MANGT 830

Data Visualization Project

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Property Acquisition Report

Introduction

The real-estate market is hot! We've been waiting for the right opportunity to time the launch of our business, Strathe Renovation Partners, and I believe now is the perfect time to stake our claim in the residential property renovation business! By acquiring a property that can serve as a showpiece, we can use it in our branding and marketing materials as we launch the business and bring awareness to what we do, and hopefully attract the interests of more investors so we can continue to grow! In the Seattle, WA area, there are many potential properties, but I have narrowed it down to one which I believe is a perfect candidate.

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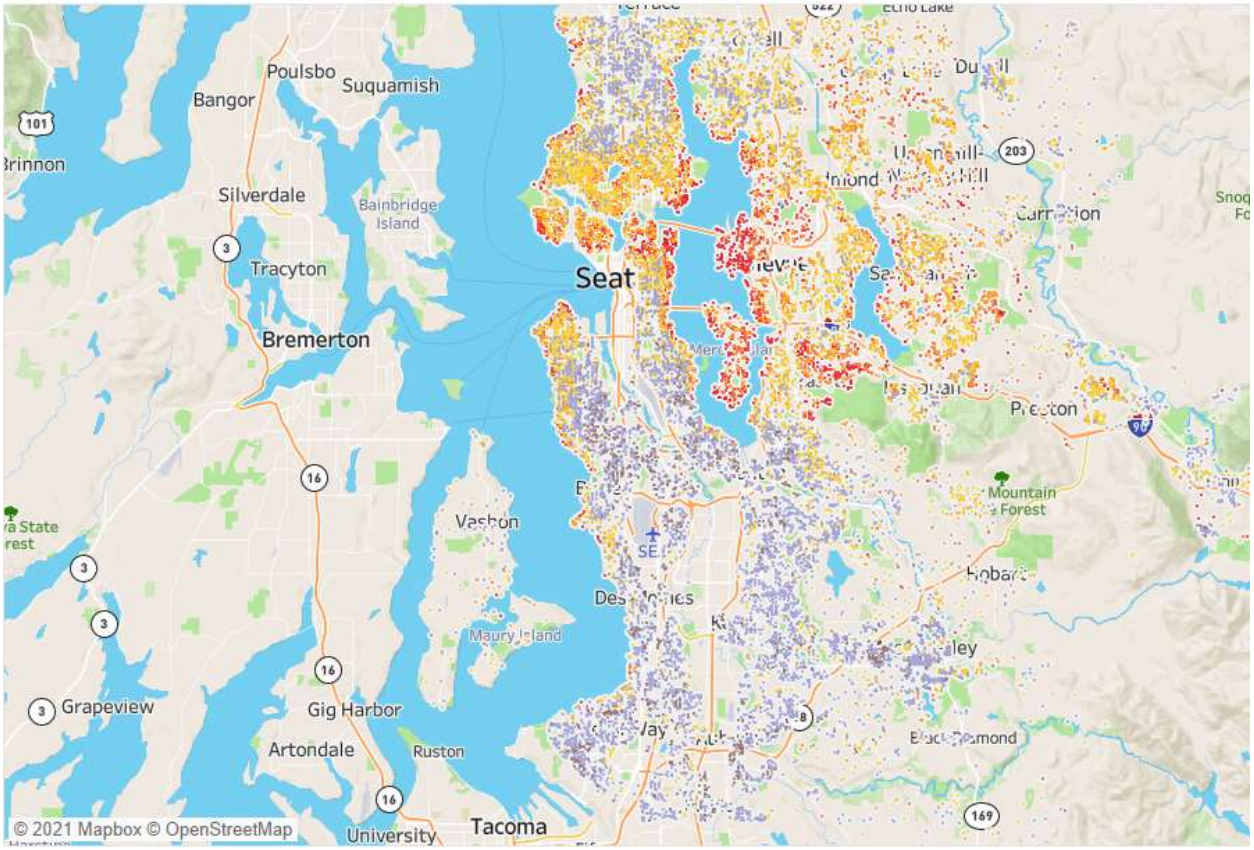
1. Seattle Residential Overview Map

