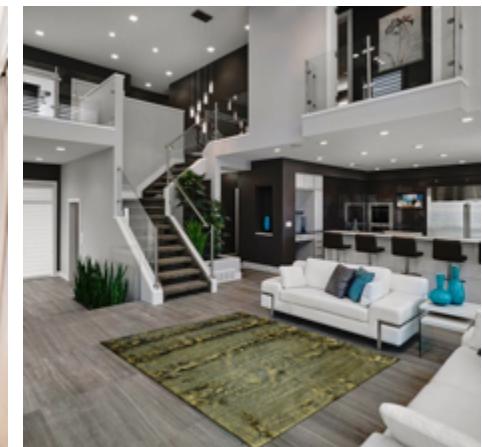


Where should you invest your money?



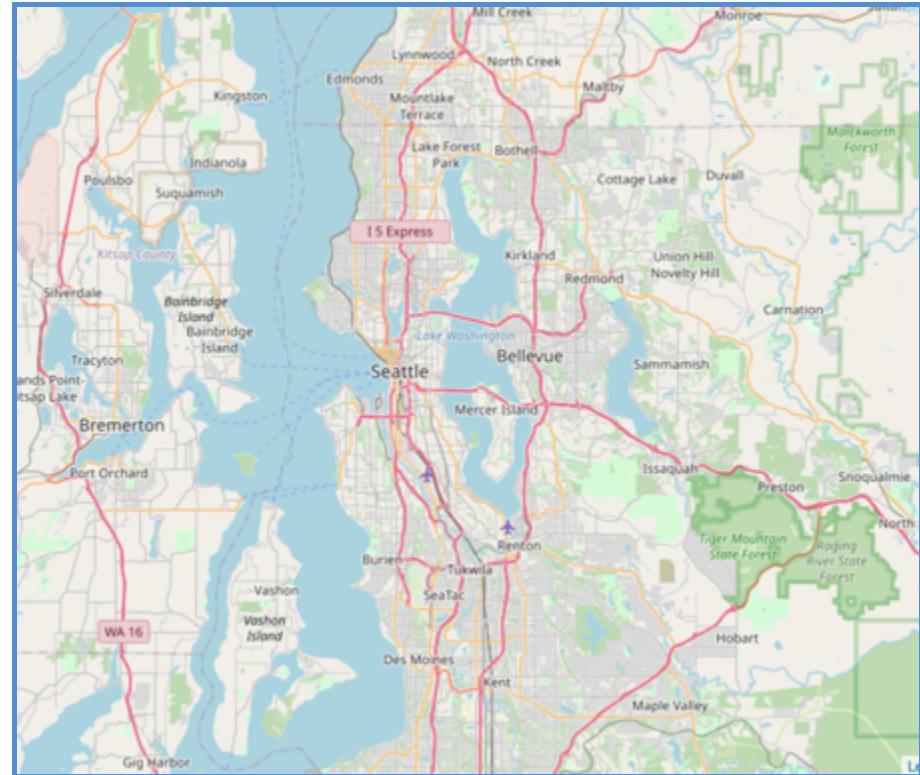
Project/Business Problem

Stakeholders: Investors trying to build a real state based portfolio in King County with the objective of diversifying their assets

Threshold: 1 million US\$ / property

Property specifications: None. Should be provided by us.

Database: King County dataset (years: 2014-2015)



Objectives

1. Find where would the best area to invest in King County
2. Compare house prices based on different characteristics
3. Create a Price Prediction Model
4. Analyze Model



