King County, WA Housing Affordability Study
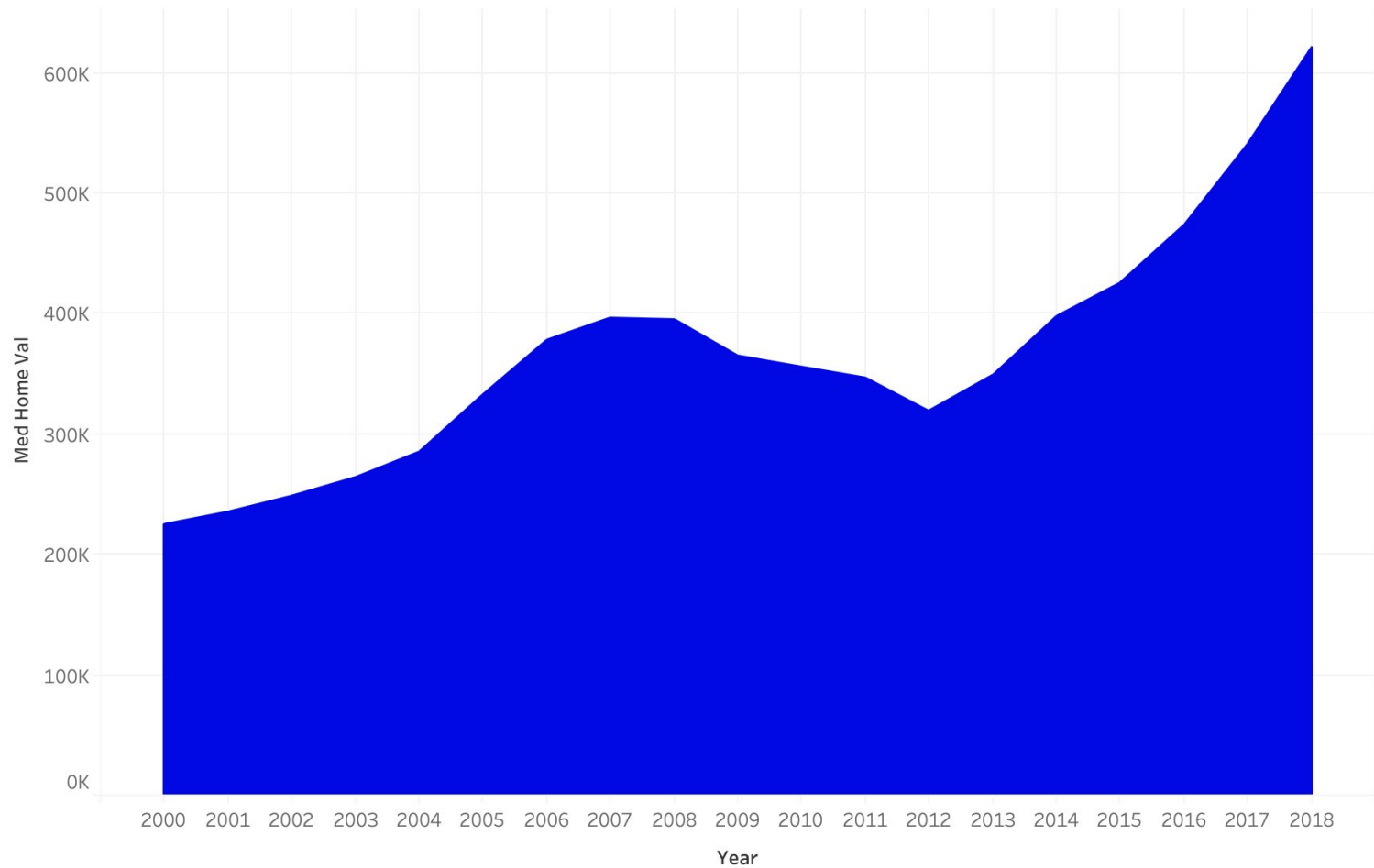
March 13, 2020

The Problem

From 2000 to 2020, the median home value in King County, WA increased by approximately 189%.