Map

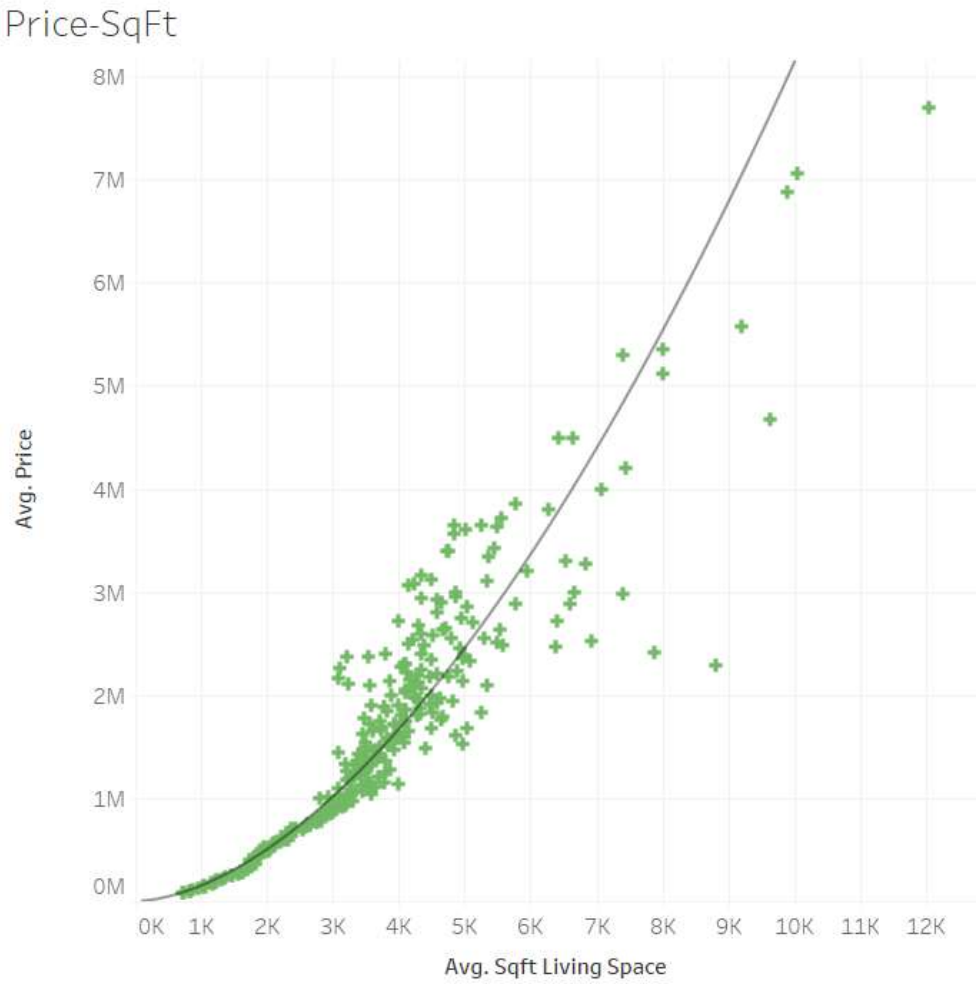


Map of Seattle overlaid with real estate sales, binned by price

Price Bins
- 0 - 200K
- 200K - 399K
- 400K - 599K
- 600K - 799K
- 800K - 999K
- Over 1M

The above visualization displays a map of the Seattle area, with a point marked for each of the 21,613 properties that we have data for. The property prices are binned by price range, with a different color representing each bin. This helps to get a general idea of the market and prices in this region.

