

# WASHINGTON, DC REAL ESTATE ANALYSIS

04.27.2019



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Data Analyst

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Data Analyst / Visualization

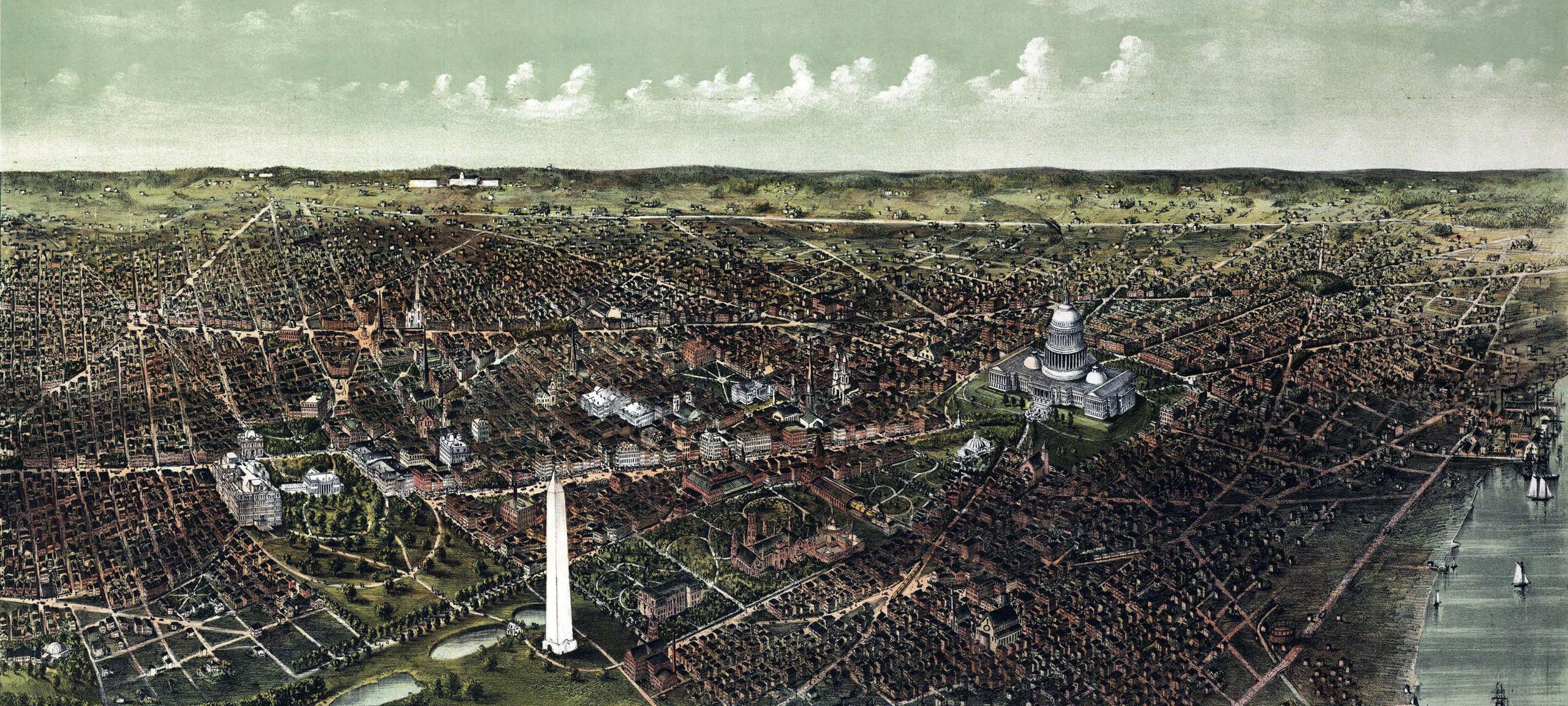
# AGENDA

- 1 INTRODUCTION / METHODOLOGY
- 2 RESULTS
- 3 ADVISEMENT
- 4 LIMITATIONS
- 5 Q&A



# 1

## INTRODUCTION / METHODOLOGY



## Washington, DC - Stats

- ~700,000 residents spread across 68 mi<sup>2</sup>
- 20% growth in population after nearly a half century of decline
- Unprecedented urban development occurring inside and outside of city

Which area(s) of DC hold the highest probability of future Return on Investment (ROI), based off historical data?

