# Extracting Building Values by Zip Code

Amit, Colton, Meggan

# Agenda

Problem Statement

Data Collection

Exploratory Analysis

Our Simple API

Conclusions

# Problem Statement

During a disaster, it is important to model and estimate the potential or forecasted effect of the event, including the projected/forecasted damage.

Existing indicators of forecasted damage include number of structures within the affected area, number of people in the area, number of households, demographics of the impacted population, etc. This project will add an additional indicator: ***the value of the properties in the affected area.***

# Building an API

# Gather the Data

- ATTOM’s Property Data API
  - “Consolidates property-centric tax, deed, mortgage and foreclosure data with enhanced neighborhood-centric schools, crime, and other community data — all available nationwide.”

https://www.attomdata.com/solutions/property-data-api/

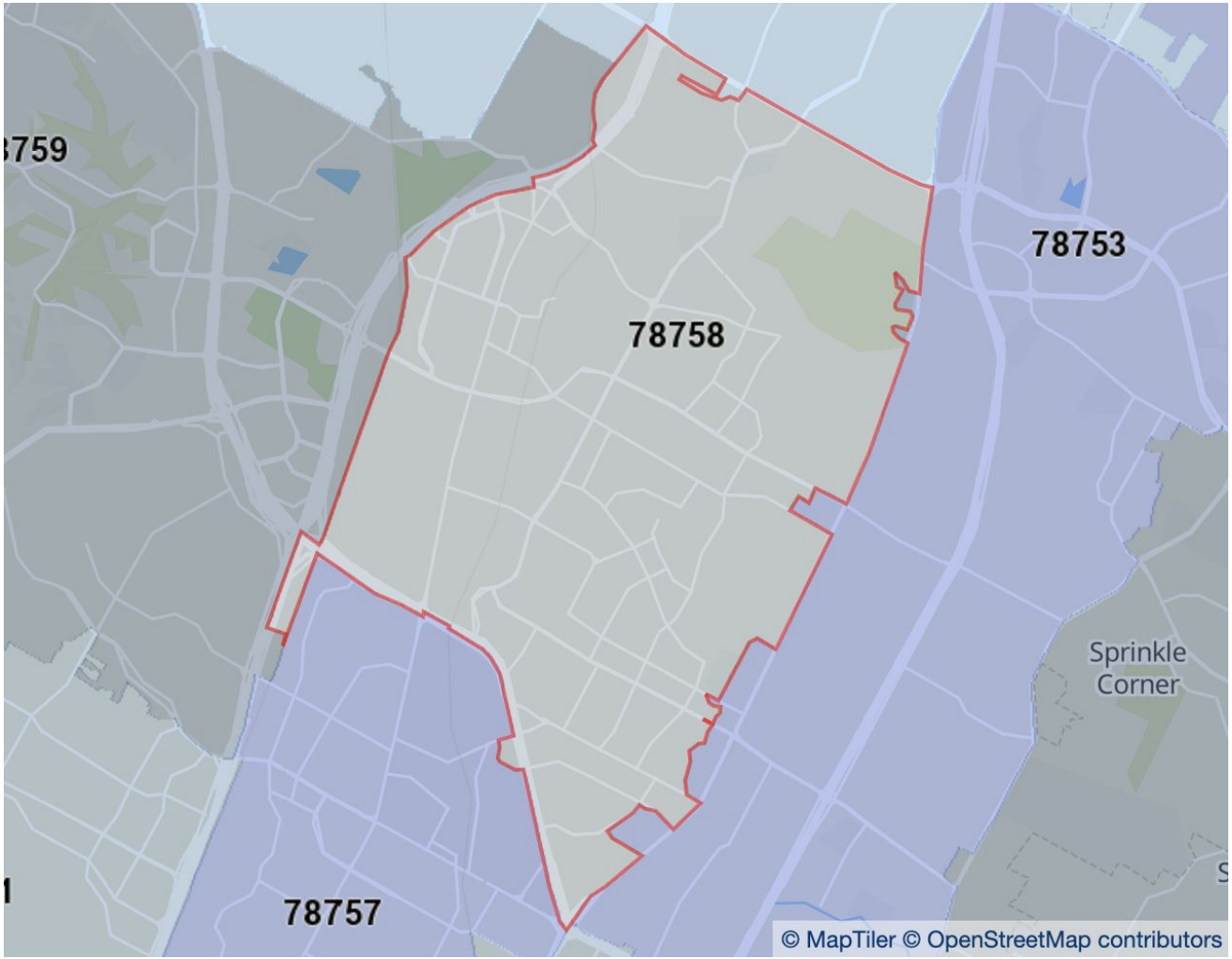
# Data Dictionary

| | |
|---|---|
| **calcimprvalue** | Derived Assessed Value of the improvement(s) used to calculate property tax |
| **calclandvalue** | Derived Assessed Value of the land used to calculate property tax |
| **calcttlvalue** | Derived Total Value used to calculate property tax |
| **proptype** | A specific property classification such as "Detached Single Family" |
| **postal1** | For the U.S. this is the 5-digit ZIP Code |