2. Price-Sq. Footage Regression

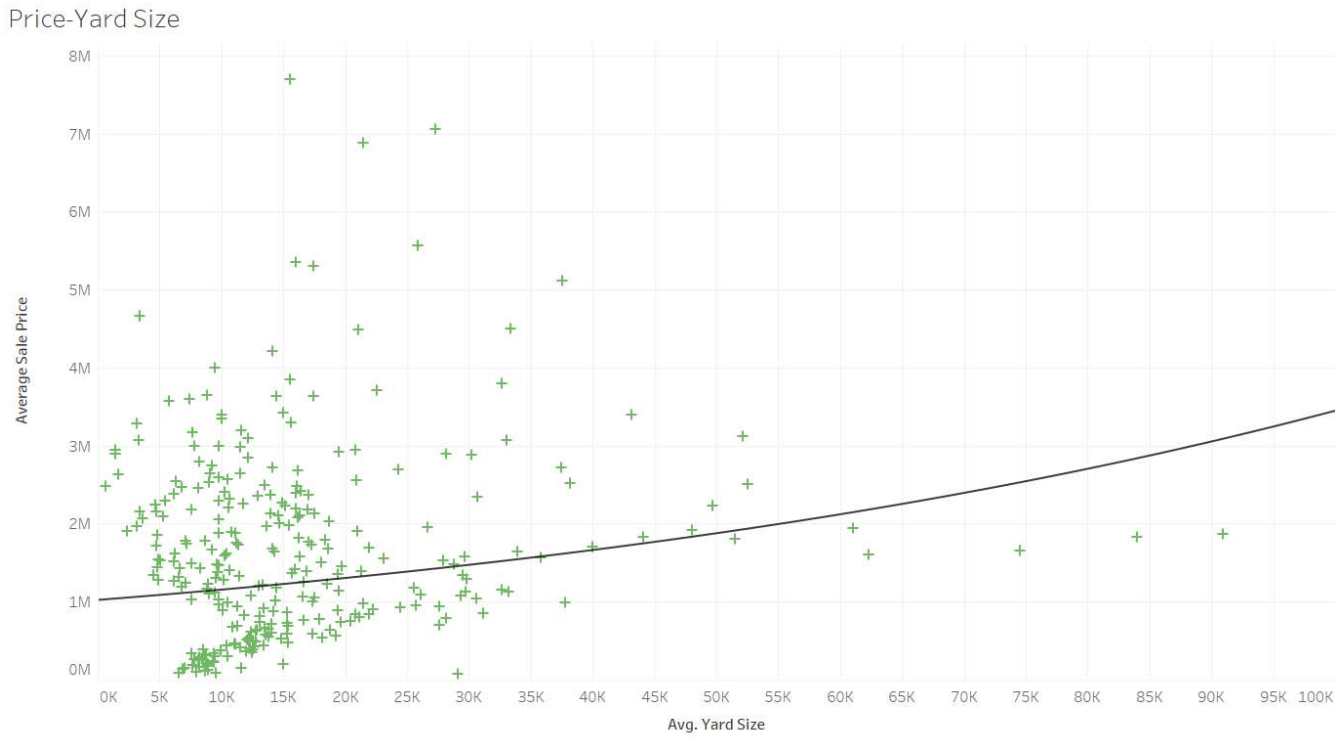


Average Square Footage plotted with Average Price.
The simple pricing model based on square footage is:
Equation: ln(Avg. Price) = 1.72754*ln(Avg. Sqft Living)
This model has an R-Squared value of 0.99 and p-value of < 0.0001

To get an idea of whether there's a return in value from adding-on to a property, I graphed the average square footage (living space) against the property price. And further, a trend-line and equation resulting from the data is shown. It looks like there are good price returns from adding to living space!

Note: Because the dataset consists of approximately 21,000 individual properties, for the purpose of price regressions, the properties have been binned by price for every $10K. Otherwise, plotting these relationships would require excessive computing resources. However, this does result in some inaccuracy to the pricing equation.

3. Price-Yard Size Regression



Average Sale Price with Yard Size.
Yard Size is a calculated field, subtracting Living Space Square Footage from the total Lot Square Footage. This formula is not completely accurate, as it does not account for non-living space that also takes up square footage; however, it is a good estimate.

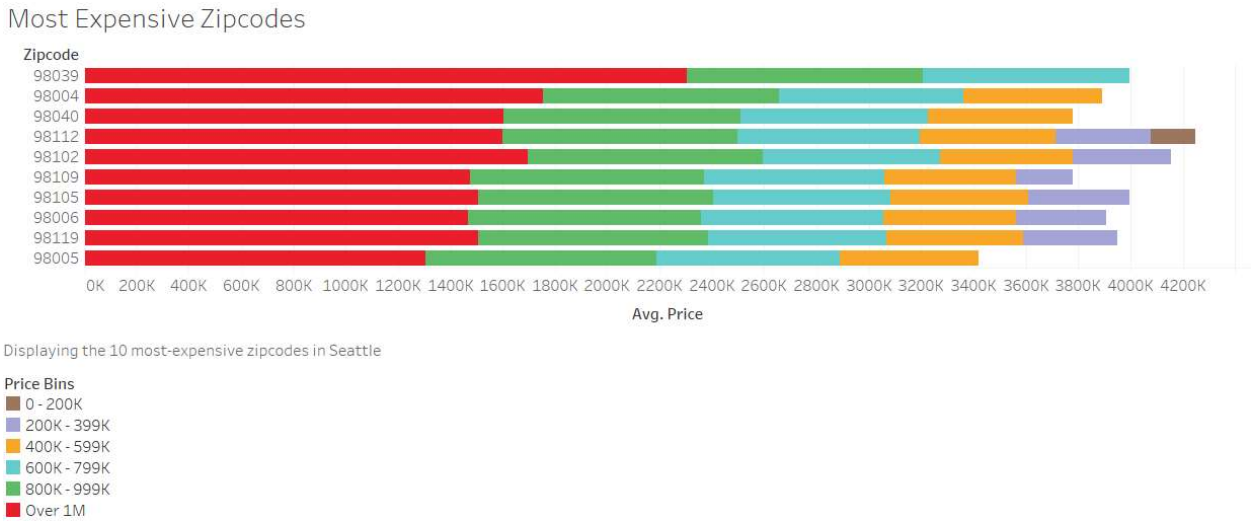
Equation: ln(Avg. Price) = 1.21592e-05*Avg. Yard Size + 13.8368
P-value: 0.0038
R-Squared: 0.029

Despite the p-value indicating significance to this formula, the R-squared value indicates that there is very little correlation between yard size and sales price.

* Note: extreme outliers in Yard size (> 100K square feet) have been removed

For initial exploration into what property to purchase, I decided to look into the overall size of the property to see if there's any value in specifically targeting those with a larger outdoor space. Based on the graph shown, there appears to be a slight relationship between the size of a yard and the sale price of the property; however, the R-squared for this model is only 0.029, indicating that there isn't much of a significant relationship. So, for further analysis, yard size will not be a consideration.