## RESIDENTIAL DATA ANALYSIS



+

**kaggle**

User: ChrisC  
[Source Here](#)

**3 & 3**  
dc.gov and US  
Census data  
sets

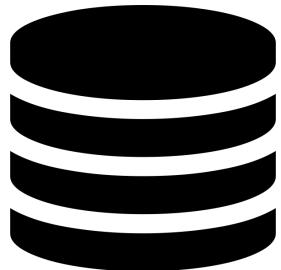
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**76 K**  
qualified  
residential/condo  
sales records

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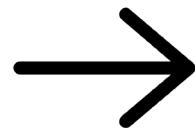
**18**  
years of  
historical data

# OUR PROCESS

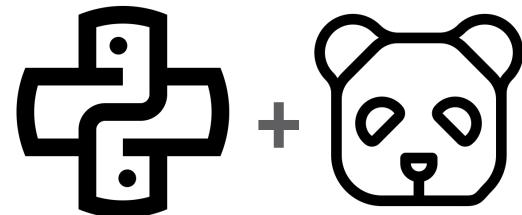


## DATA

DC.gov  
Census (2010)



## CLEANING / ANALYSIS

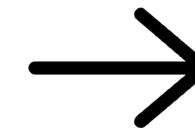


Python  
Pandas



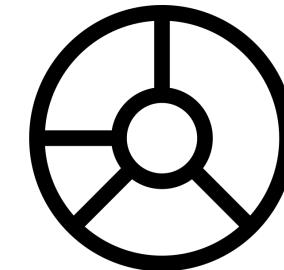
## VARIABLES

Turnover      Total Sales  
Sale Date      Cost / SF



## VISUALIZATION

Matplotlib  
InDesign





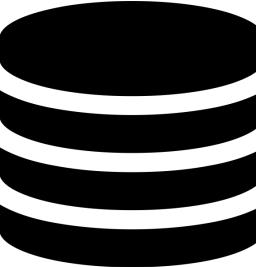
2

RESULTS



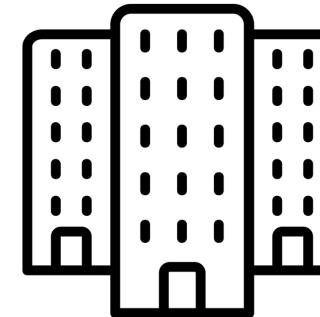
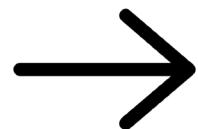
## ANALYSIS - COUNT & COST/SF

**SALE DATA**



n = 158,958 w/ 49 columns

52% Unqualified Sales  
**48% Qualified Sales\***



### HOUSES

n = 45,886

60% of total sales

Average \$356 / SF

### CONDOS

n = 30,347

40% of total sales

Average \$483 / SF

*\*Approved for a home loan*

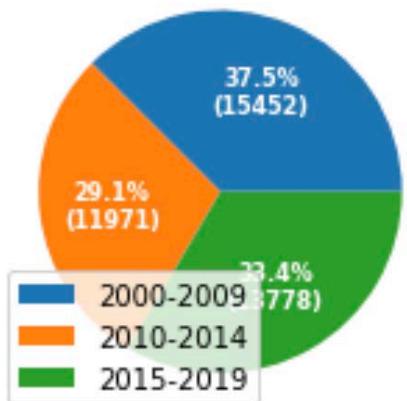
## ANALYSIS - SALES/YEAR

### HOUSES

**x 1.73**

Increase in sales compared to  
previous decade

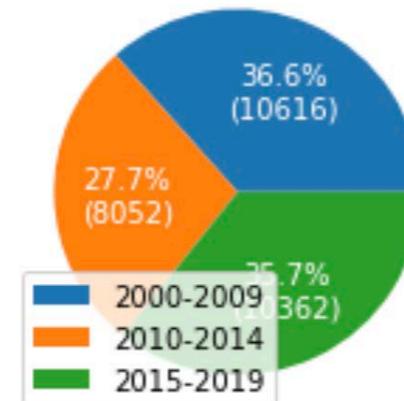
Number of Residential Houses



### CONDOS

**x 1.66**

Number of Residential Condos



## ANALYSIS - SALES

Outcome:	House Price (in hundred-thousands)
	(1)
Gross Building Area (GBA)	0.0056*** (0.00)
Residential Dummy	1.71*** (0.00)
GBA Residential Interaction	-0.0017*** (0.000)
Ward 2 Dummy	1.70*** (0.048)
Ward 3 Dummy	0.32*** (0.053)
Ward 4 Dummy	-1.77*** (0.040)
Ward 5 Dummy	-1.96 (0.043)***
Ward 6 Dummy	-0.20 (.037)***
Ward 7 Dummy	-3.00 (.058)***
Ward 8 Dummy	-3.49 (0.049)***
Constant	-2.38 (0.14)***
Adjusted R <sup>2</sup>	0.56
F-Statistic	3559
N	76,233

Notes: \*10% Significance, \*\*5% Significance, \*\*\*1% Significance. Standard errors in parentheses are robust to heteroscedasticity.