King County, WA Median Home Values

The plot of sum of Med Home Val for Year.

Aren't high home values good?

Yes:

- Higher tax revenue for the city
- Good investment for homeowners as they age
- Landlords more likely to remodel units

And no:

- Approximately 12,500 people are homeless per night in King County
- Middle and lower income residents are priced out
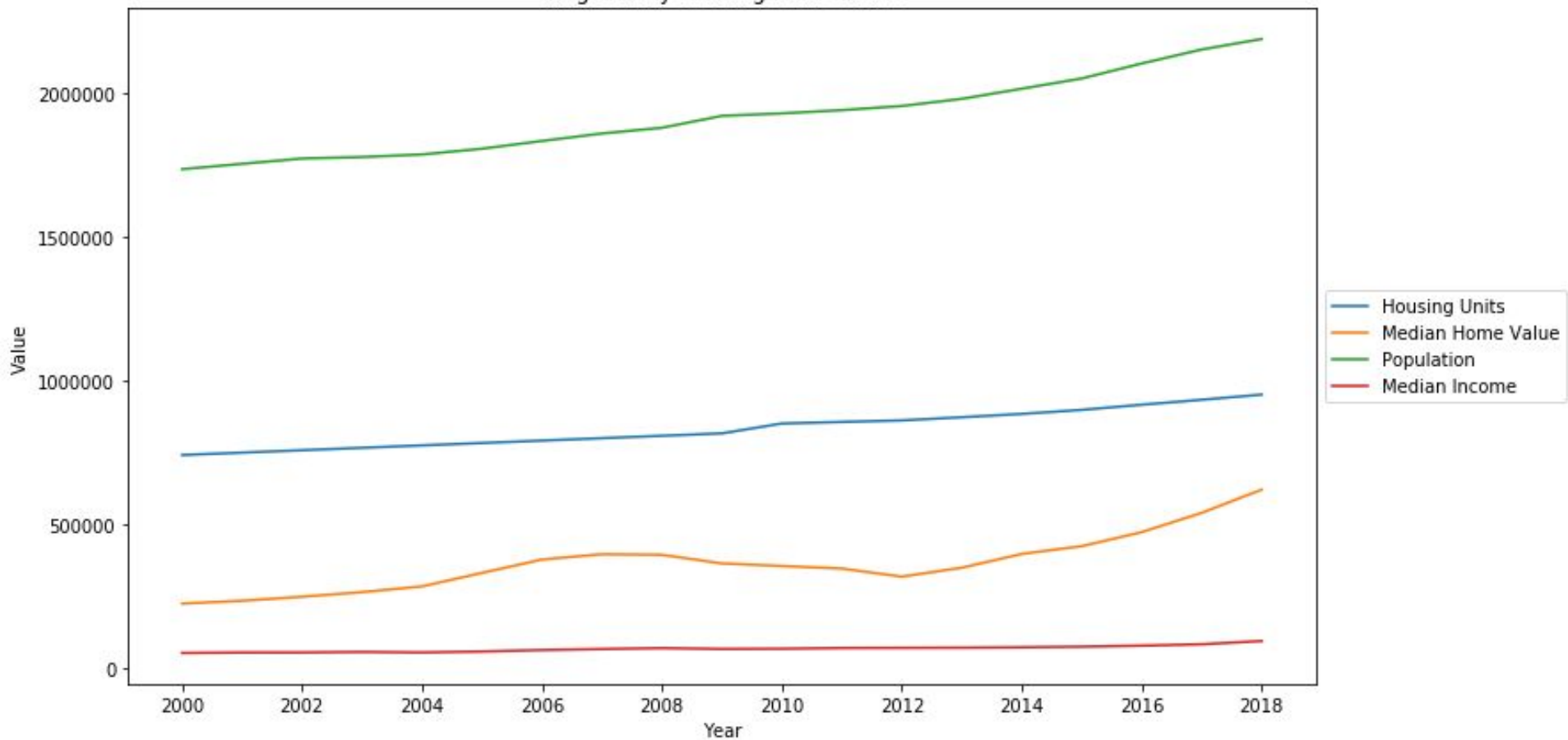- Higher percentage of income goes to housing

What's the Cause?