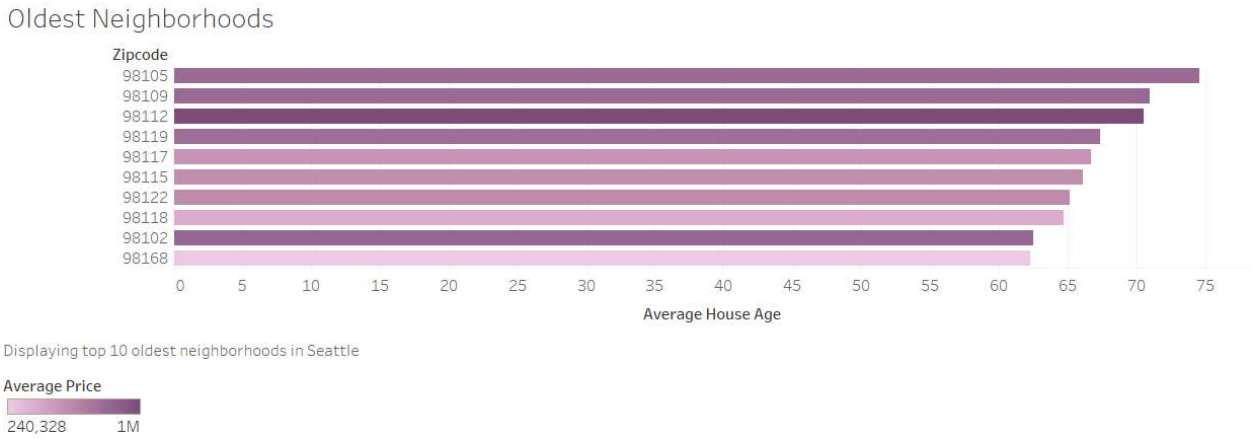
4. Overview of Most Expensive Seattle Zipcodes



For further exploration into the Seattle property market, it may be helpful to get an overview of zipcodes in the area. The chart shown graphs the top-10 most expensive zipcodes in Seattle, and colors provide detail of the specific pricing breakdown in each zipcode. From this chart, we can see that, while these zipcodes contain more expensive properties, there are also many lower-priced properties in the same areas.

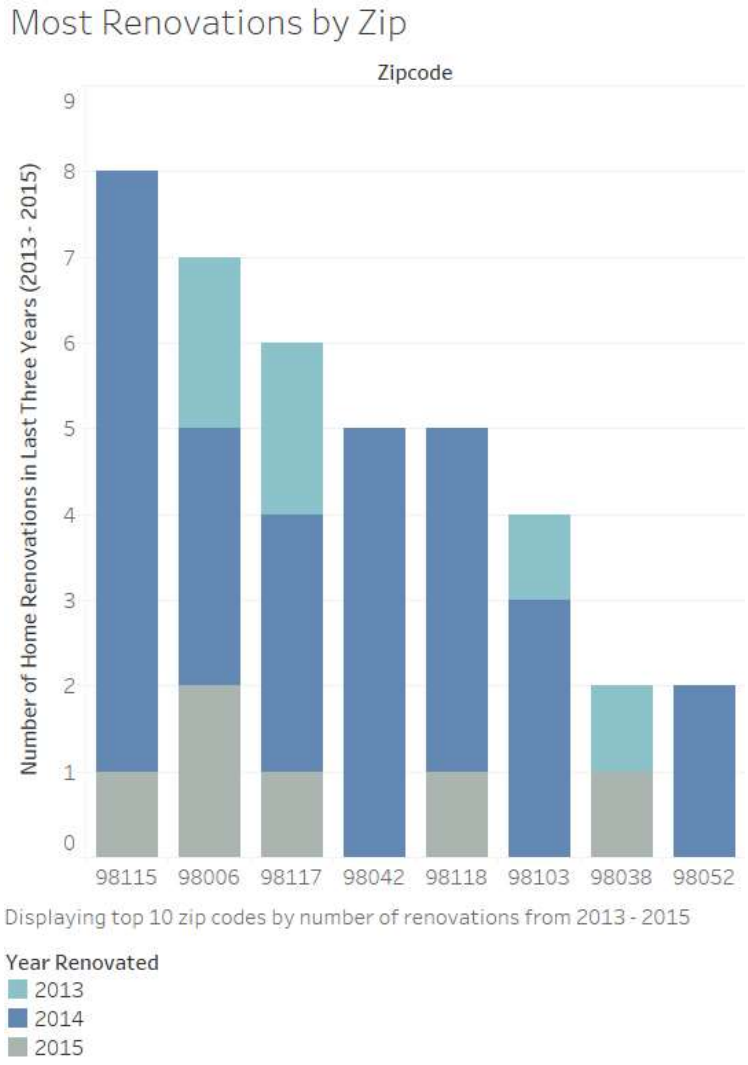
My goal, for an ideal property to acquire, is one that's lower-priced and adjacent to more expensive properties, meaning that it will have excellent opportunity for price appreciation after we complete renovations. While the property that we purchase is unlikely to reside in one of these zipcodes, it's good to see that there's a mix of property values, even in the more-expensive areas!

5. Overview of Oldest Seattle Zipcodes



To further explore the differences between zipcodes in the Seattle region, the chart above shows the 10 neighborhoods with the oldest homes (on average), with a coloring-scale based on the prices. This chart helps to see whether there are any trends in price among older homes, which does not appear to be the case. Therefore, the age of a property will not be a consideration.

