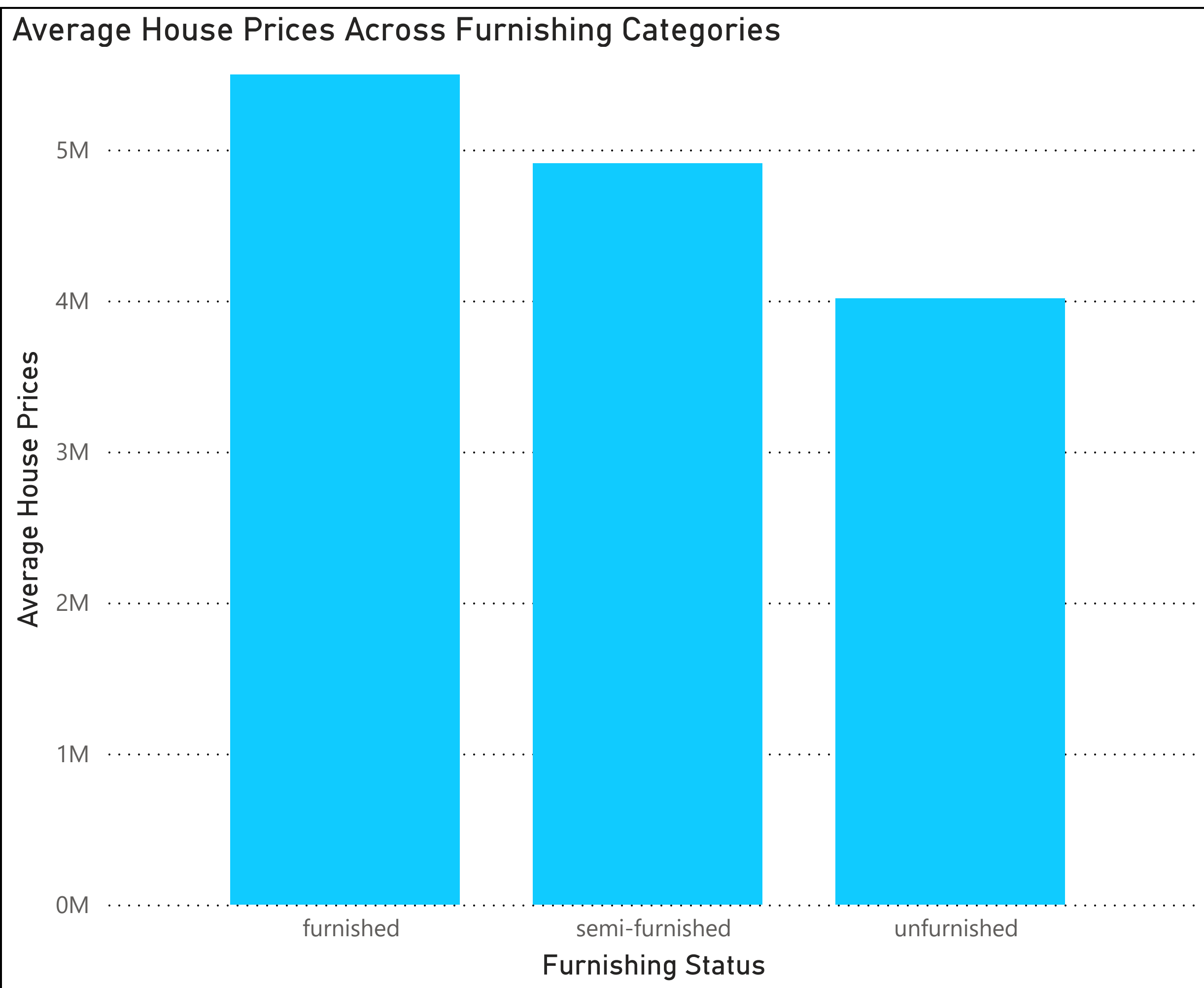
Interpretation: Furnished houses have the highest average prices, followed by semi-furnished and unfurnished properties, indicating that furnishing positively influences perceived property value.

