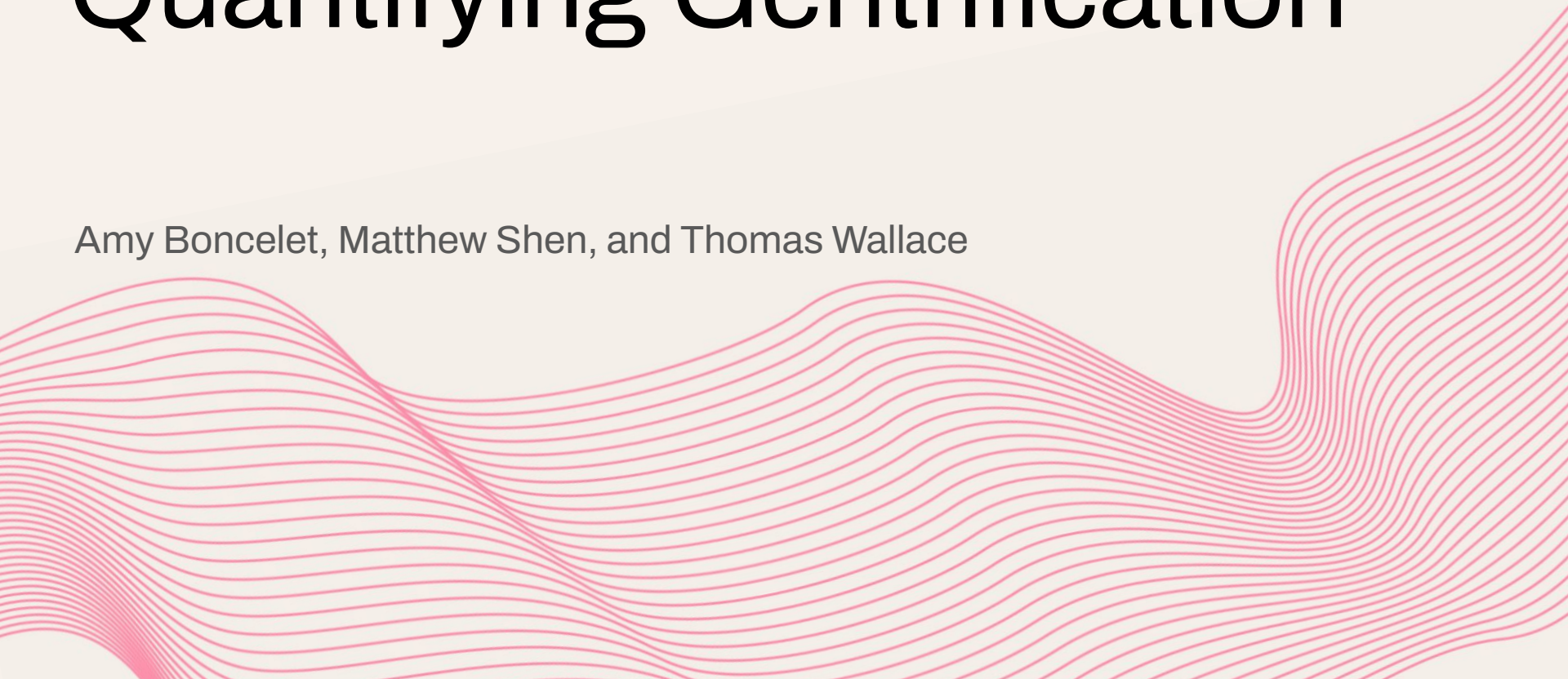


Quantifying Gentrification

Amy Boncelet, Matthew Shen, and Thomas Wallace



What is gentrification?

“The succession and replacement of classes”, where “the middle class returns to the inner city”, attracted by “convenient transportation, bustling commerce, and specific cultural atmosphere.”