6. Zip Codes with Most Renovations



To get an idea of where other property renovators are doing business in the area, the above chart plots the number of renovations in the last three years, by zipcode. It looks like zipcodes 98115 and 98006 were especially popular in the last two years! However, because I believe that we should be bold and take risks in this business, we should keep our search broad, and not just focused within the zipcodes shown here.

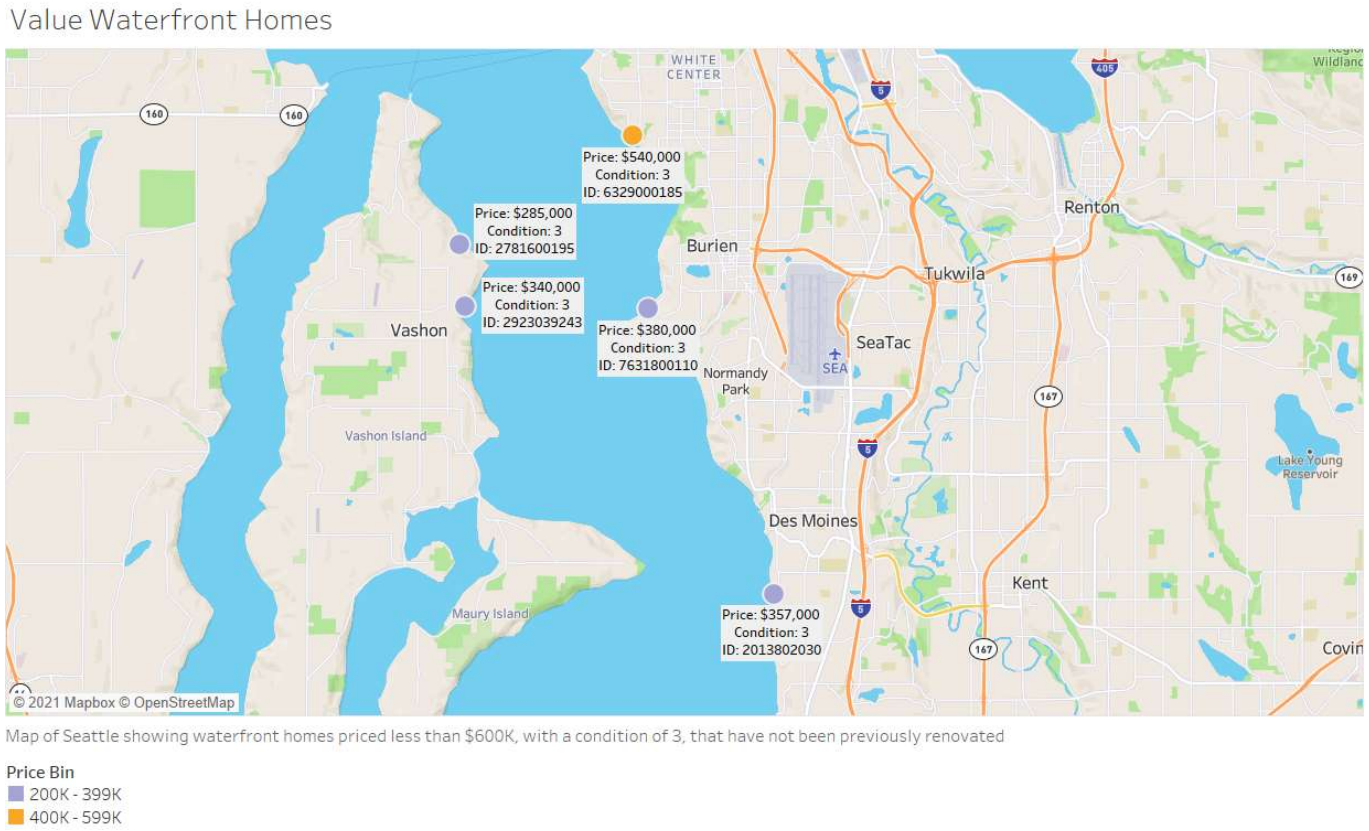
7. Renovations by Property Condition

Renovations by Condition

Renovated?	Condition 1	2	3	4	5
No	29	168	13,295	5,543	1,664
Yes	1	4	736	136	37

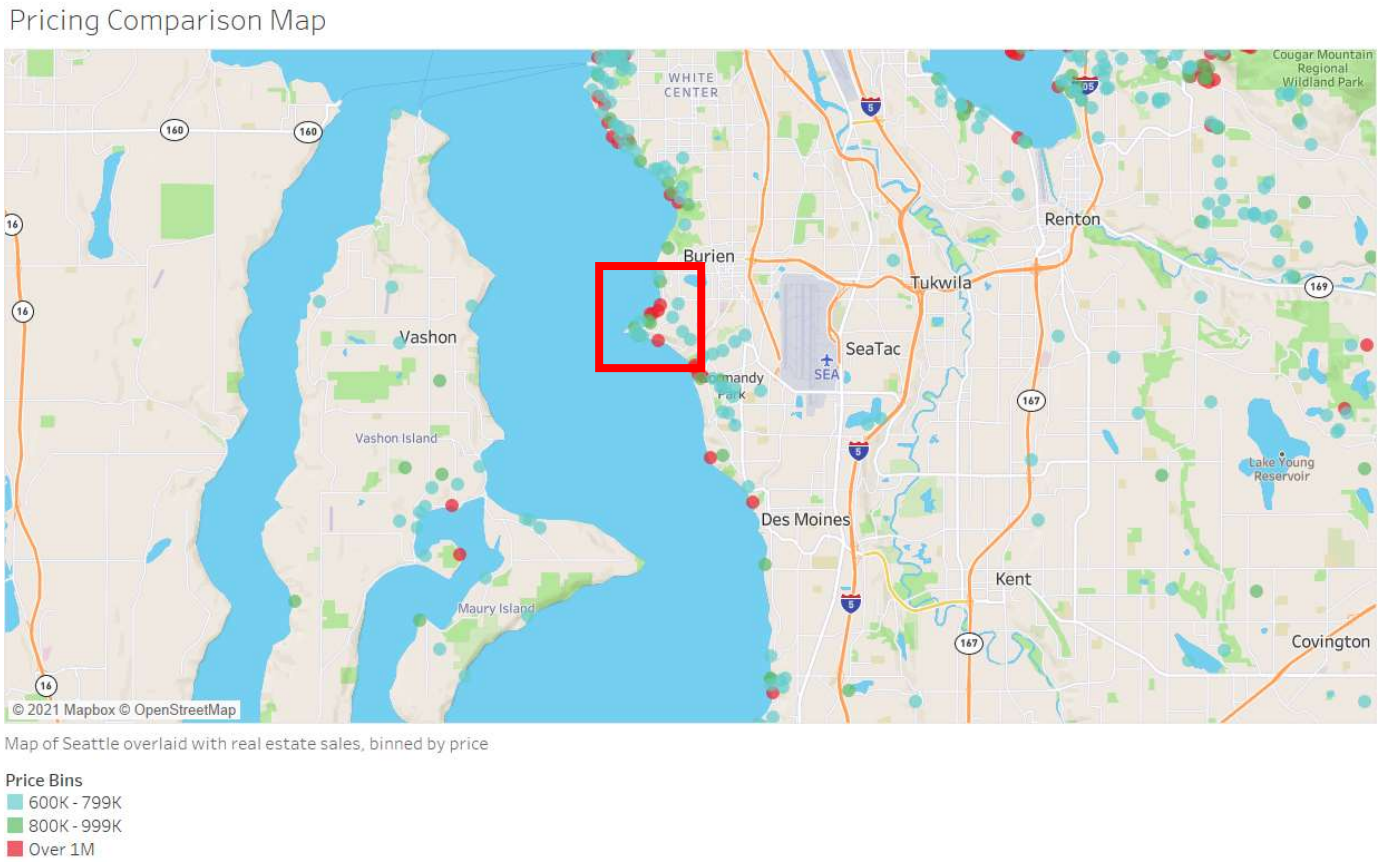
A very important aspect of which property we buy is what condition it's in. We don't want to buy a property that's in great condition (5), because there may not be much value to add to it! And we also don't want to buy a property that's in terrible condition (1) because the cost of excessive repairs may cut into profits. The table above shows the number of homes that have not been and have been renovated, grouped by condition. Here we can see that the overwhelming majority of property renovations were with properties in the condition 3 category. And likewise, for unrenovated homes the overwhelming majority are in condition 3. This shows that there is a significant inventory of potential properties in this area for us to purchase, renovate, and sell for a profit! And further, the scope of this search will be narrowed to properties with condition of 3.