Key Features

- Sectors

4 different sectors were created based on lat and long coord

- Square Footage

Analysis of the square footage price per sector

- Waterfront

Waterfront Avg. Price vs Inland Avg. Price

- Home Age

Comparison of new vs. older construction per sector

- Number of Bedrooms

Analysis of average price variation by number of bedroom per sector

- Bathrooms

Analysis of average price variation by number of bathrooms per sector



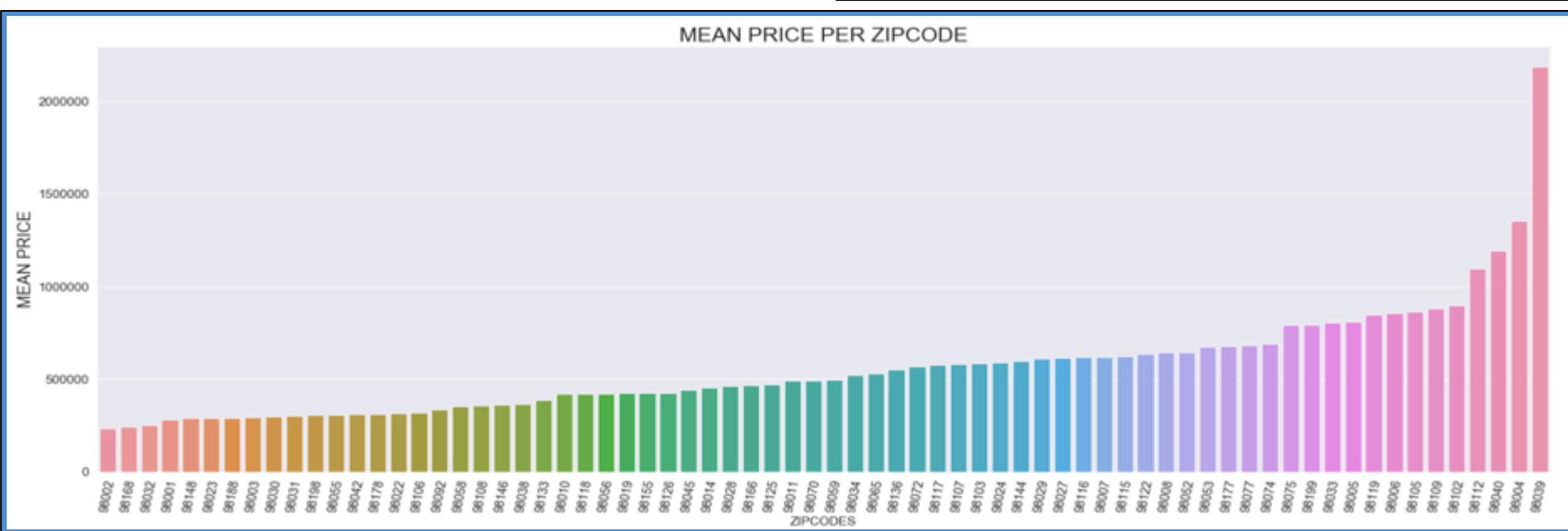
Questions

- Which sector should you be looking at? and, what price per square foot will you get?
- Should you be looking at the waterfront or in-land?
- Should you invest in new or older properties?
- How many bedrooms should you be looking at?
- How many bathrooms should you be looking at?