## ANALYSIS - WARD TURNOVER

**8**  
Wards

A map of a city divided into 8 numbered wards (1-8) for analysis of ward turnover. The wards are: 1 (center), 2 (bottom left), 3 (top left), 4 (top center), 5 (top right), 6 (bottom center), 7 (bottom right), and 8 (bottom tip). The map is enclosed in a red border.

**76 K**  
House + Condo  
Sales

## ANALYSIS - WARD TURNOVER

### HIGHEST

Ward 6 - 13,331

Ward 2 - 12,725

Ward 3 - 11,273

Ward 1 - 9,540

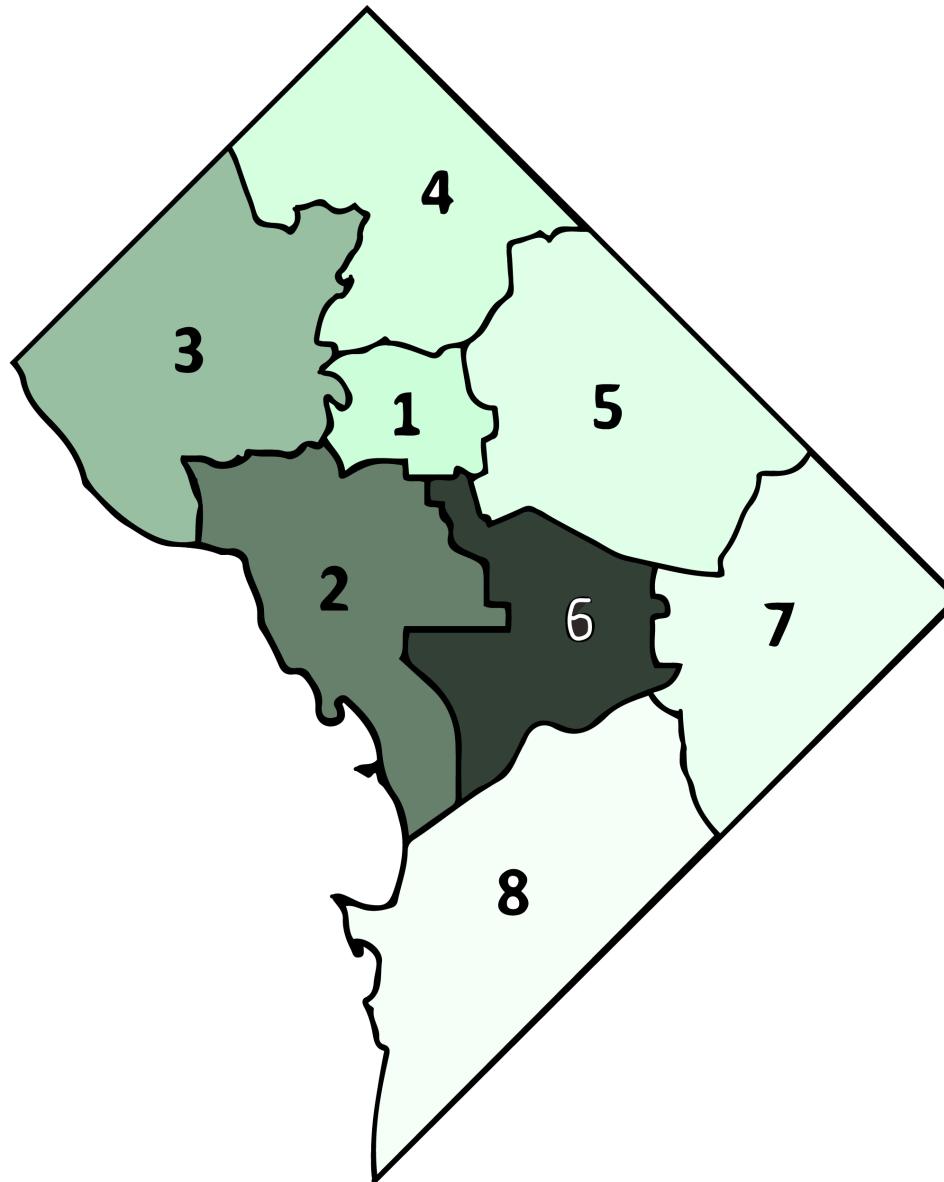
### LOWEST

Ward 8 - 4,144

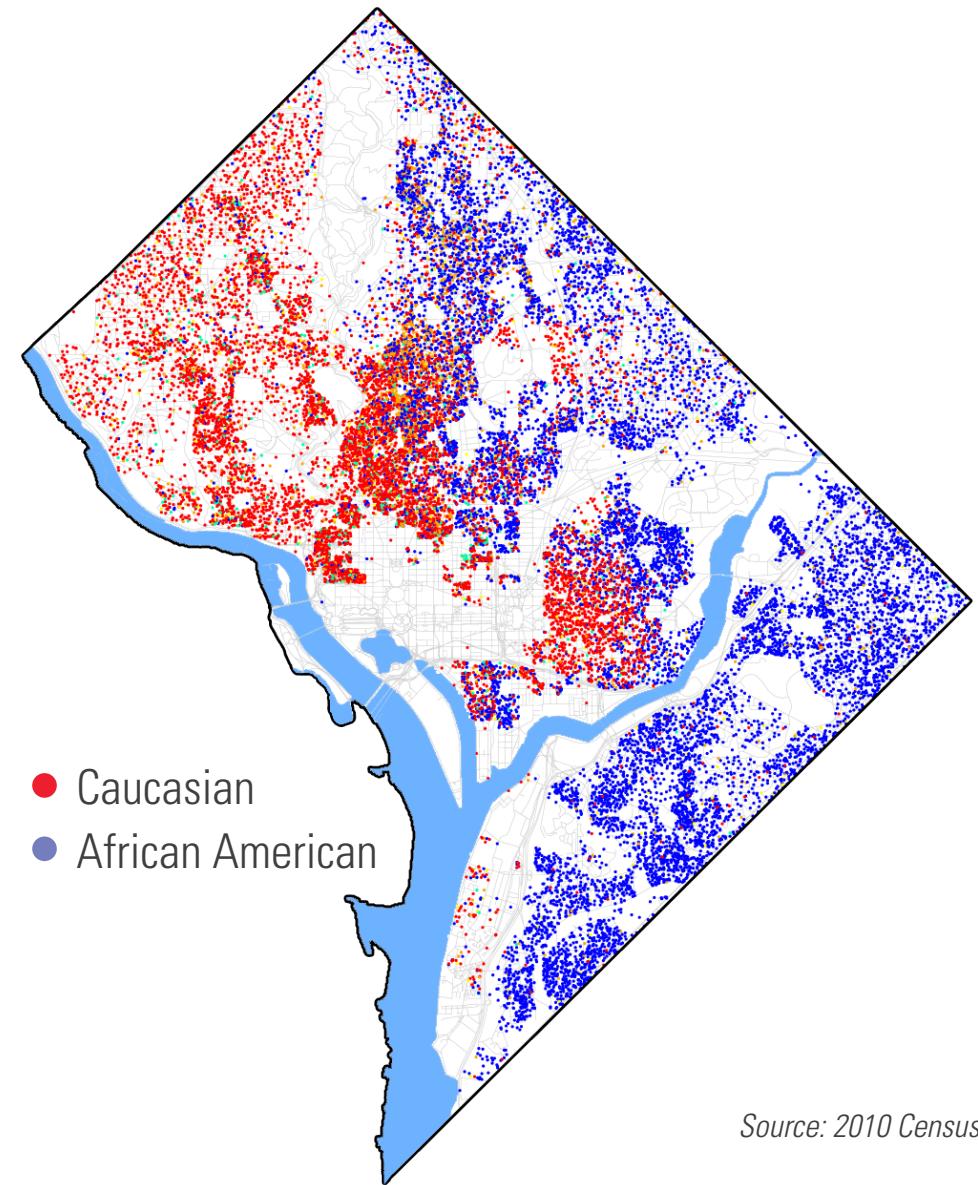
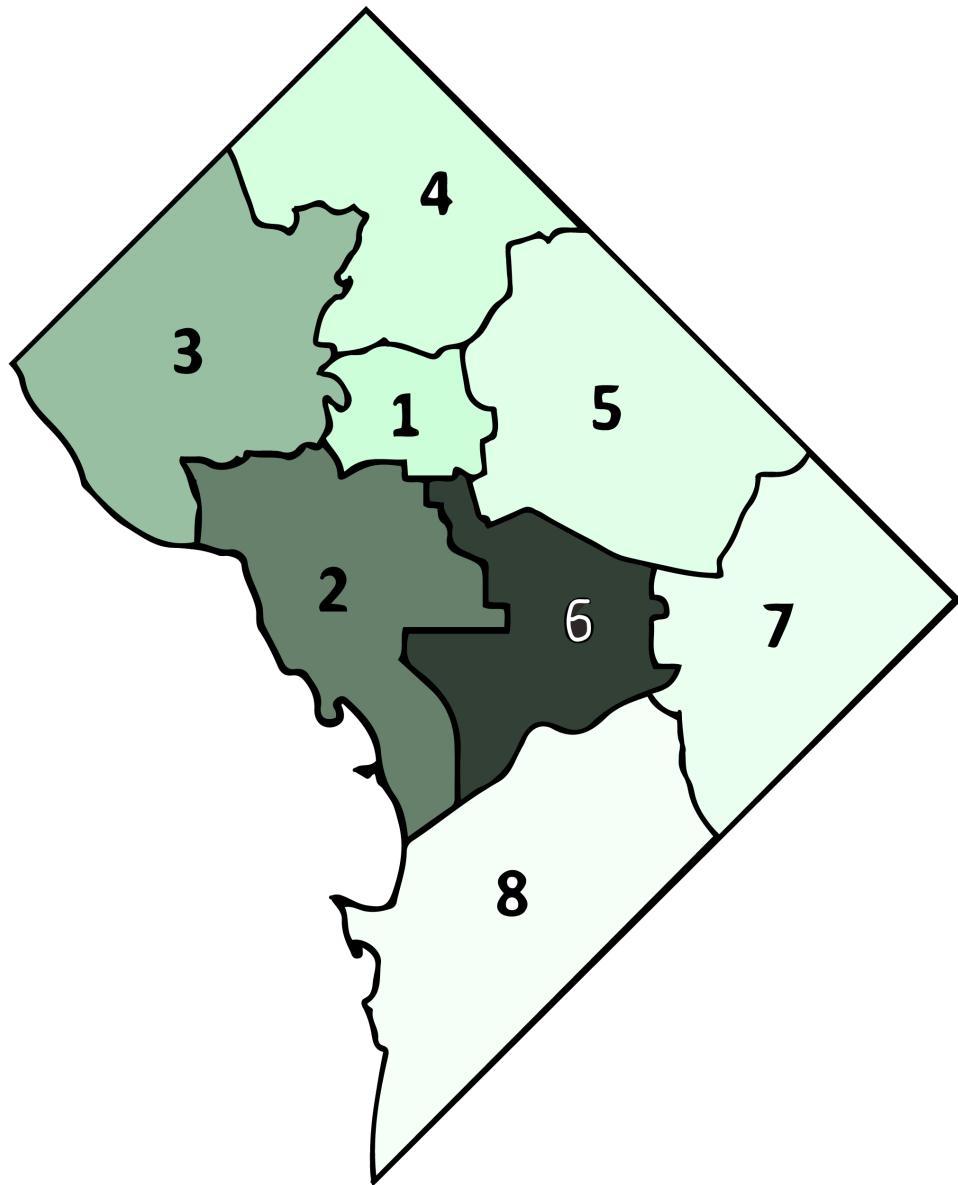
Ward 7 - 6,511