8. Map of Value Waterfront Homes



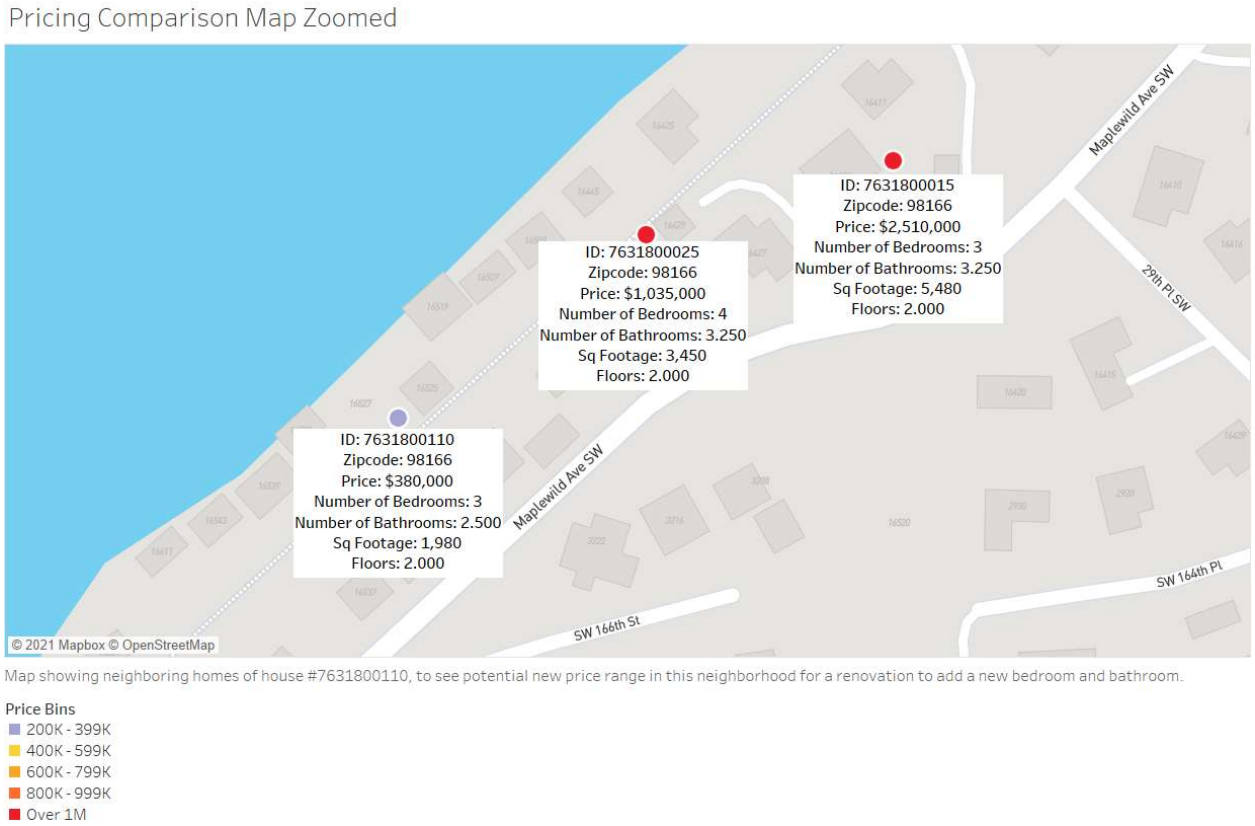
In addition to properties with a condition of 3, I believe that our first acquisition should be a property with an impressive backdrop. And for that reason, I believe that we should also focus only on waterfront properties. The above map shows the narrowed selection of homes that meet the criteria, while also being below $600K (which should allow us a reasonable budget to complete renovation work).

9. Pricing Comparison Map



To further assist with selection of a property, the above map displays the same region as visualization #8, but this time only showing properties above our $600K purchase budget. This gives a good overview of which areas have higher priced properties (in particular, those over $1 million). By comparing between visualization #8 and this map, it looks like property #7631800110 is located within the area highlighted with a red box, an area that also contains numerous properties valued over $1M.

10. Neighborhood Comparison

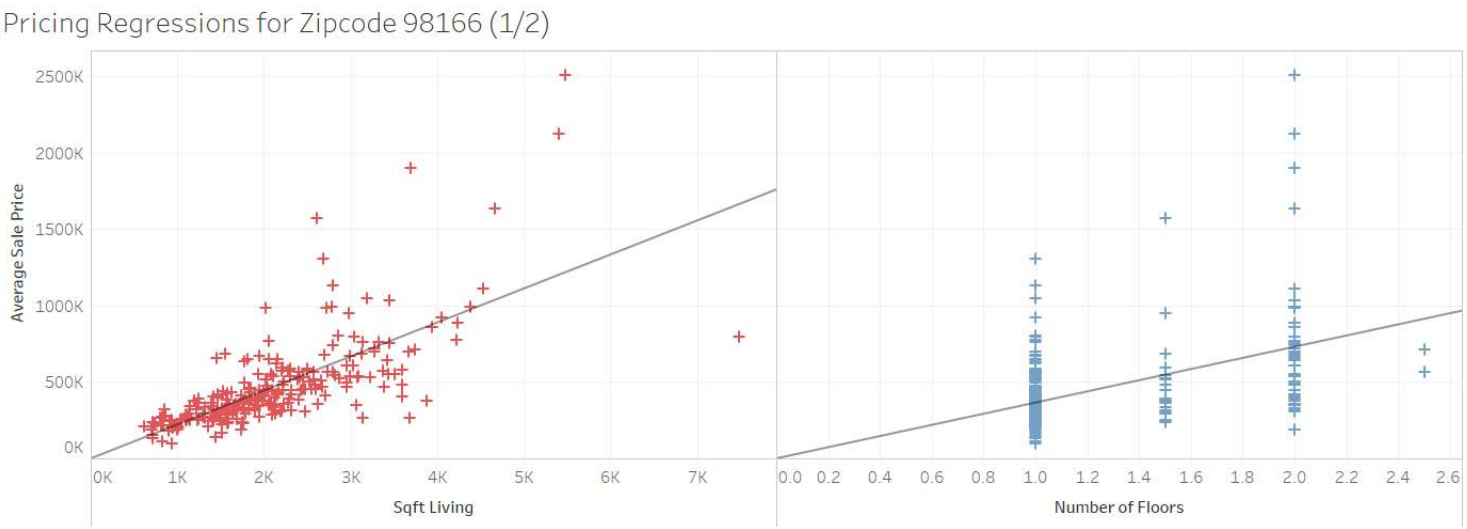


This map shows the zoomed-view of the area where property #7631800110 is located. And what this map shows in particular, is that it is located near to some $1M+ homes just down the street! Therefore, I believe that this is the property that we should focus on purchasing and renovating!