This study focused on the following factors:

- Population
- Number of Housing Units
- Median Household Income
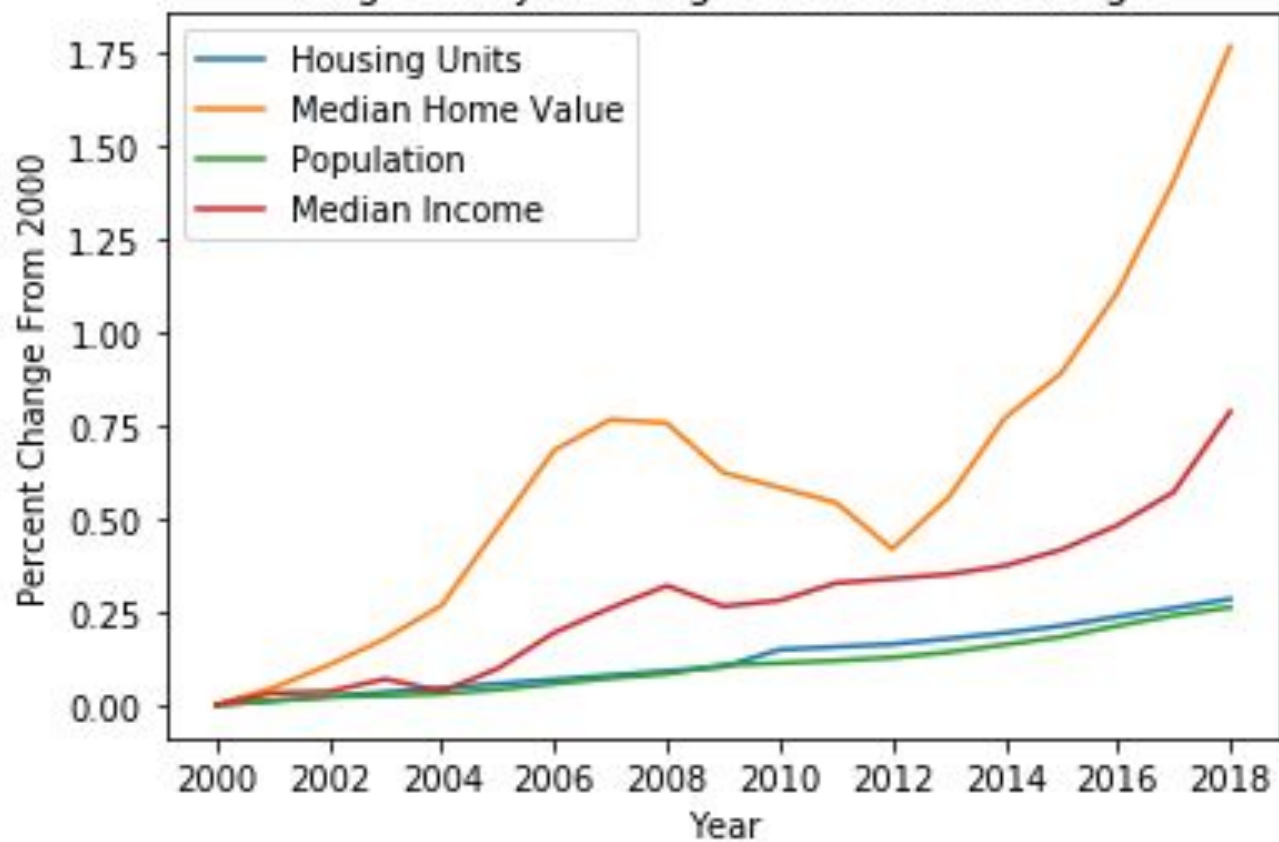
King County Housing Data Values

What's the Cause?