Impact of Preferred Locations on Average House Prices
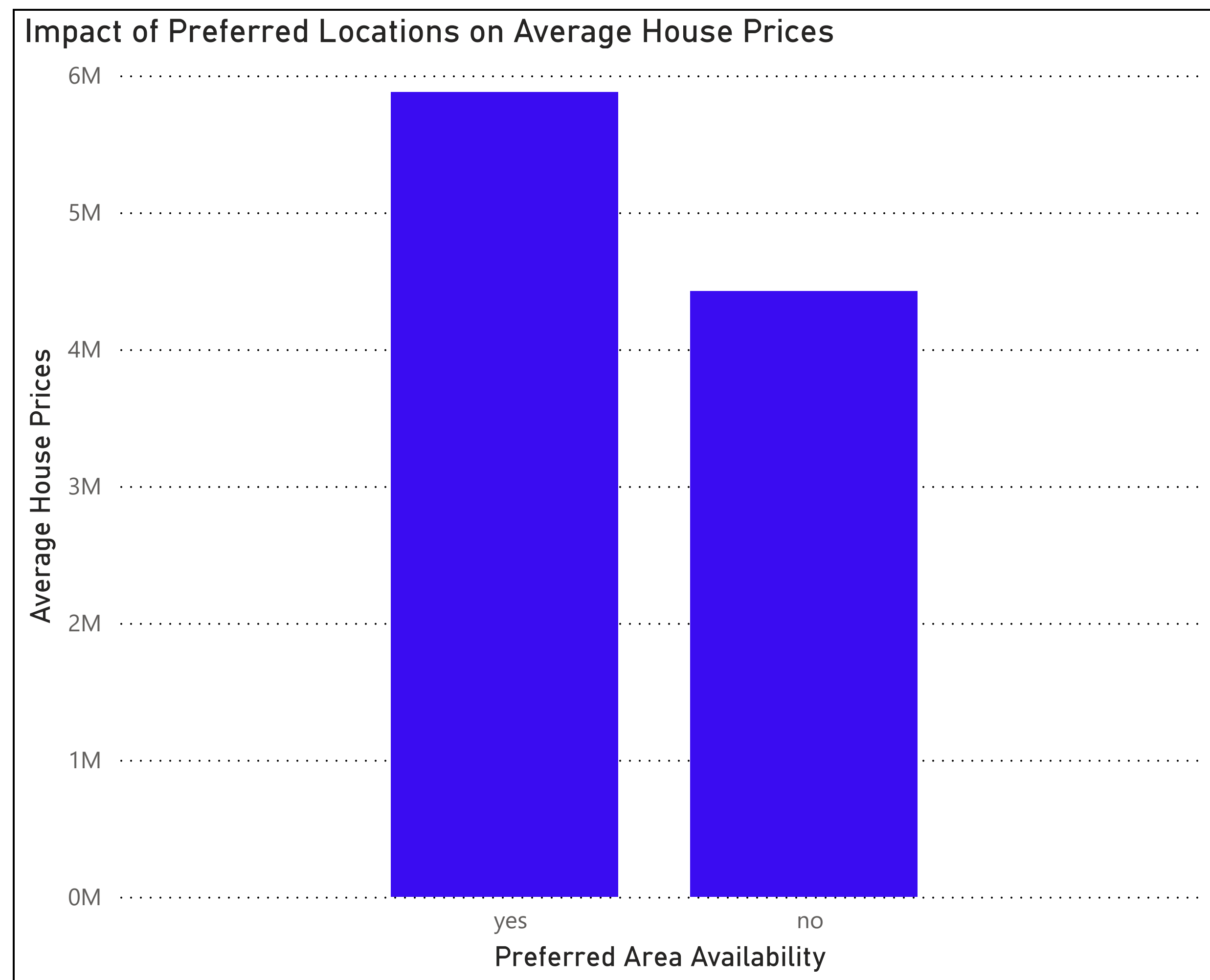
Interpretation: Houses located in preferred areas command substantially higher average prices, highlighting location as a key driver of housing value.

Average House Prices by Guestroom Availabilty
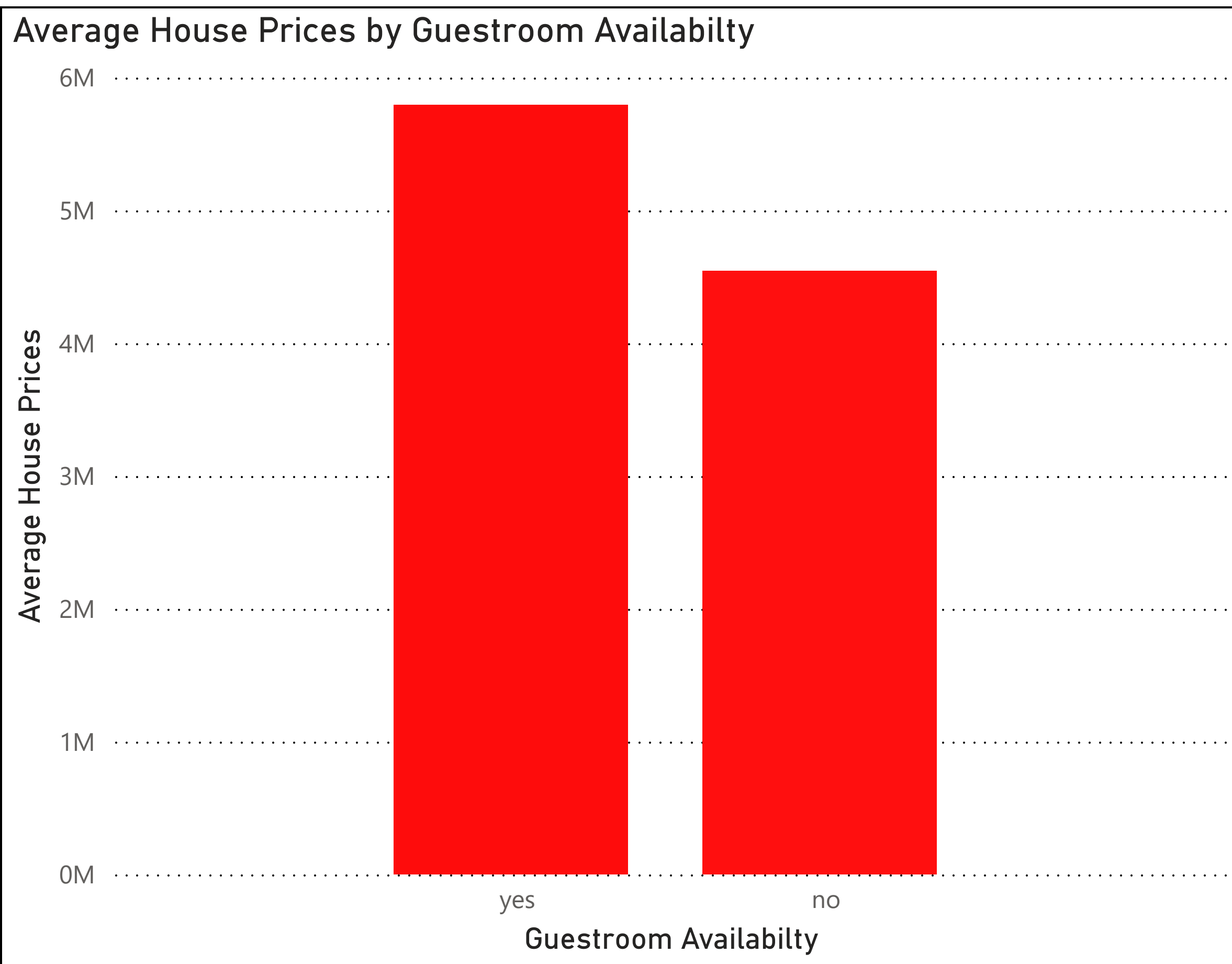