Ward 5 - 9,332

Ward 4 - 9,493



## ANALYSIS - WARD TURNOVER



Source: 2010 Census

# ANALYSIS - WARD TURNOVER

## HIGHEST

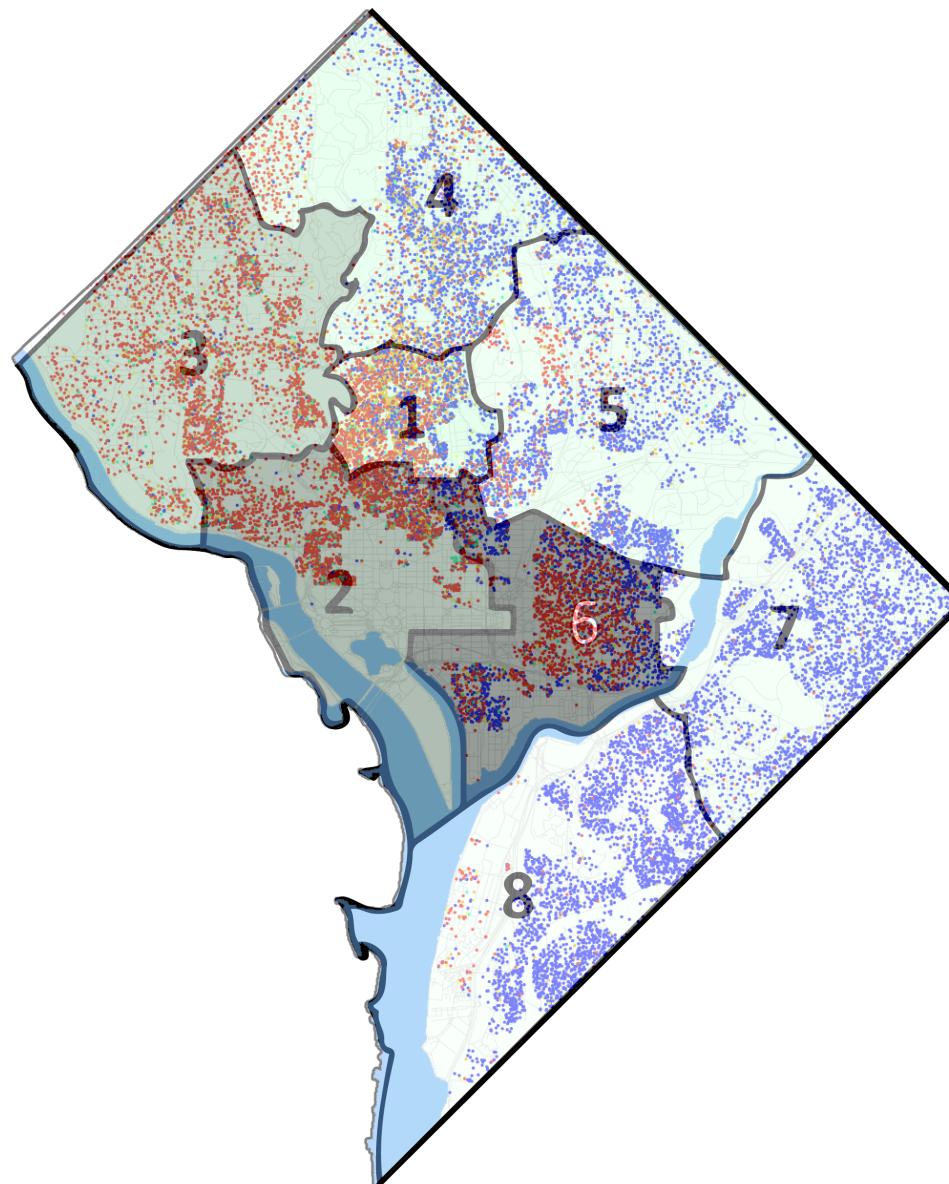