https://api.developer.attomdata.com/docs

# Let’s explore a Zip Code…

# 78758


759
78758
78753
Sprinkle
Corner
78757
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# Input a Zip Code, Year, Month, Day

➔ Returns Assessment Details

“There are 9264 properties found in the 78758 zip code for the year preceding 2/21/2020.”

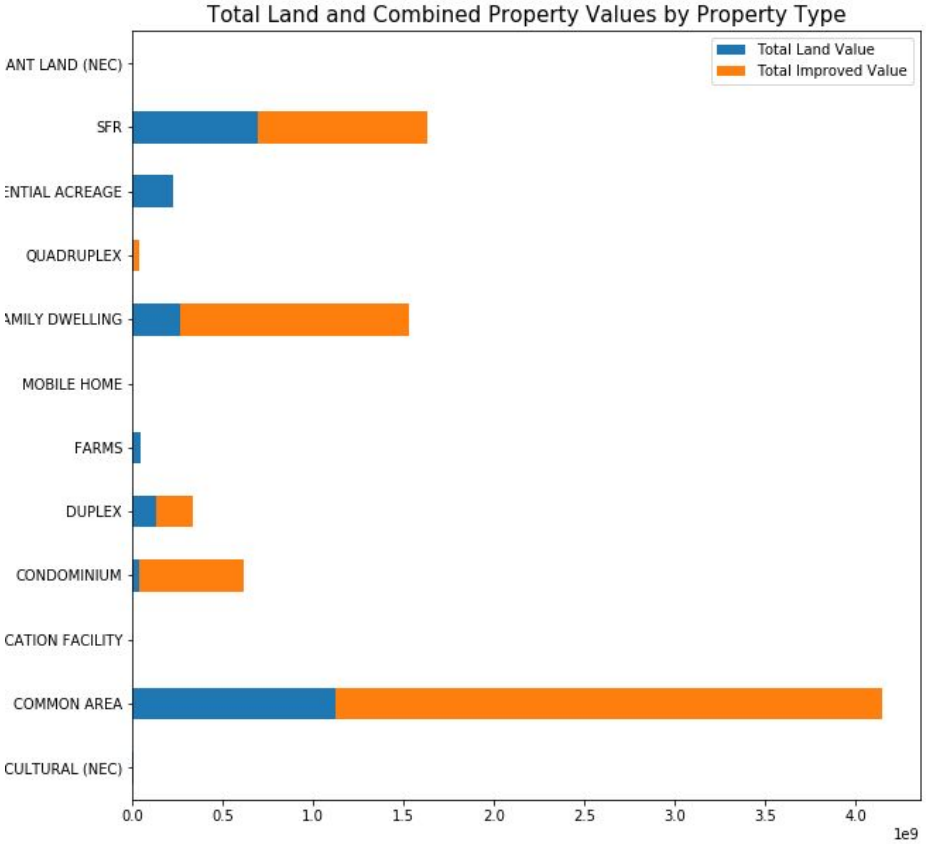
# Aggregate Data

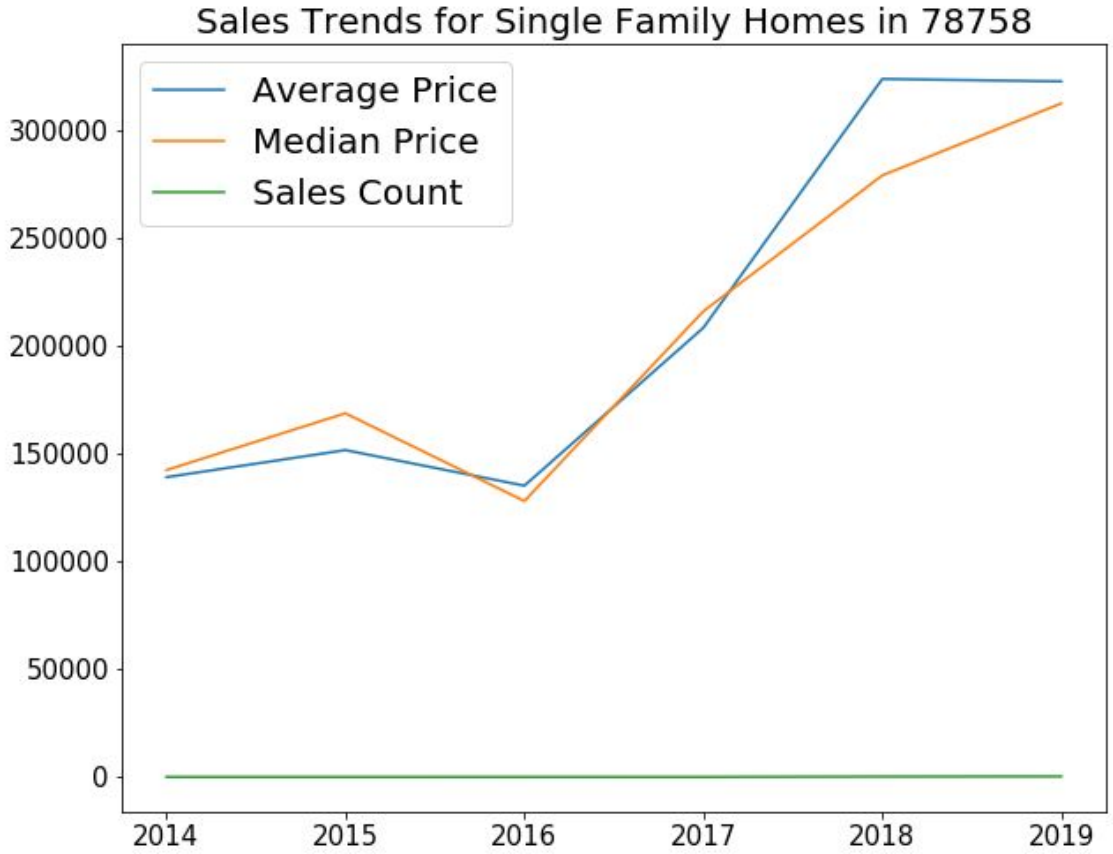
| | Land Value | Improved Value On the Land | Total Property Value |
|---|---|---|---|
| **Mean Property Value** | $275,209.60 | $651,732.34 | $926,941.94 |
| **Median Property Value** | $125,000.00 | $170,138.50 | $288,392.50 |
| **Minimum Property Value** | $0.00 | $0.00 | $11.00 |
| **Maximum Property Value** | $150,478,020.00 | $233,220,744.00 | $305,000,000.00 |
| **TOTAL PROPERTIES VALUE** | $2,549,541,774.00 | $6,037,648,400.00 | $8,587,190,174.00 |