Interpretation: Houses with a guestroom have noticeably higher average prices, indicating that additional living space contributes positively to property value.

Average of price by Mainroad Access
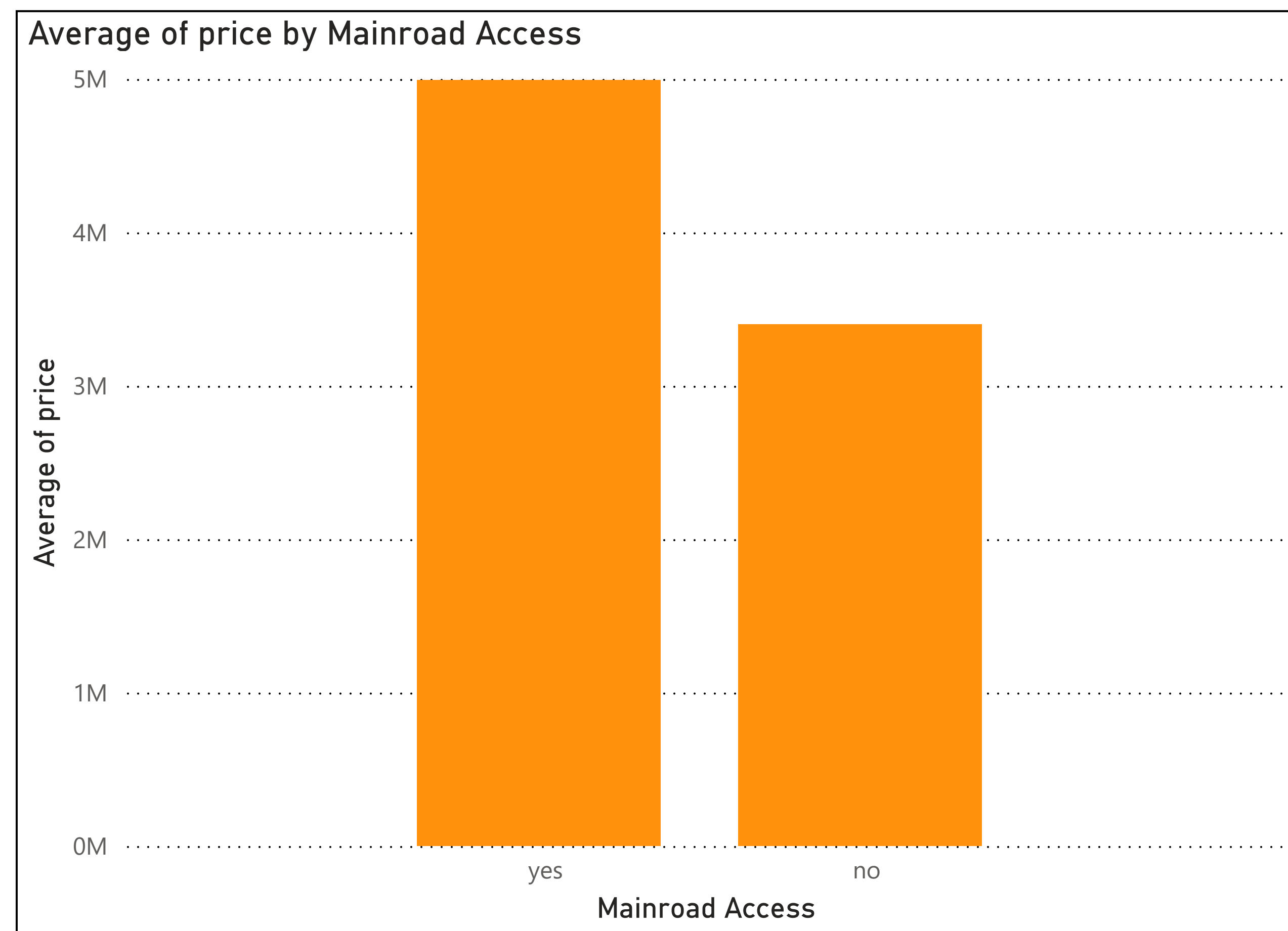
Interpretation: Properties with main road access command higher average prices, highlighting accessibility and connectivity as important factors influencing house prices.