- Raw numbers show large increases in median home value similar to population
- There is a somewhat constant increase in housing units.
- Median Household Income doesn't seem to bump as much as other values

King County Housing Data Percent Change

Percent Change Shows a Different Story

- Median household income correlates much more closely with median house value when comparing percent change from 2000
- Housing units have actually slightly outpaced population growth as a percentage increase from 2000, though it's catching up in later years

What do we believe?

Median Home Value Correlations

	med_home_val
housing_units	0.87
population	0.9
med_income	0.94
med_home_val	1
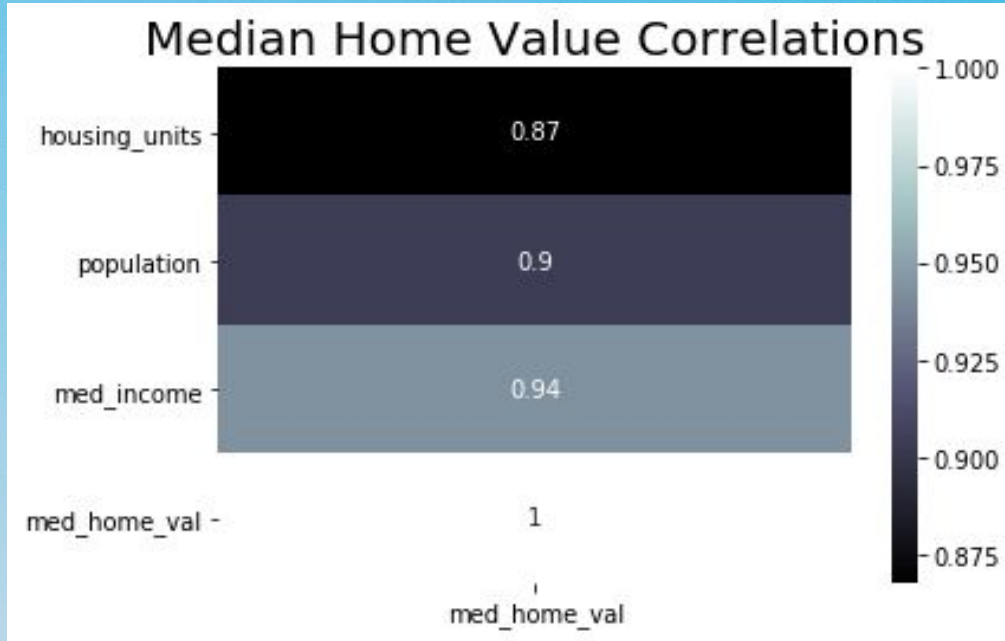
Models