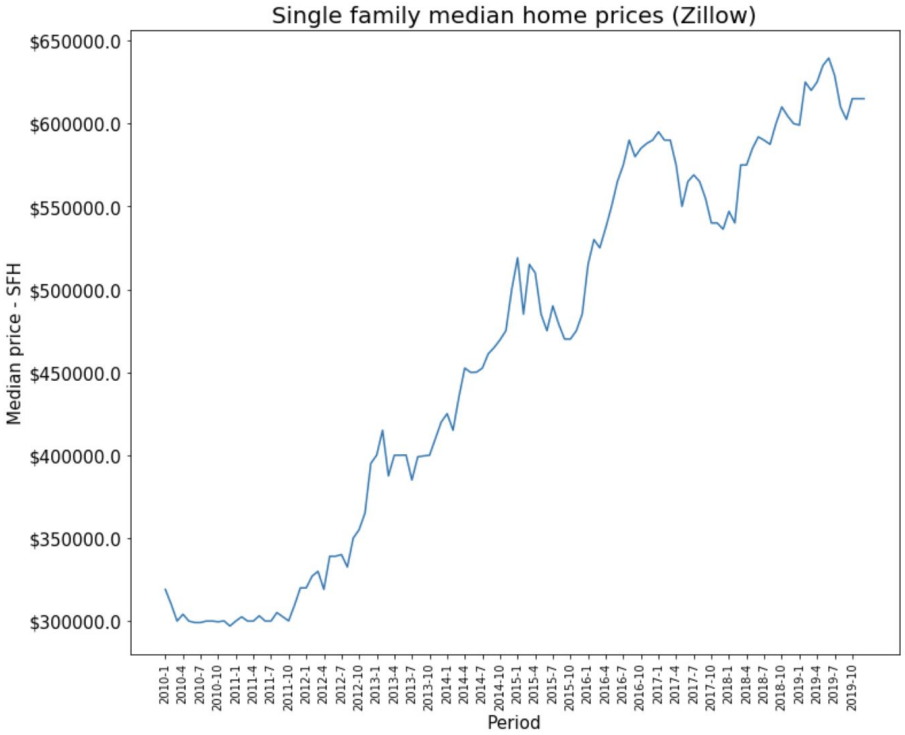
| property_type | count | mean | std | median_val | min_val | max_val | max_total |
|---|---|---|---|---|---|---|---|
| AGRICULTURAL (NEC) | 6 | $751,139.50 | $939,030.77 | $405,761.00 | $89,754.00 | $2,585,424.00 | $4,506,837.00 |
| COMMON AREA | 751 | $1,497,625.60 | $4,111,666.59 | $601,125.00 | $0.00 | $71,779,256.00 | $1,124,716,829.00 |
| COMMUNICATION FACILITY | 1 | $61,143.00 | $nan | $61,143.00 | $61,143.00 | $61,143.00 | $61,143.00 |
| CONDOMINIUM | 1581 | $25,011.63 | $236,795.72 | $382.00 | $39.00 | $7,778,264.00 | $39,543,389.00 |
| DUPLEX | 1084 | $125,181.39 | $34,693.00 | $125,000.00 | $41,563.00 | $1,216,625.00 | $135,696,626.00 |
| FARMS | 22 | $2,047,794.95 | $4,654,726.79 | $528,418.50 | $555.00 | $21,928,110.00 | $45,051,489.00 |
| MOBILE HOME | 65 | $16,481.15 | $123,197.65 | $0.00 | $0.00 | $991,275.00 | $1,071,275.00 |
| MULTI FAMILY DWELLING | 82 | $3,237,307.96 | $3,977,003.69 | $1,559,211.00 | $70,803.00 | $14,378,067.00 | $265,459,253.00 |
| QUADRUPLEX | 93 | $123,407.26 | $13,362.73 | $125,000.00 | $1,250.00 | $137,500.00 | $11,476,875.00 |
| RESIDENTIAL ACREAGE | 147 | $1,526,348.49 | $12,411,231.54 | $130,000.00 | $11.00 | $150,478,020.00 | $224,373,228.00 |
| SFR | 5431 | $128,150.34 | $67,996.61 | $125,000.00 | $1,000.00 | $4,653,944.00 | $695,984,495.00 |
| VACANT LAND (NEC) | 1 | $1,600,335.00 | $nan | $1,600,335.00 | $1,600,335.00 | $1,600,335.00 | $1,600,335.00 |