Average House Prices by Basement Availability Status

Average House Prices by Hot Water Heating Status
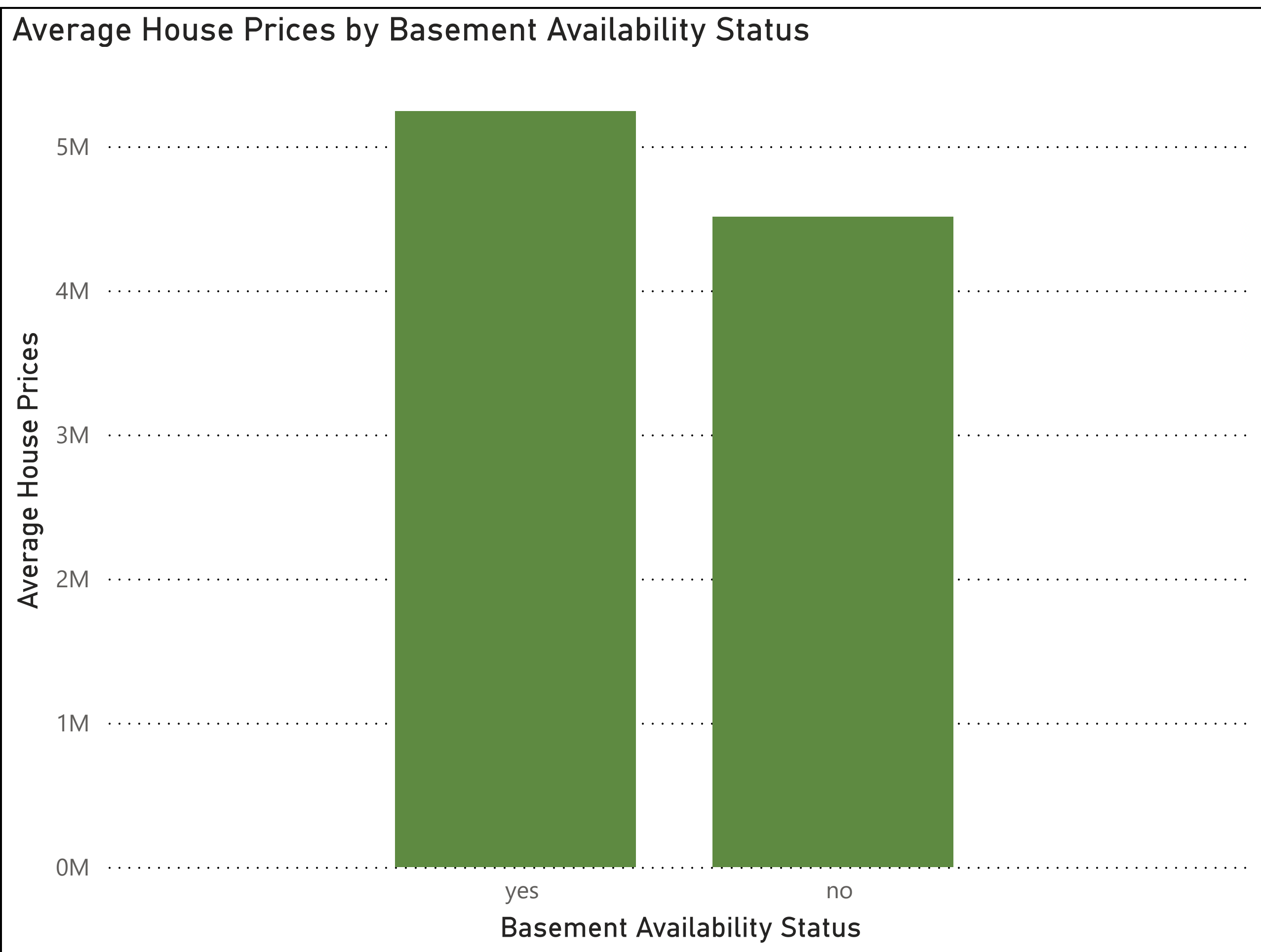
**Interpretation:** Houses with basements show higher average prices compared to those without, suggesting that basement availability contributes positively to property value.
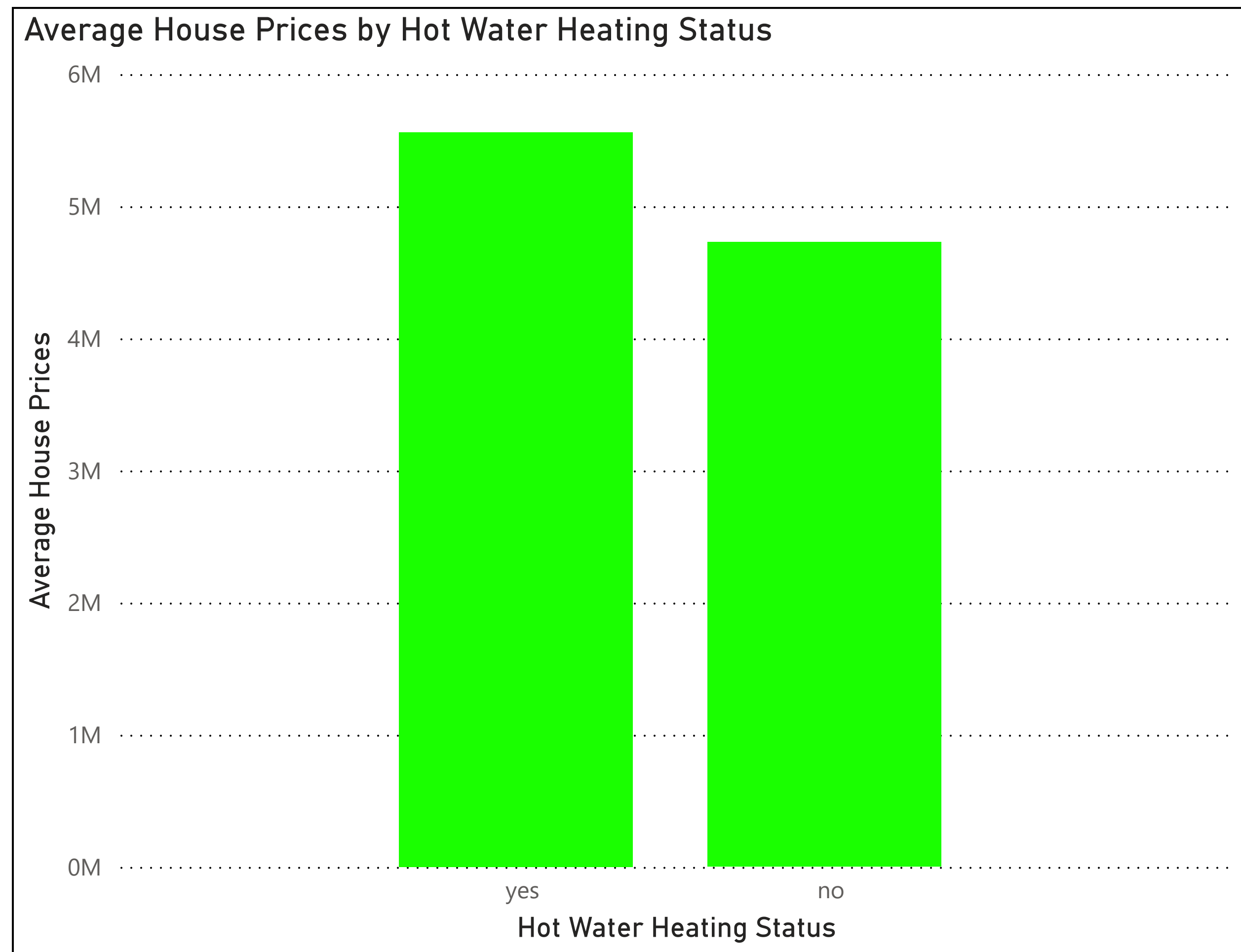