First model: Linear Regression

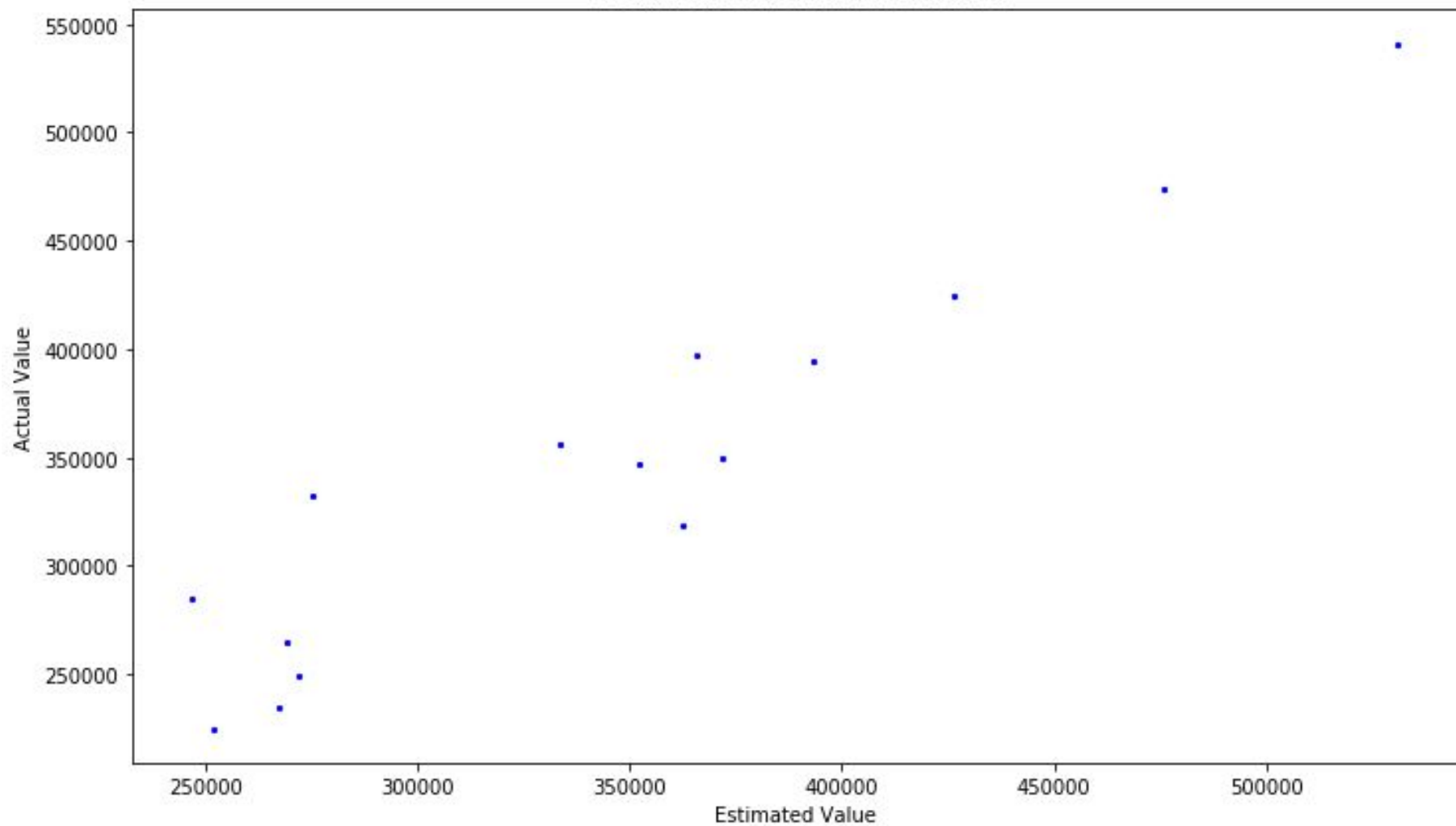Scaled and Unscaled returned essentially identical results

Results:
Train: .904
Test: .898

Actual Values Vs Estimated Values

Models

Second model: Logistic Regression

Scaled data, created gridsearch

Results: Not enough input to run a logistic regression
model through cross validation.

Models

Third model: Random Forest

Scaled data, created gridsearch

Results:
N_estimators: 6
Score: .574

Models

Fourth model: PCA

Scaled data, created gridsearch

Results:
n_components = 3
Score: -33.3

Results

Linear Regression was the best model

Relatively small sample size (18 years)

Increase in median household income is the biggest driver in increasing house values

What Now?

Decrease median household income?

Decrease population?

Increase housing units?

-WA short by 225k homes over last 15 years

Conclusion

Increase housing supply to get ahead of demand and ultimately increase affordability.

More research to include rental rates

Attempt to discern home ownership rates vs rental rates throughout King County