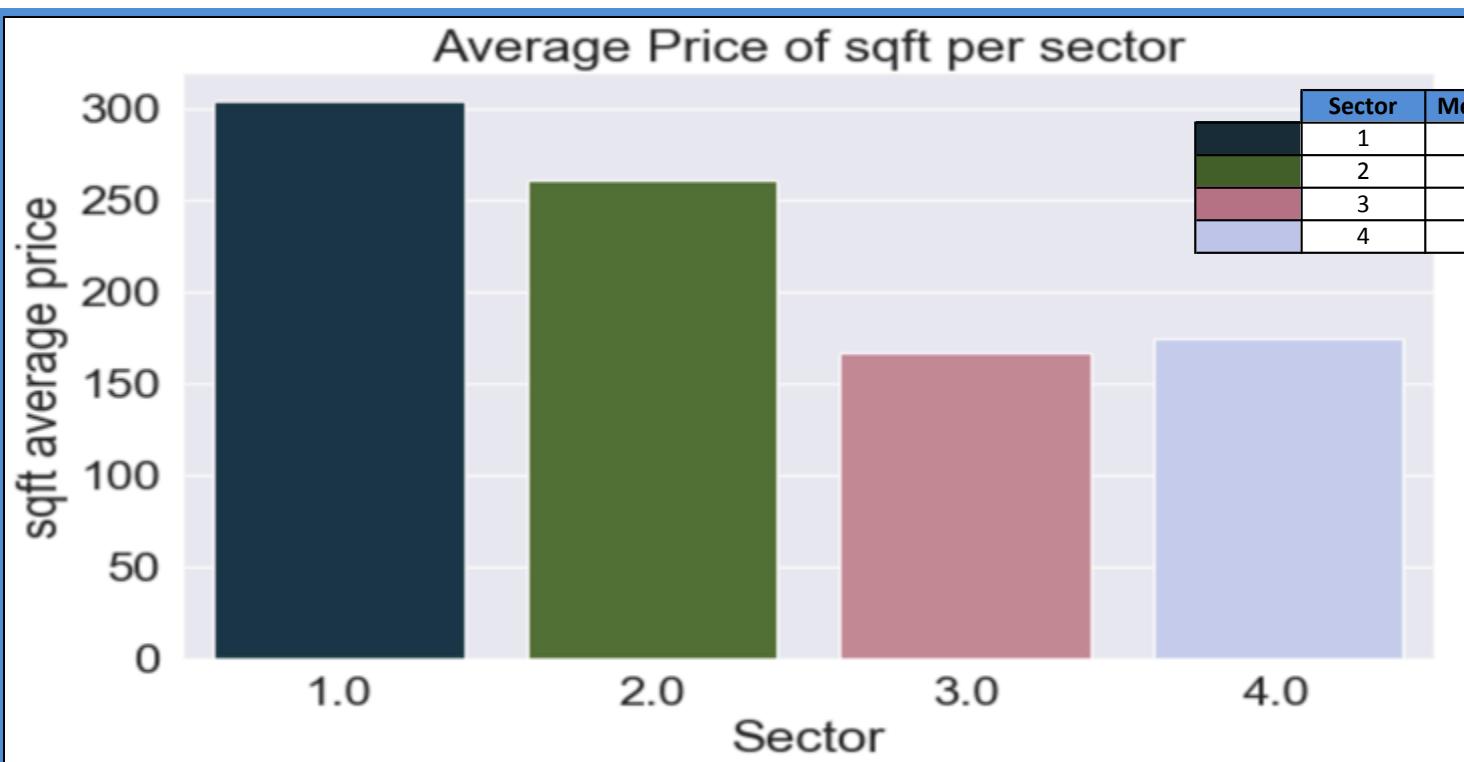
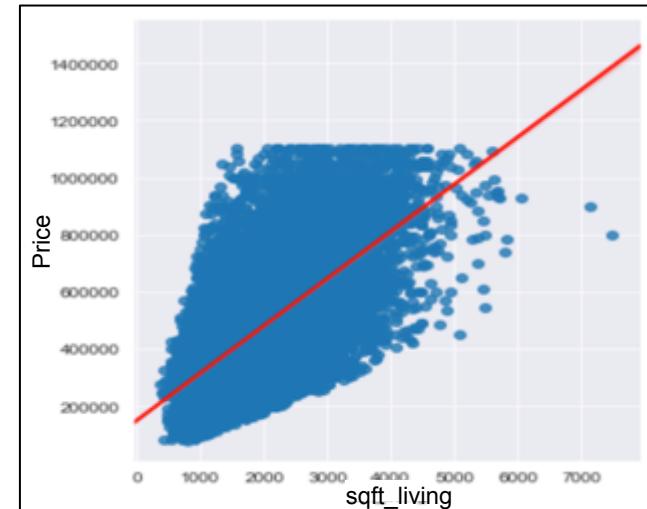
Sector Creation

- Dealing with 70 zip codes might be complicated, but ultimately it might result in a more accurate recommendation since the average price is clearly controlled by them
- Sectors managed to separate price ranges up to a certain degree and can be considered a good starting point



Which sector should you be looking at? and, what price per square foot will you get?

- Sector 1 contains the highest price per square foot
- Sector 2 covers the majority of the houses located in the waterfront
- Bigger houses within Sector 2 didn't pass the threshold/filter value of 1 million \$