Interpretation: Properties with hot water heating exhibit higher average prices; however, given the low availability of this feature, this price difference should be interpreted cautiously, as it may reflect a premium range rather than a broad market trend.
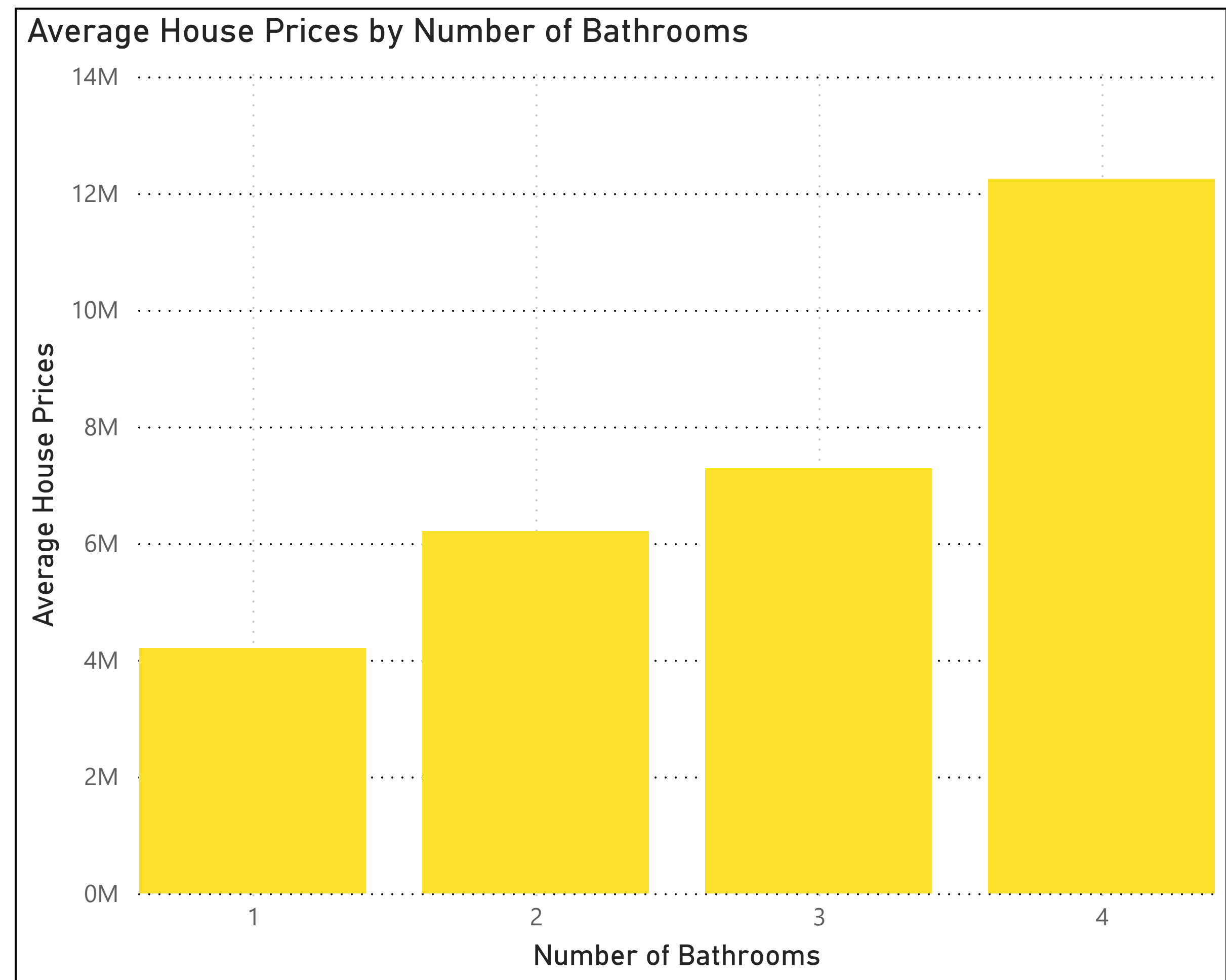
Average House Prices by Number of Stories