Ward 6 - 13,331

Ward 2 - 12,725

Ward 3 - 11,273

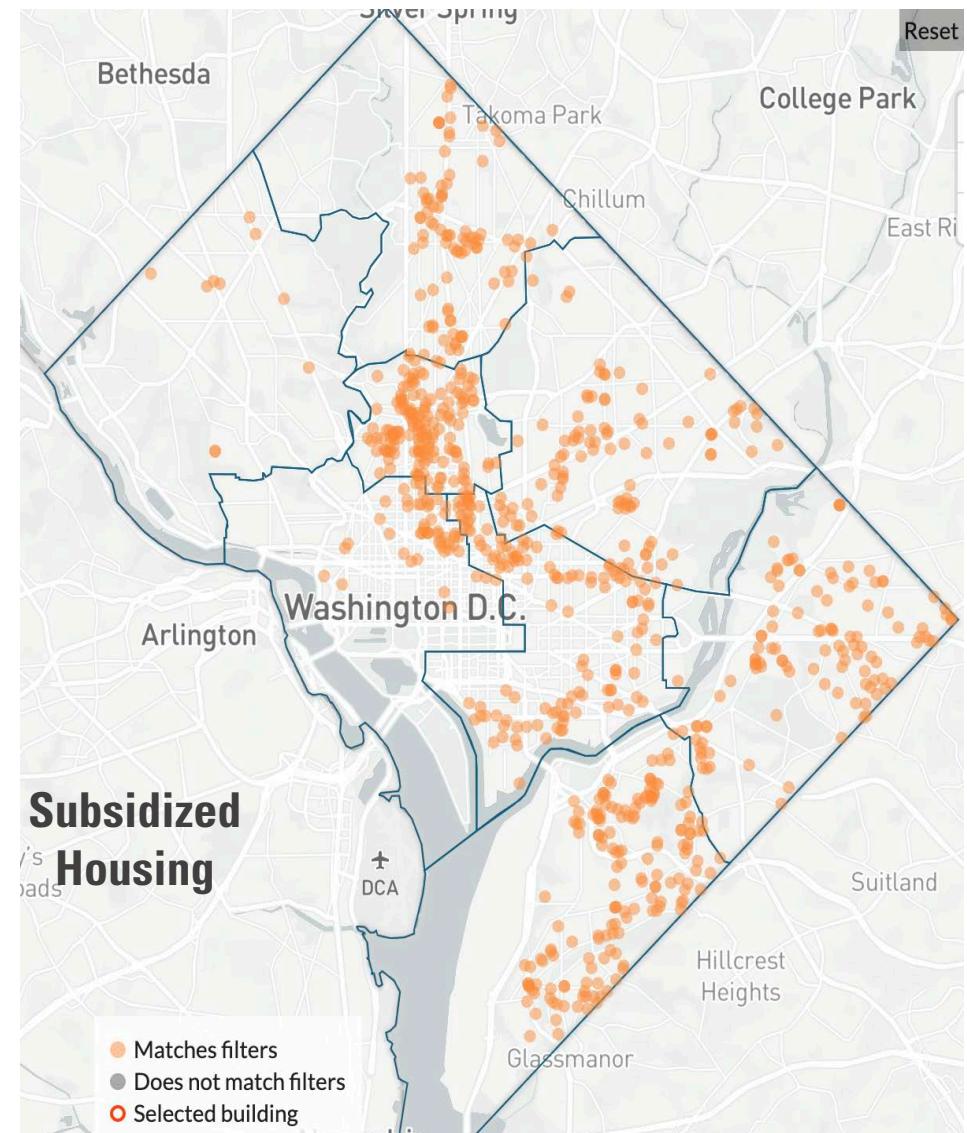
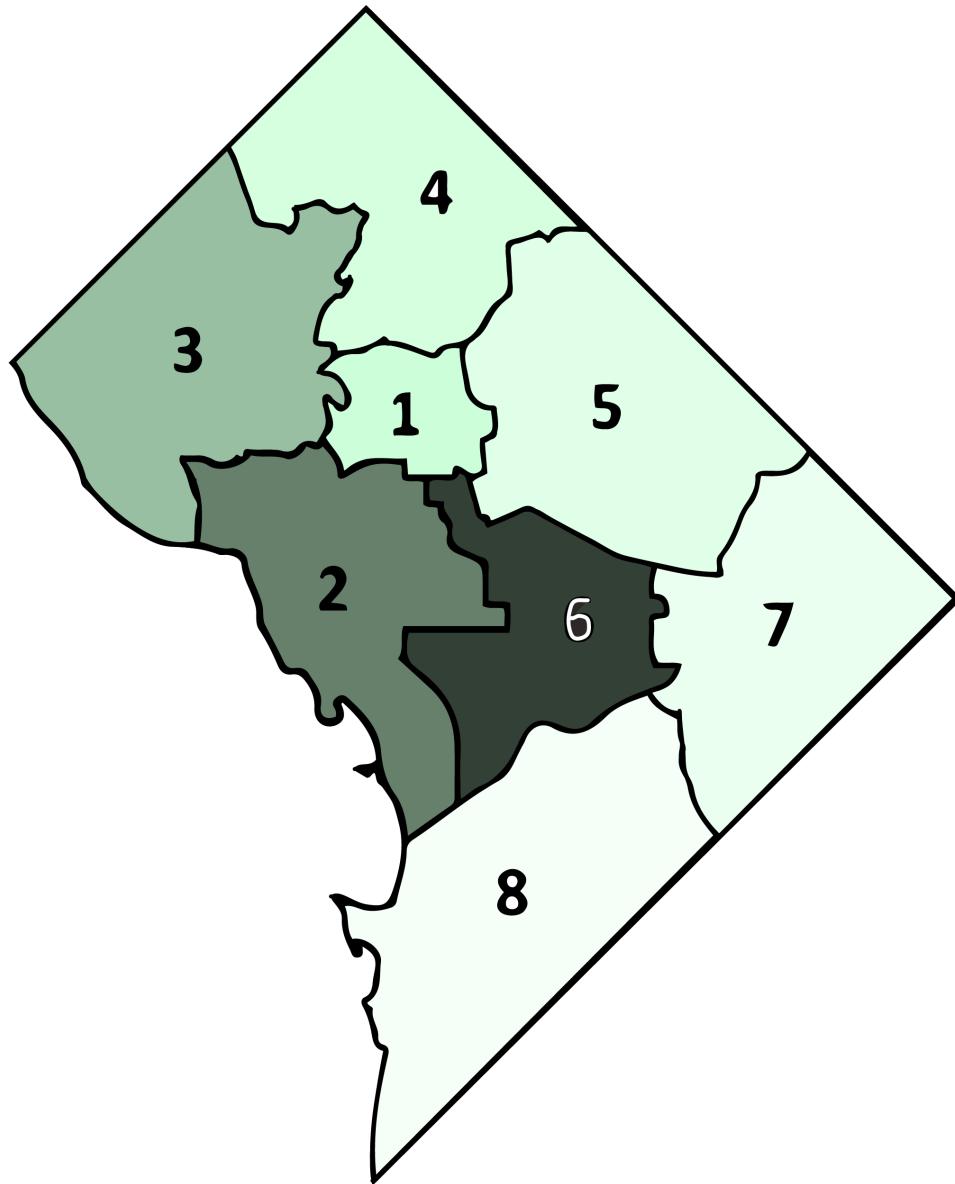
Ward 1 - 9,540