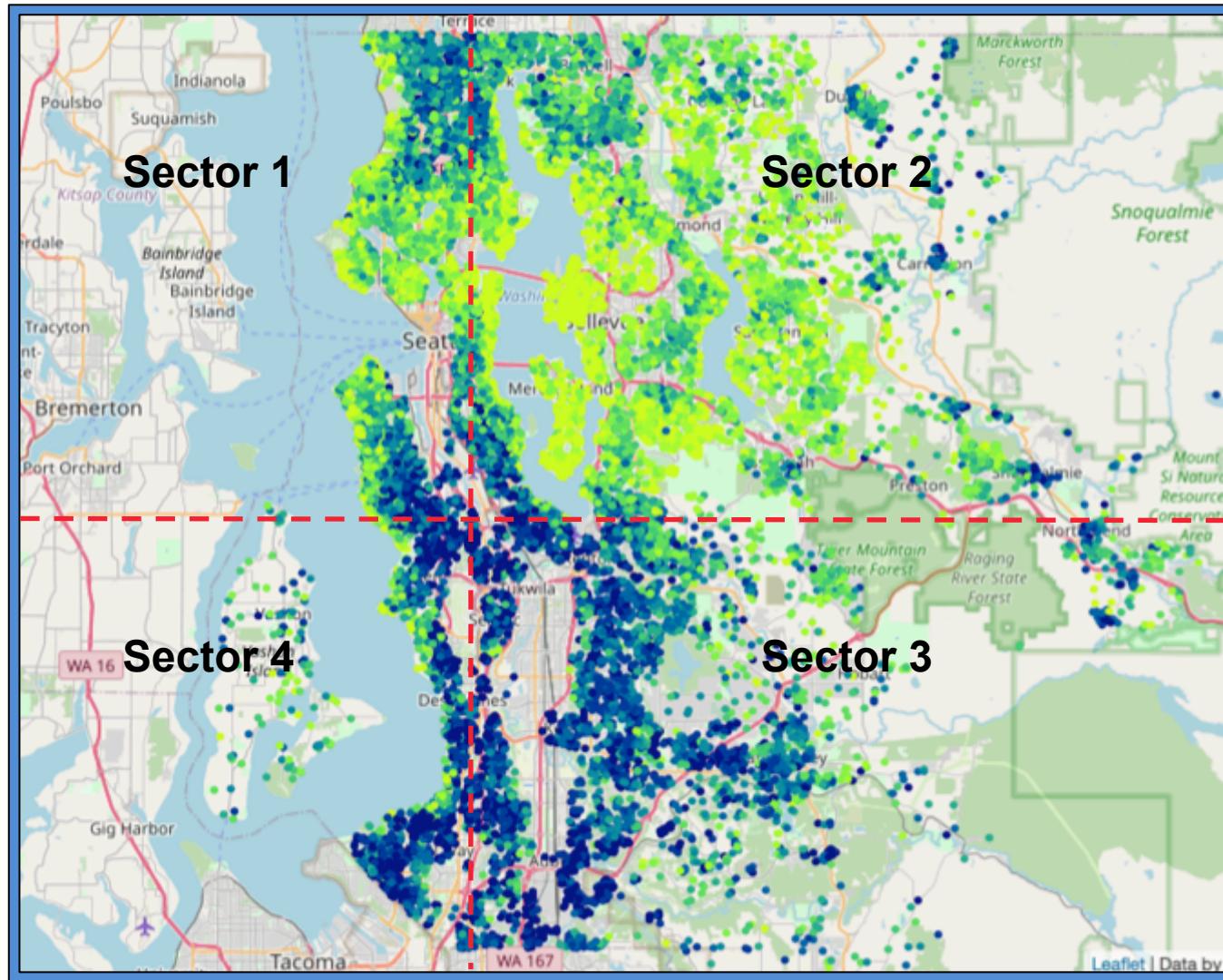


Should you be looking at the waterfront or in-land?

- Buying in the waterfront is always more expensive with the exception of Sector 3, which has the lowest average price
- With the exception of Sector 3, the price uplift from in-land to waterfront property is rather significant



Should you be looking at the waterfront or in-land?

