Spatial & Real Estate Data

Team Reveal Estate
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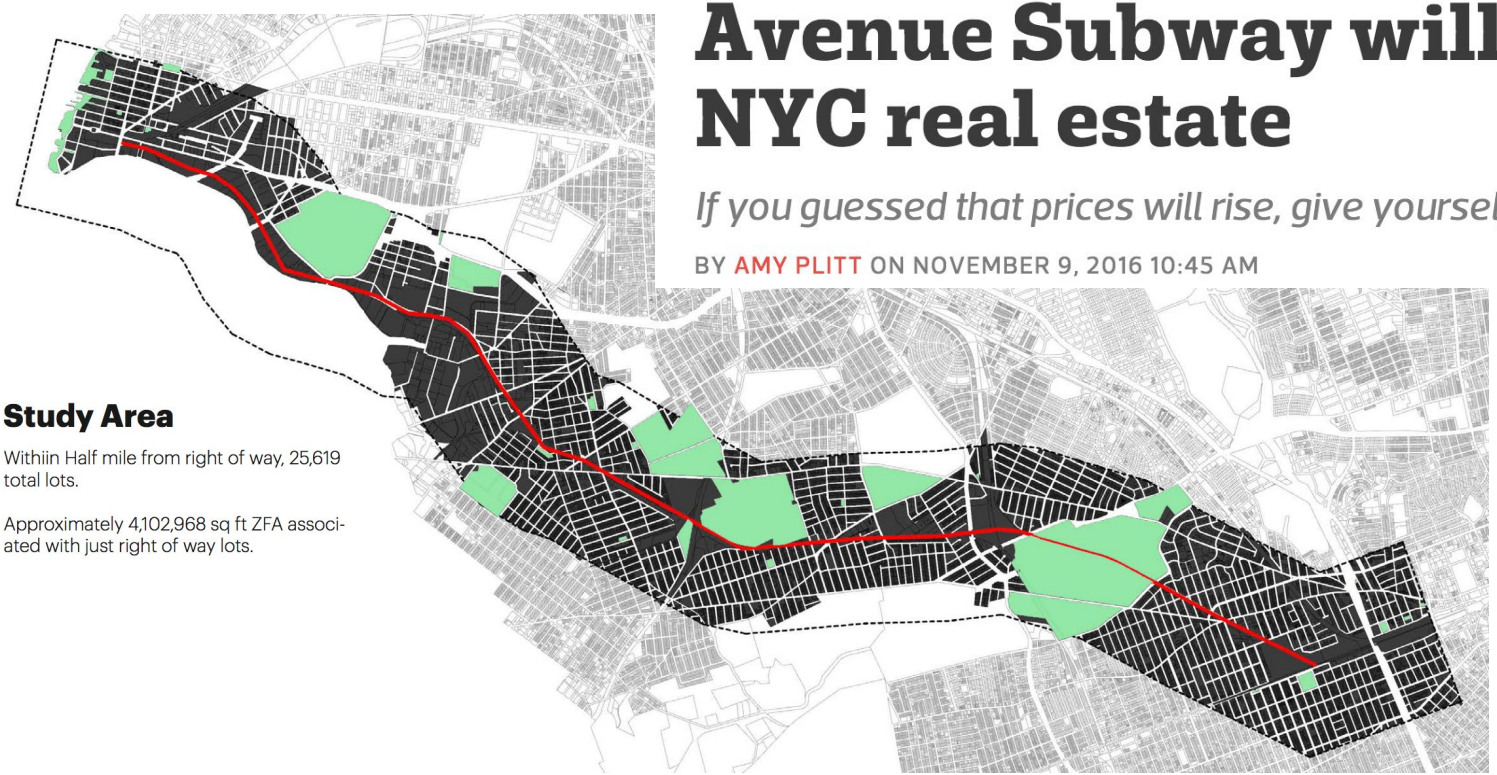
Queens Light Rail