Average House Prices by Number of Parking Spaces
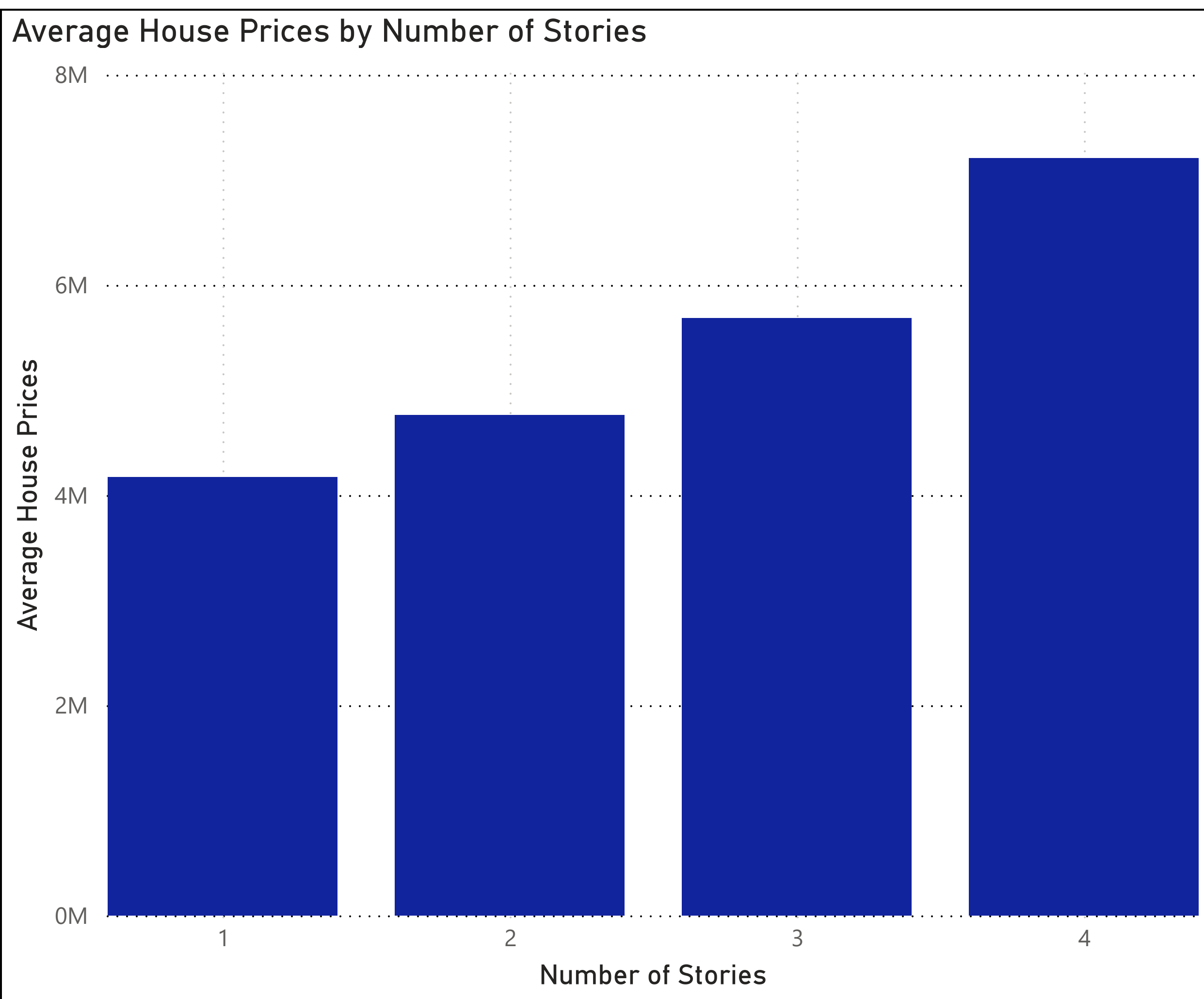
Interpretation: Average house prices generally increase with the number of stories, suggesting that multi-story houses command higher value due to larger usable space. However, the incremental price increase between higher story counts appears less pronounced, indicating potential diminishing returns beyond a certain level.