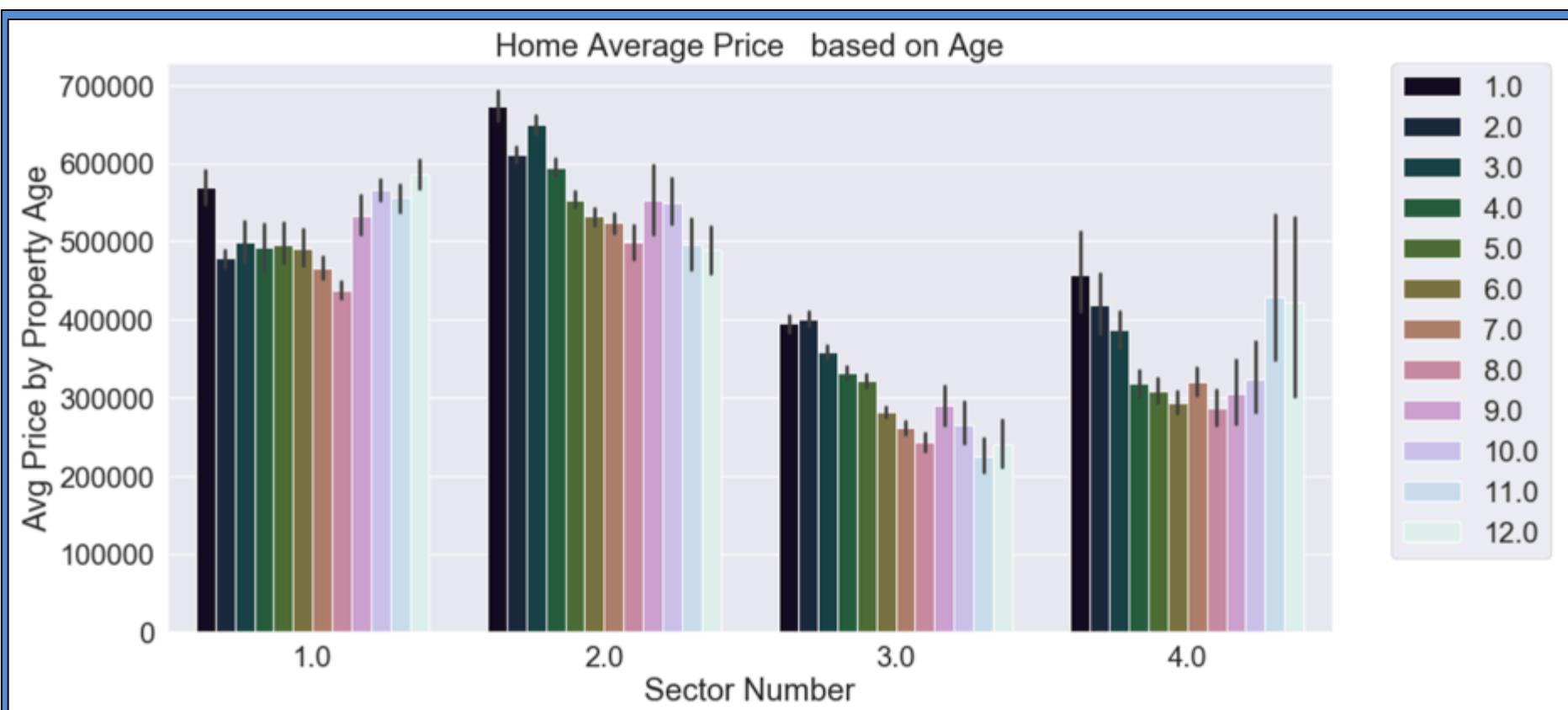


Color variation correlation with the water is quite clear

As expected, being in the waterfront will demand a higher price!

Should you invest in new or older properties?

- Price changes based on each sector, but in general the most recent construction has the highest price, with the exception of Sector 1
- The most expensive property overall is the 1 to 10 year construction from Sector 2, where most of the waterfront property is located