CURBED

Here's how the Second Avenue Subway will affect NYC real estate

If you guessed that prices will rise, give yourself a gold star

BY AMY PLITT ON NOVEMBER 9, 2016 10:45 AM



Update

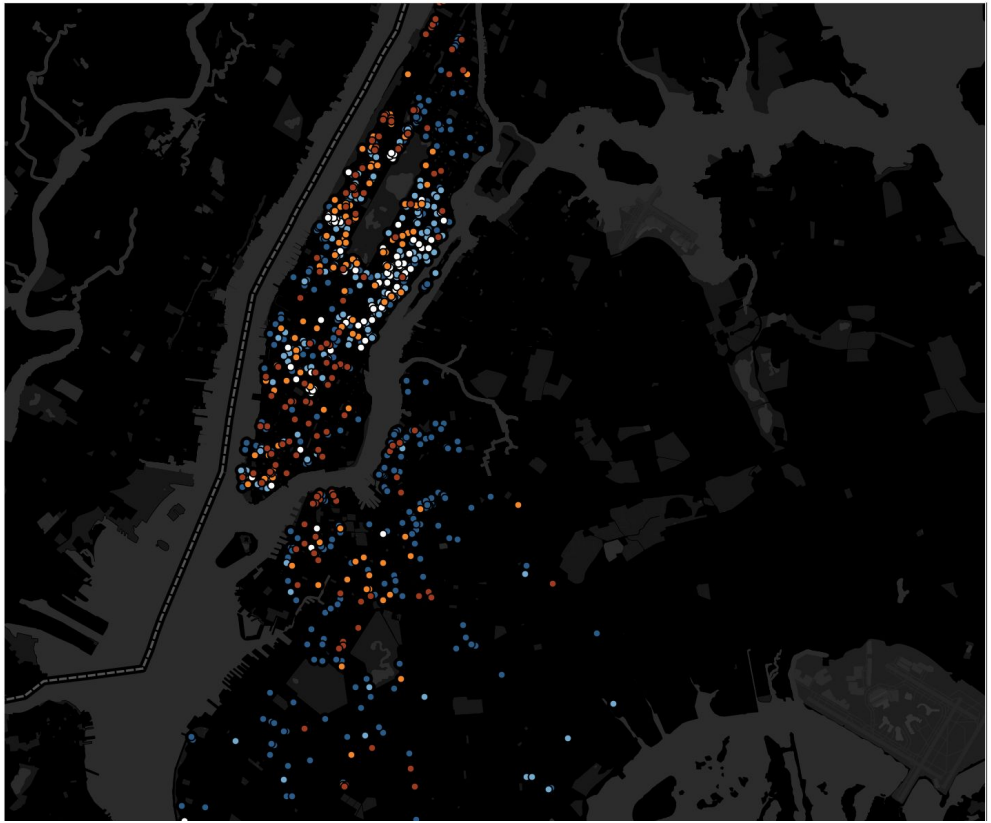
Data Clean

- Drop uninformative features in PLUTO data
- Drop PLUTO instances without latitude and longitude
- Binarize appropriate features, e.g., lots in limited **height districts**, lot in **historic districts**, lot with **landmarks** on property, lot with **basements**, etc.
- Deal with impossible values, e.g., buildings built in 2040
- Create dummy variables: **borough**, **school district**, **building class**, **lot owner type**, etc.

Data Merge

- Distance to **subway**, **PATH**, **tree census**, **botanical gardens**, **libraries**, **colleges and universities**, **outdoor cafes**, and **day cares**

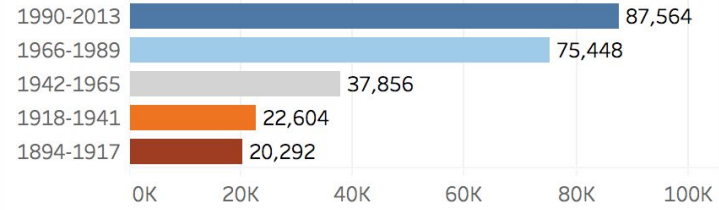
Low Price ($1 - $5 per sqft)



Year Built

1900.0 2015.0

Number of Low Prices Per Year Built



Issues & Solutions

Issues

- Many duplicate sales records for same lot in single year
- Anomalies in target variable price per sqft
- Many price per sqft < **$5**

Solutions:

- Average sales records over each year
- Filter out rows where price per sqft < **$5**
- Model MSE decreases by **> 3,000**

Preliminary Results

- Linear Regression and Random Forest models with data from:
  - PLUTO
  - Dept. of Finance & Sales
  - Subways

Model Setup		MSE	Accuracy
Linear Regression	All records	4976.12	5.43%
	Price Per Sqft > 0	3867.97	8.56%
	Price Per Sqft >= 5	3076.29	27.64%
Random Forest	All records	3835.71	13.82%
	Price Per Sqft > 0	1359.81	64.46%
	Price Per Sqft >= 5	730.32	69.66%

Next Steps

- Add more data sources (NYC Open Data)
- Determine optimal evaluation metric for comparing performance
- Iterate over various regression model families to hone in on best model
- Predict real estate values in affected lots with and without new light rail
    - Causal inference estimation methods (Athey & Imbens)