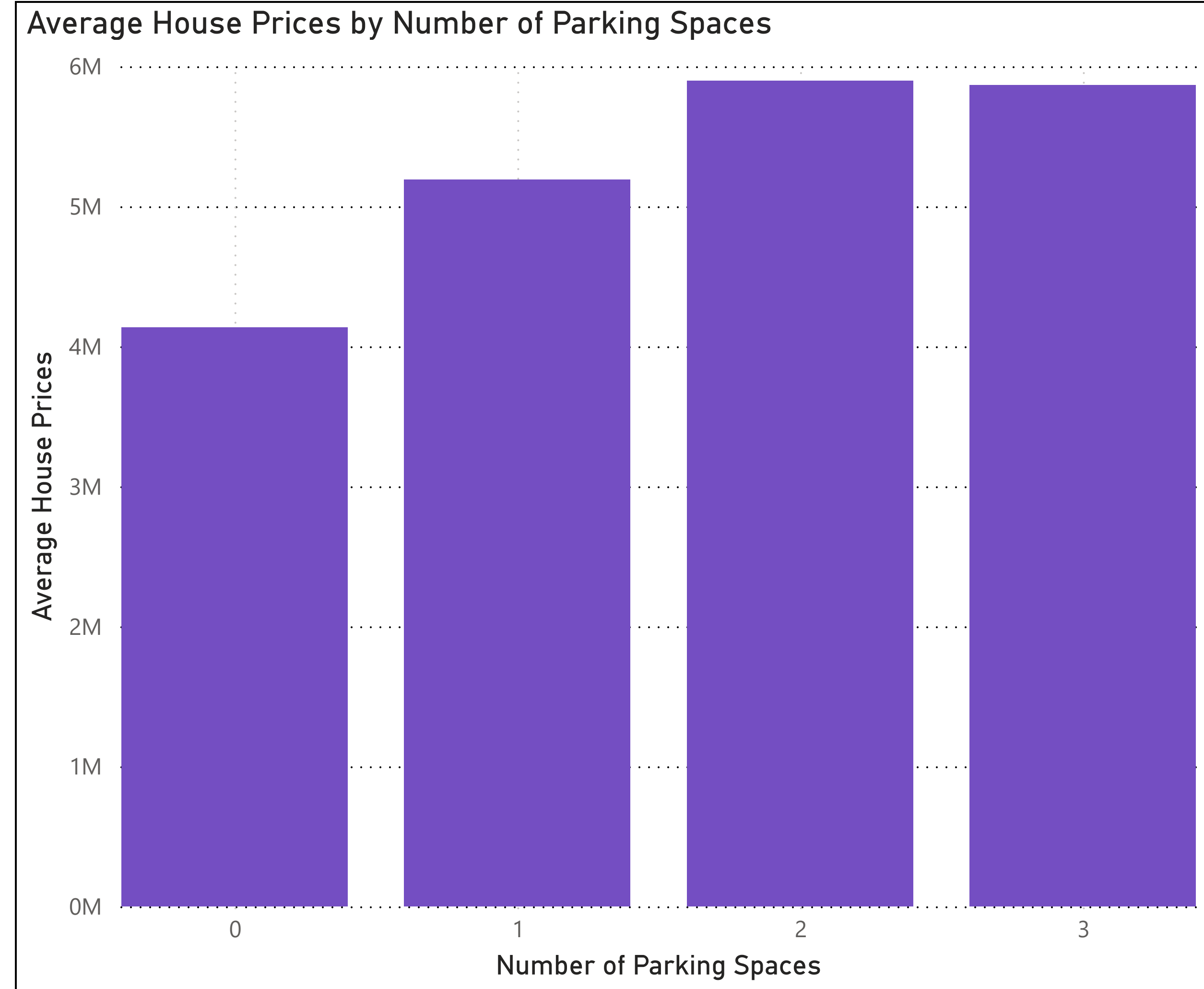
Interpretation: Houses with more parking spaces tend to have higher average prices, highlighting parking availability as a value-adding feature. However, the marginal price uplift reduces beyond two parking spaces, suggesting that parking adds value up to a practical threshold.