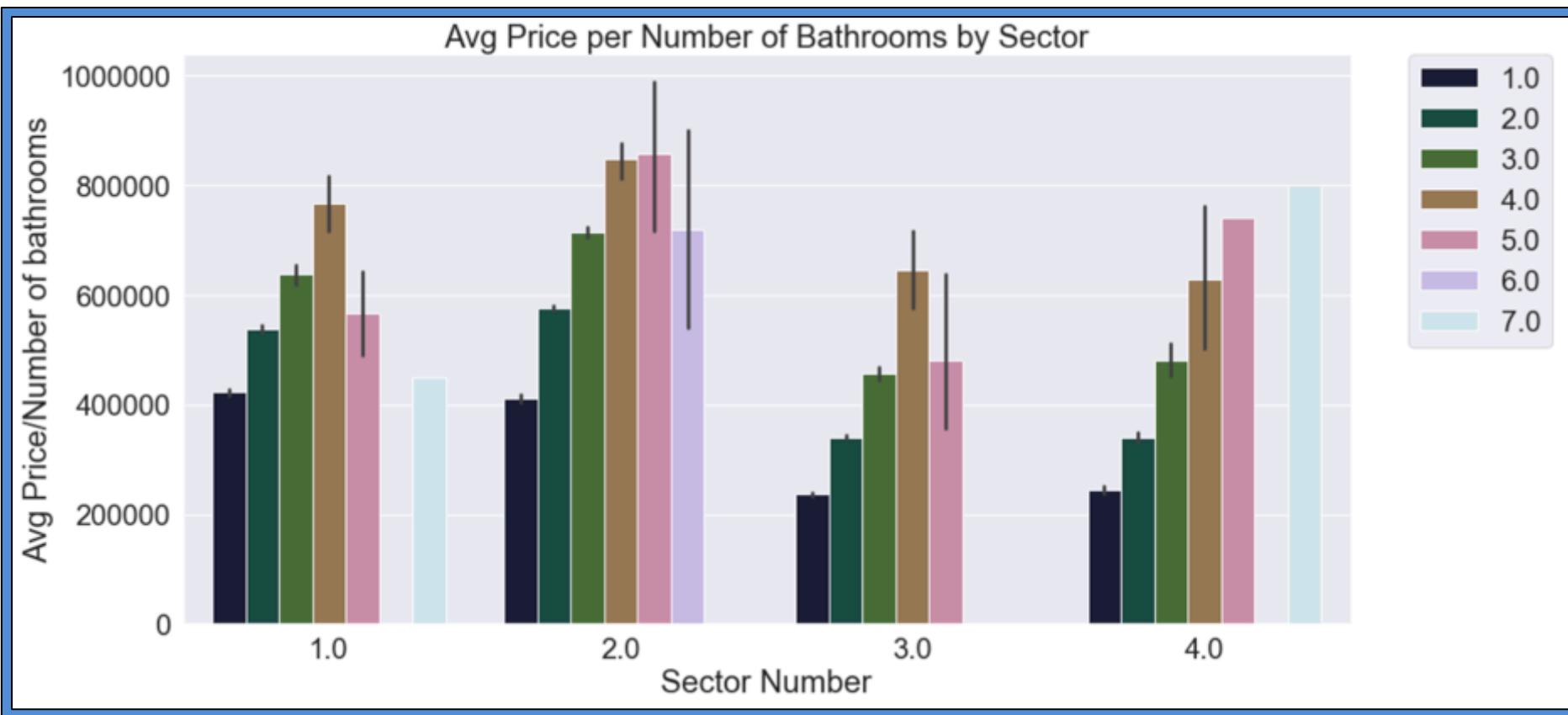
1.0	1-10	4.0	31-40	7.0	61-69	10.0	91-100
2.0	11-20	5.0	41-50	8.0	71-80	11.0	101-110
3.0	21-30	6.0	51-60	9.0	81-90	12.0	111-120

How many bedrooms should you be looking at?