Glass (Glass R. Aspects of Change London: MacGibbon & Kee, 1964)

Implications of gentrification

- Can push people out of housing market / neighborhood
- Changes character of a neighborhood
- Increase in discriminatory behaviour as new vs existing cultures clash



Project Goal

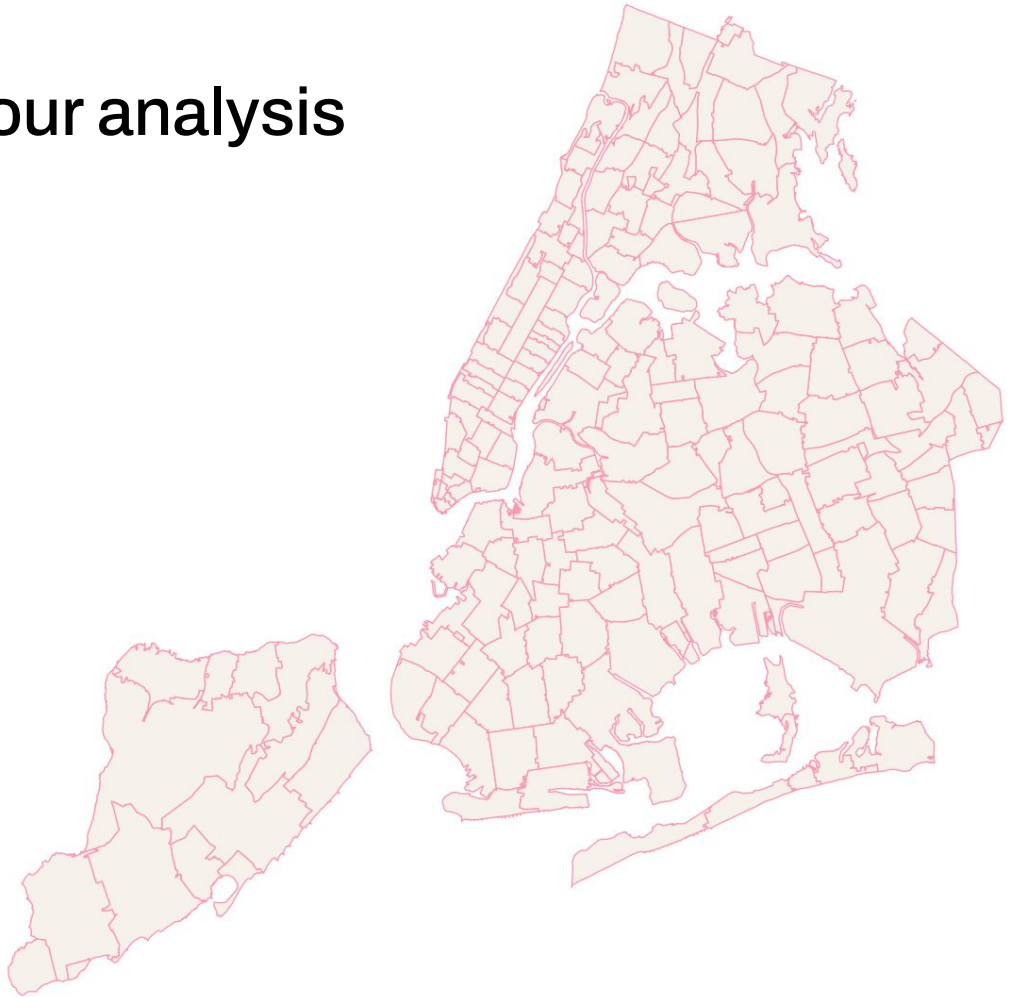
Evaluate New York City demographic characteristics to attempt to determine which neighborhoods have gentrified over the past decade

Factors we used to define gentrification

- Factors used which tend to **increase**:
 - % of the population that is white*
 - Median Income
 - Education level (Bachelor's degree or higher)*
 - Median Rent
- Factors used which tend to **decrease**:
 - Median Age
 - % of population that is foreign born (non-US Citizen)*

Specifically - how these factors change in each zip code relative to that of ***the mean*** of New York City