Ward 4 - 9,493



**Ethnicity distribution**  
as an indicator

# ANALYSIS - WARD TURNOVER

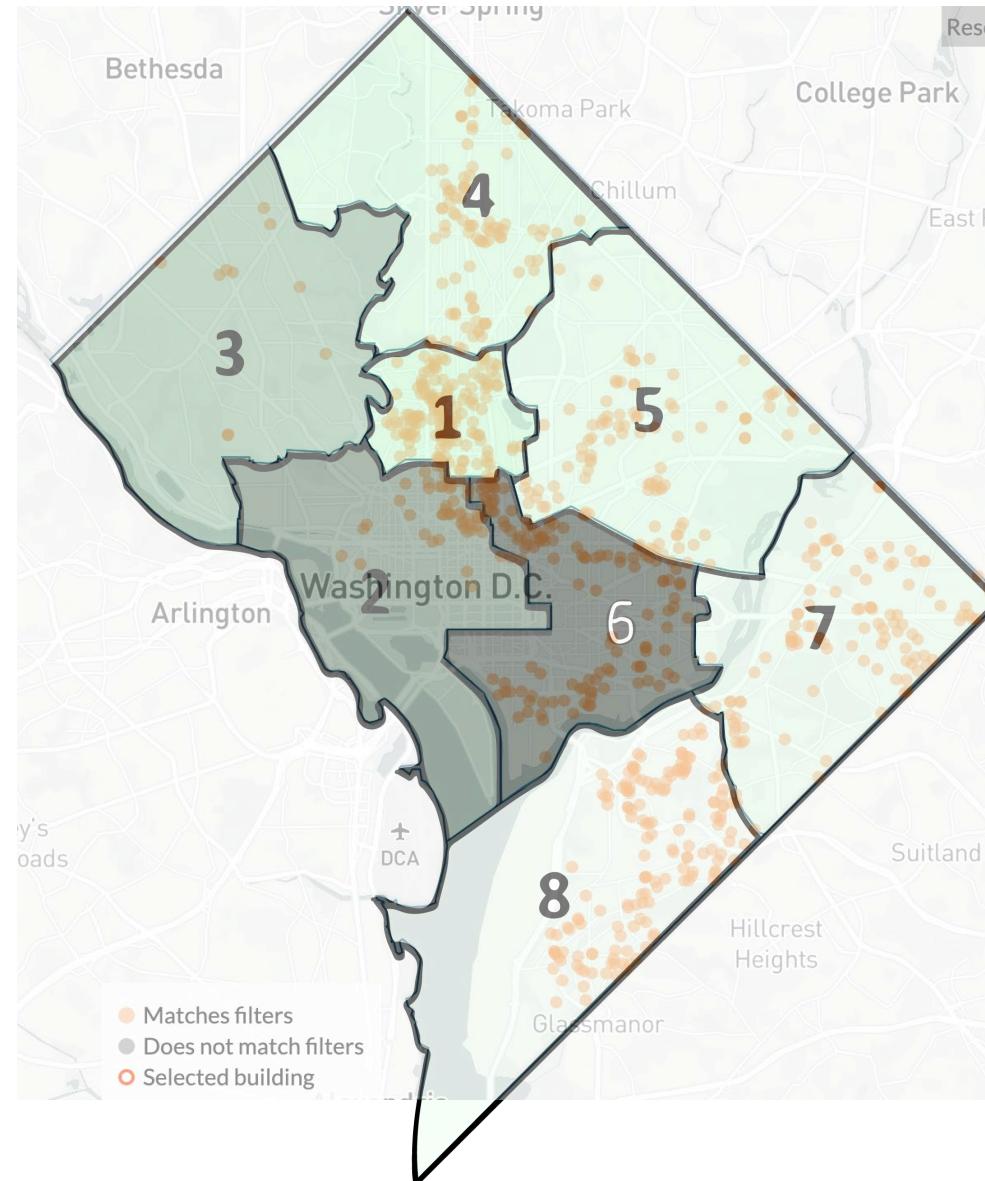


source: [housinginsights.org](http://housinginsights.org)

# ANALYSIS - WARD TURNOVER

## HIGHEST

- Ward 6 - 13,331
- Ward 2 - 12,725
- Ward 3 - 11,273
- Ward 1 - 9,540
- Ward 4 - 9,493



**Subsidized distribution**  
as an indicator



3

ADVISEMENT

*Which area(s) of DC hold the highest probability of future Return on Investment (ROI), based off historical data?*

Ward 4 and 1, respectively, present the highest probability of ROI on a residential real estate investment.



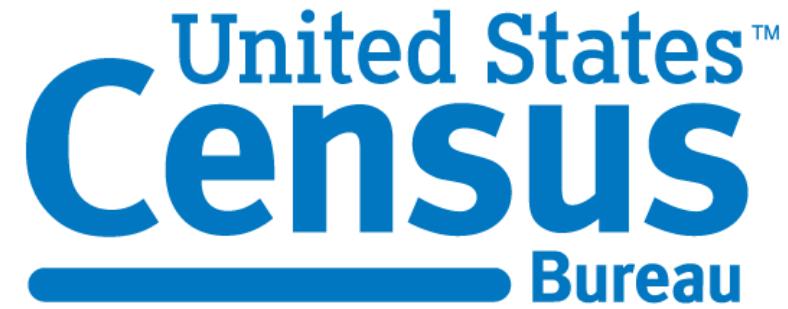
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LIMITATIONS



# Finer Scale

# 2020 Census



# Q & A



# THANK YOU!