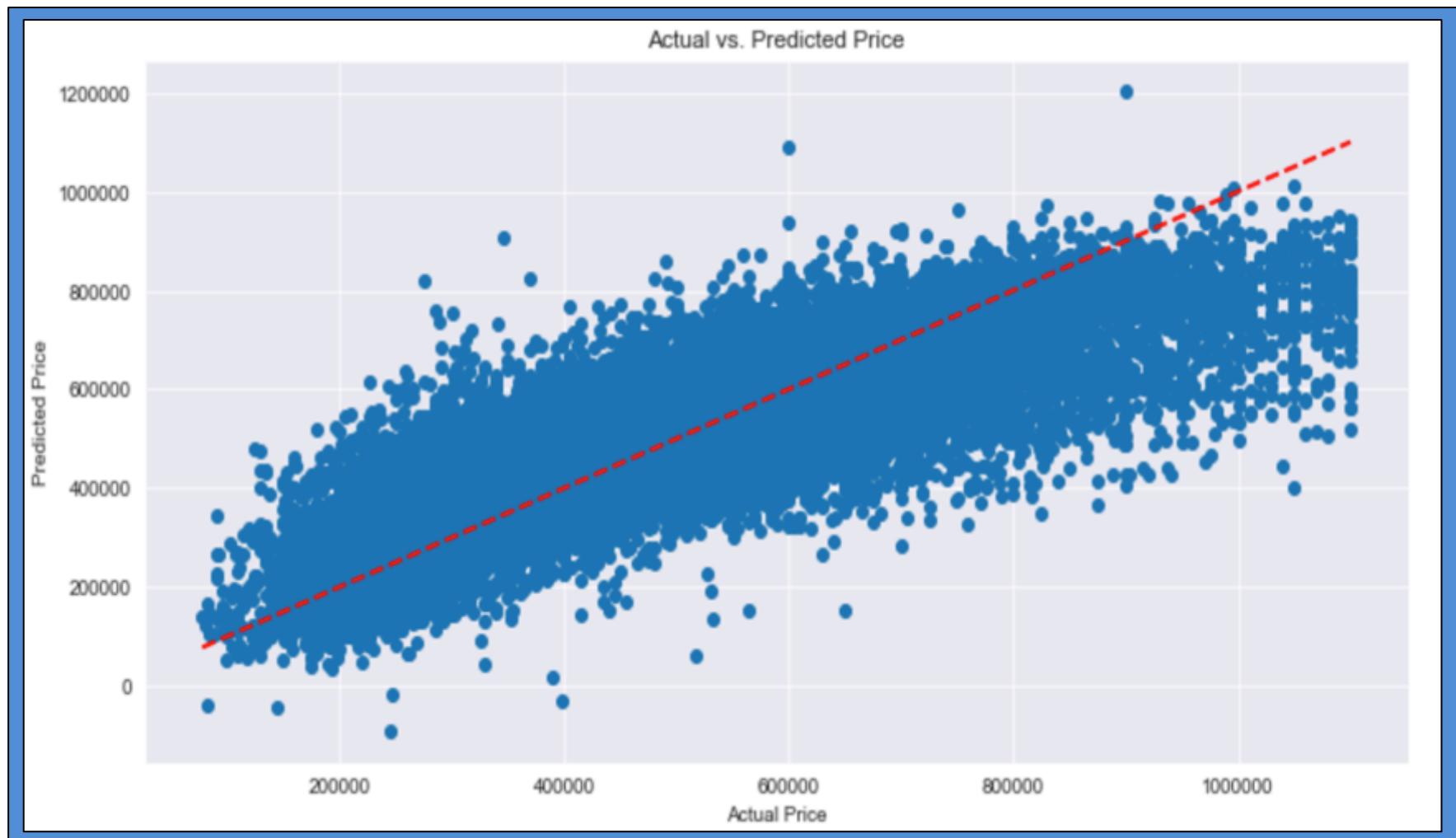


How many bathrooms should you be looking at?

- The higher the investment the higher the number of bathrooms, however after 4 the general trend is that prices start to drop with the exception of sector 4
- Section 2, with the majority of the properties on the waterfront, seems to be the most expensive



Actual vs. Predicted Price



Model Result Details

Input Data: King County dataset from 2014 - 2015

Metric: Mean Absolute Error (mse) & R²

R² : 0.693

Predictive Error (mse): 111,359% (11.3% on price range)

Price Range: 1,000,000\$ (~95% of the data)

Average Price: 468,468.61\$

SUMMARY:

- According to my model the Square foot of living and the square foot of living 15 are the main price predictors
- Other good predictors, with no specific order are the waterfront, renovations, and grade (Grade_C)
- Number of bedrooms not a strong predictor, and even with the additional EDA done it is hard to find a relationship
- Number of bathrooms is predictive, however we left it here because we don't understand how.



Recommendations

- Look for the best square footage within sector 1 and 2 taking into account the neighboring houses, and waterfront and renovations which will increase the price of homes.
- Within the given budget, stay between 600 to 700,000\$ to avoid entering the zone where the model under-predicts the prices by over 100,000\$
- For lower price homes, look into sector 4. With an average budget of 500,000\$ you can look at waterfront property with the same characteristics as those from sector 1 and 2 and be in a comfort zone with regards to price predictions



Way Forward

- Extending the study into individual zip-codes could not only refine the model but allow more accurate recommendations on specific locations of where to invest
- Get mode data :
 - The one available only covers 2014-2015 and as an investor it would be interesting to analyze price variations with time
 - School and public transportation distance to properties would be interesting to add to the model as well



*Thank
you*