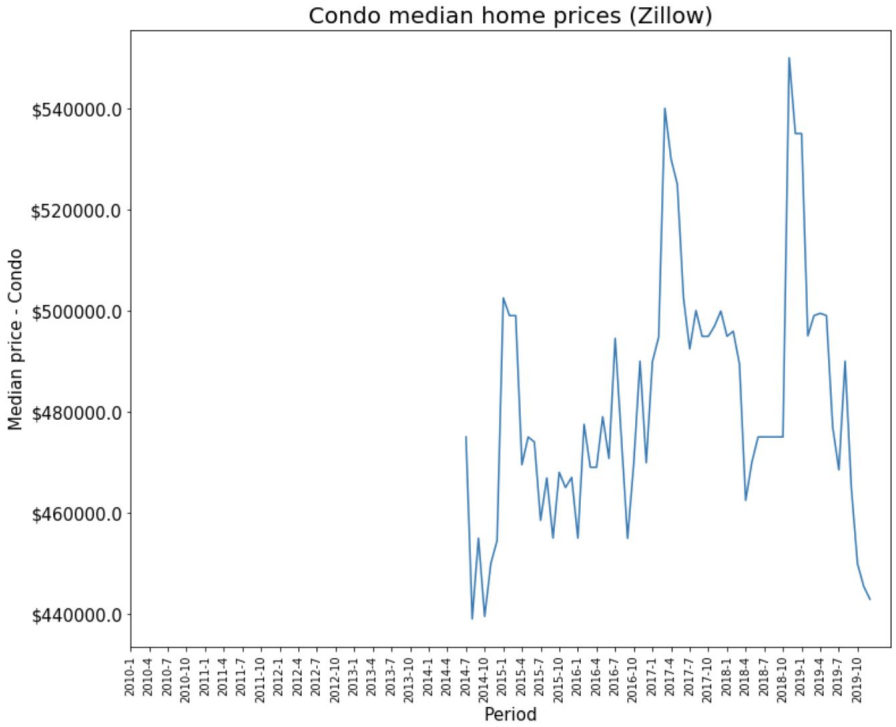
| property_type | count | mean | std | median_val | min_val | max_val | max_total |
|---|---|---|---|---|---|---|---|
| AGRICULTURAL (NEC) | 6 | $751,139.50 | $939,030.77 | $405,761.00 | $89,754.00 | $2,585,424.00 | $4,506,837.00 |
| COMMON AREA | 751 | $5,525,322.29 | $18,108,904.52 | $1,462,937.00 | $38.00 | $305,000,000.00 | $4,149,517,038.00 |
| COMMUNICATION FACILITY | 1 | $63,643.00 | $nan | $63,643.00 | $63,643.00 | $63,643.00 | $63,643.00 |
| CONDOMINIUM | 1581 | $389,213.64 | $3,801,196.41 | $170,833.00 | $169.00 | $124,640,000.00 | $615,346,770.00 |
| DUPLEX | 1084 | $312,014.11 | $42,405.96 | $311,473.50 | $120,755.00 | $1,217,625.00 | $338,223,292.00 |
| FARMS | 22 | $2,050,536.09 | $4,653,784.22 | $528,418.50 | $555.00 | $21,928,110.00 | $45,111,794.00 |
| MOBILE HOME | 65 | $20,635.78 | $125,671.97 | $3,146.00 | $393.00 | $1,014,648.00 | $1,341,326.00 |
| MULTI FAMILY DWELLING | 82 | $18,693,156.59 | $25,049,117.41 | $7,017,614.50 | $70,803.00 | $129,390,000.00 | $1,532,838,840.00 |
| QUADRUPLEX | 93 | $436,649.22 | $74,562.10 | $450,300.00 | $1,778.00 | $580,077.00 | $40,608,377.00 |
| RESIDENTIAL ACREAGE | 147 | $1,530,478.01 | $12,410,773.28 | $138,044.00 | $11.00 | $150,478,020.00 | $224,980,268.00 |
| SFR | 5431 | $300,685.74 | $89,037.42 | $290,482.00 | $1,000.00 | $4,883,630.00 | $1,633,024,228.00 |
| VACANT LAND (NEC) | 1 | $1,627,761.00 | $nan | $1,627,761.00 | $1,627,761.00 | $1,627,761.00 | $1,627,761.00 |

Comparing Value Add on the Land vs Total Property Value by Type


Total Land and Combined Property Values by Property Type
Total Land Value
Total Improved Value
ANT LAND (NEC)
SFR
ENTIAL ACREAGE
QUADRUPLEX
AMILY DWELLING
MOBILE HOME
FARMS
DUPLEX
CONDOMINIUM
CATION FACILITY
COMMON AREA
CULTURAL (NEC)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
1e9


Sales Trends for Single Family Homes in 78758
Average Price
Median Price
Sales Count
300000
250000
200000
150000
100000
50000
0
2014
2015
2016
2017
2018
2019




Zillow Sales Trends

# Our API: a walk through

# Conclusions & Recommendations

- This property value data may be combined with many other factors in order to build a prediction model for the direct damages [1] of a natural disaster in a given area
- Other factors include but are not limited to the type and severity of the storm, types of industries in the area [2], and dynamics of the population demographics [3]
- Calculating the economic impact of a disaster would include many indirect costs, such as wage loss and decreased market supply

[1] How a Disaster's Economic Impacts Are Calculated, https://www.theatlantic.com/business/archive/2017/08/harvey-economic-impacts/538353/
[2] Elco E. Koks & Mark Thissen (2016) A Multiregional Impact Assessment Model for disaster analysis, Economic Systems Research, 28:4, 429-449, DOI: 10.1080/09535314.2016.1232701
[3] Predicting Postdisaster Residential Housing Reconstruction Based on Market Resources, https://ascelibrary.org/doi/pdf/10.1061/%28ASCE%29NH.1527-6996.0000339
[4] W J Wouter Botzen, Olivier Deschenes, Mark Sanders, The Economic Impacts of Natural Disasters: A Review of Models and Empirical Studies, Review of Environmental Economics and Policy, Volume 13, Issue 2, Summer 2019, Pages 167–188, https://doi.org/10.1093/reep/rez004

# Q & A