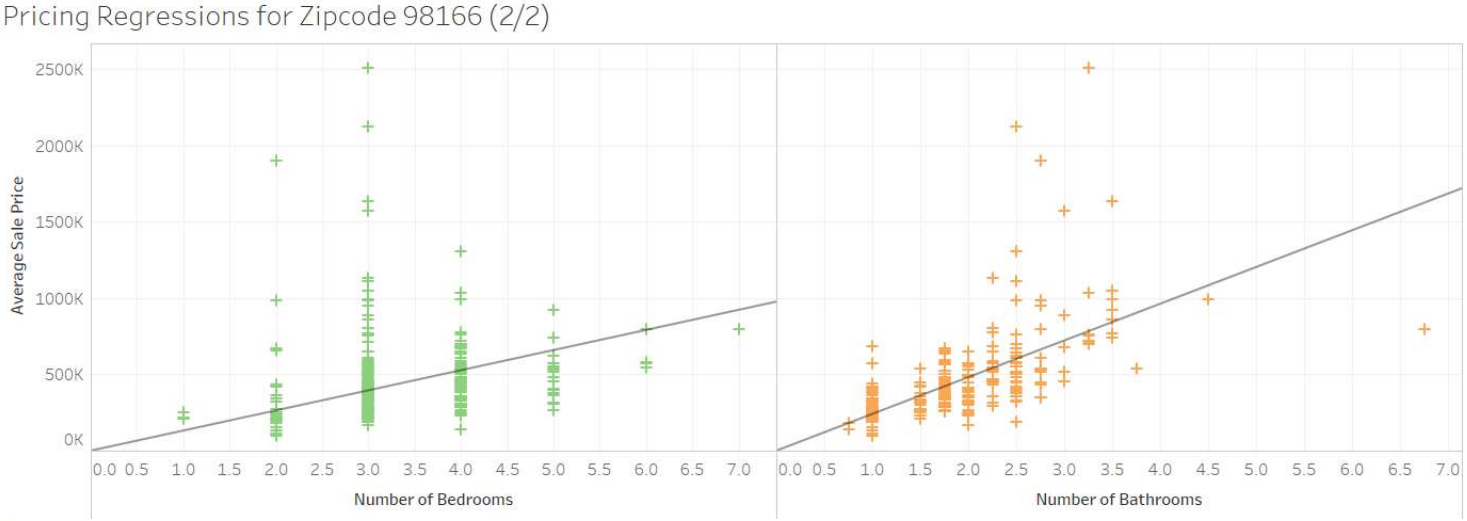
11. Google Earth View

Shown above is a satellite view from Google Earth of property #7631800110. It appears to have great access to the beach, and with scenic views of the bay. After some renovation work, this property would be a wonderful showpiece for our business! I believe that we could attract many potential investors by making a bold statement with a property such as this one!

12. Price Analysis for Potential Property



Average sales price with Square Footage and Number of Floors in Zipcode 98166
Equations (P-value < 0.0001 for all):
Square Footage: Sale Price = 222.367 * Square Footage (R-Squared: 0.86)
Number of Floors: Sale Price = 365489 * Number of Floors (R-Squared: 0.76)



Average sales price with Number of Bedrooms and Number of Bathrooms for Zipcode 98166
Equations (P-value < 0.0001 for all):
Number of Bedrooms: Sale Price = 131897* Number of Bedrooms (R-Squared: 0.69)
Number of Bathrooms: Sale Price = 240816 * Number of Bathrooms (R-Squared: 0.81)

The graphs on the prior page show regressions on price with square footage, number of floors, number of bedrooms, and number of bathrooms, specifically for zipcode 98166 where property #7631800110 is located. Based on the R-squared values from the fitted equations, it appears that the highest-likelihood for a good return on investment would be adding another bathroom to the property, since that regression has the highest R-squared value at 0.81 (suggesting more correlation with price).

And while it appears that adding an entire floor to the property would be the best investment (because the equation coefficient is 365,489, meaning another floor might add $365K in value), it does not seem like a good option. That is primarily because property #7631800110 contains 2 floors, and there do not appear to be many data points on the graph past 2 floors, so I would not trust the predictive accuracy of the equation for adding a 3rd floor.

By purchasing property #7631800110 and renovating to add a bathroom (increasing from 2.5 to 3.5), I believe that we would be able to generate approximately $240K in value. So as long as we can stay below budget, I think this property would be perfect to get started with our renovation business. And if the results turn out as I imagine, I believe that, in addition to the profits gained from adding value to this property, we will gain the attention of interested investors who will help us to grow our business in the future!