Average House Prices by Number of Bedrooms

Average House Prices by Number of Bathrooms
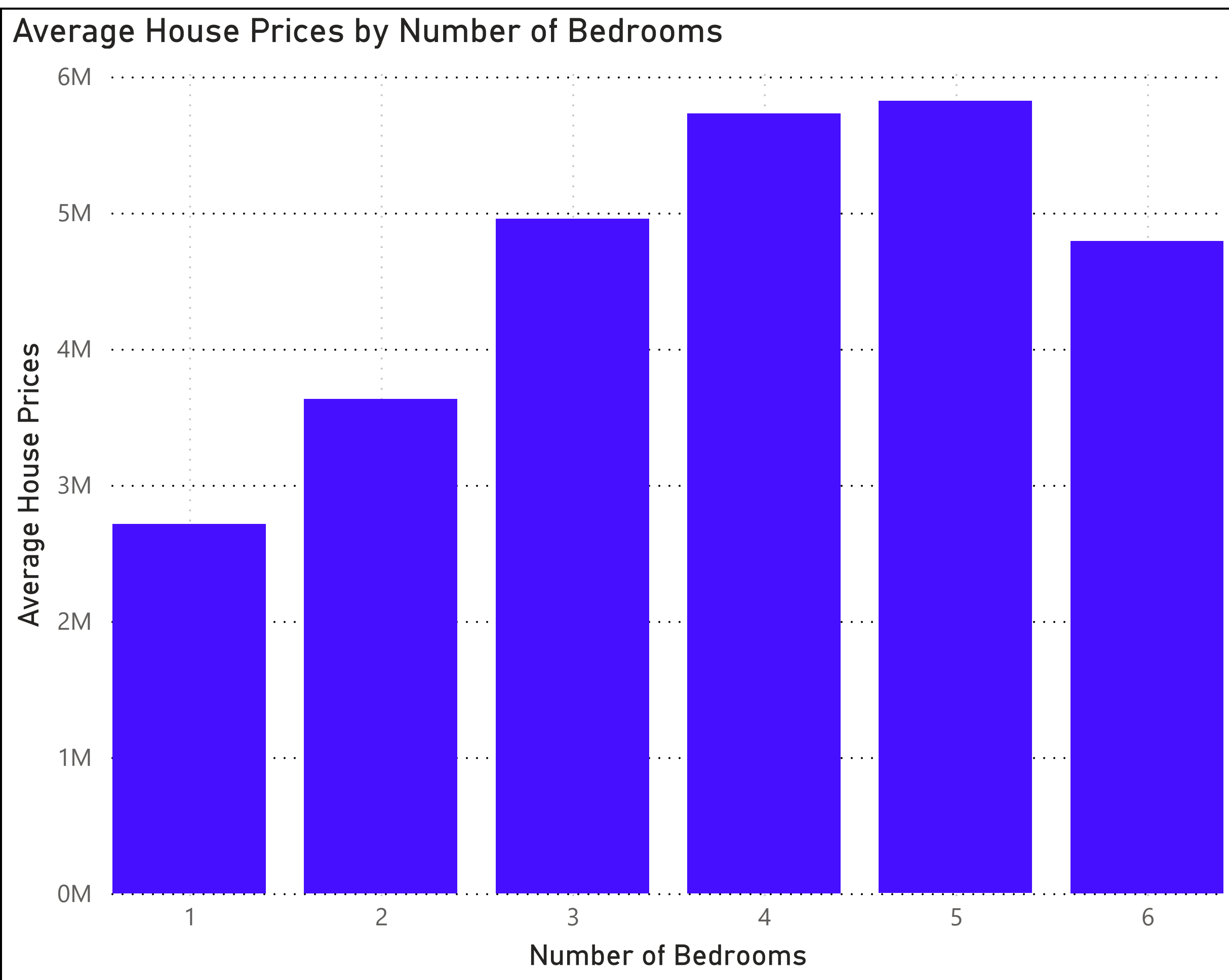
Interpretation: House prices generally increase with the number of bedrooms, indicating that larger homes command higher value; however, price gains plateau at higher bedroom counts, suggesting diminishing returns beyond a certain size.

Interpretation: Average house prices rise sharply with an increase in the number of bathrooms, indicating that bathrooms are a stronger driver of house prices than bedrooms due to their association with comfort and usability.

Key Insights
- Property area and number of bathrooms are the strongest drivers of house prices, showing a clear positive relationship with pricing.
- Location factors, especially availability in a preferred area and main road access, significantly increase property value.
- Premium amenities such as air conditioning, basement, guestroom, and hot water heating consistently lead to higher average prices.
- Furnishing status matters, with furnished houses commanding the highest average prices.
- The market is dominated by mid-sized, low-rise residential houses, indicating demand for practical, family-oriented housing.

Business Questions – Answers

Q1. Which factors have the greatest impact on house prices?
A1. Property area, number of bathrooms, preferred location, and availability of key amenities exert the strongest influence on house prices.

Q2. How strongly does property area influence pricing?
A2. House prices increase significantly with area, showing a strong positive relationship, though other features also contribute.

Q3. Which amenities significantly increase property value?
A3. Air conditioning, basement, guestroom, and hot water heating show noticeable price uplift.

Q4. Does furnishing status justify higher prices?
A4. Yes, furnished houses have the highest average prices, indicating higher perceived value.

Q5. How do bedrooms, bathrooms, and stories affect house prices?
A5. House prices increase with additional bedrooms, bathrooms, and stories, with bathrooms exhibiting a stronger and more consistent impact than bedrooms.

Q6. Are preferred locations associated with premium pricing?
A6. Yes, houses in preferred areas command substantially higher prices compared to others.

Q7. What is the dominant housing configuration in the market?
A7. Three-bedroom, single-bathroom, one to two-story houses with limited parking dominate the market.

Q8. Which property features offer the highest price uplift?

A8. Larger area, multiple bathrooms, preferred location, and premium amenities provide the highest price uplift.\

Overall Ranking of Factors Affecting House Prices (Based on Observed Impact):

1. Property area
2. Number of bathrooms
3. Preferred location
4. Furnishing status
5. Premium amenities (basement, guestroom, air conditioning, hot water heating)
6. Number of stories
7. Parking availability
8. Number of bedrooms

Note: This ranking is based on exploratory analysis and observed price differences, not causal modeling.

Conclusion: This analysis highlights that while property size influences house prices, factors such as bathrooms, location, and premium amenities play a critical role in driving higher valuations. These insights can guide buyers toward value-driven features and help sellers and developers prioritize high-impact upgrades that maximize property value.