Where we focused our analysis



Data Sources and Methods

Data from US Census Bureau, between 2011-2019 (pre-covid):

- DP05: ACS DEMOGRAPHIC AND HOUSING ESTIMATES (age, % pop. white)
- S1901: INCOME IN THE PAST 12 MONTHS (median income)
- DP02 SELECTED SOCIAL CHARACTERISTICS IN THE UNITED STATES (% foreign born, education level)
- DP04: SELECTED HOUSING CHARACTERISTICS (median rent)

Coding methods:

- Pandas, geopandas, normalization

Methodology

A 6 Step process where we cleaned, normalized, compared and visualized the data.

Step 1: DF Creation

2011

ZIP CODE	Gentrification Factor 1	Gentrification Factor 2	...
10028	108432	26.2	
10029	98020	34.5	
10032	104084	23.5	
10067	76028	31.3	
...	
..	
.	.	.	

2019

ZIP CODE	Gentrification Factor 1	Gentrification Factor 2	...
10028	108432	26.2	
10029	98020	34.5	
10032	104084	23.5	
10067	76028	31.3	
...	
..	
.	.	.	

Step 2: Missing Data

ZIP CODE	Median Income	Age	...
10028	NaN	26.2	
10029	98020	34.5	
10032	104084	NaN	
10067	76028	31.3	
...	
..	
.	.	.	

Step 2: Missing Data

ZIP CODE	Median Income	Age	...
10028	NaN	26.2	
10029	98020	34.5	
10032	104084	NaN	
10067	76028	31.3	
...	
..	
.	.	.	

Step 2: Missing Data

ZIP CODE	Median Income	Age	...
10028	108322	26.2	
10029	98020	34.5	
10032	104084	32.9	
10067	76028	31.3	
...	
..	
.	.	.	

Step 3: Difference between 2011 and 2019

2011

ZIP CODE	Median Income	Age	...
10028	108432	26.2	
10029	98020	34.5	
10032	104084	32.9	
10067	76028	31.3	
...	
..	
.	.	.	

2019

ZIP CODE	Median Income	Age	...
10028	103456	25.2	
10029	124032	31.4	
10032	101244	23.5	
10067	79235	33.2	
...	
..	
.	.	.	

VS


$$32.9 - 23.5 = 9.4$$

Step 3: Difference between 2011 and 2019

ZIP CODE	Difference in Median Income	Difference in Age	...
10028	2031	1.2	
10029	2341	4.4	
10032	1872	9.4	
10067	985	0.2	
...	
..	
.	.	.	

Step 4: Normalize Data

ZIP CODE	Difference in Median Income <small>(norm)</small>	Difference in Age <small>(norm)</small>	...
10028	-0.4	0.7	
10029	0.2	0.2	
10032	-0.6	0.4	
10067	0.8	-0.9	
...	
..	
.	.	.	

Step 5: Gentrification Metric

ZIP CODE	Difference in Median Income <small>(norm)</small>	Difference in Age <small>(norm)</small>	...	Gentrification Metric
10028	-0.4	0.7	...	-0.482
10029	0.2	0.2	...	0
10032	-0.6	0.4	...	0.294
10067	0.8	-0.9	...	0.420
...
..
.

Step 6: Compare Zip Codes

NYC MEAN



ZIP CODE	Difference in Median Income (norm)	Difference in Age (norm)	...	Gentrification Metric
10028	-0.4	0.7	...	-0.482
10029	0.2	0.2	...	0
10032	-0.6	0.4	...	0.294
10067	0.8	-0.9	...	0.420
...
..
.

Step 6: Compare Zip Codes

NYC MEAN



Lower than Mean
= Less Gentrified

Higher than Mean
= More Gentrified

ZIP CODE	Difference in Median Income (norm)	Difference in Age (norm)	...	Gentrification Metric
10028	-0.4	0.7	...	-0.482
10029	0.2	0.2	...	0
10032	-0.6	0.4	...	0.294
10067	0.8	-0.9	...	0.420
...
..
.

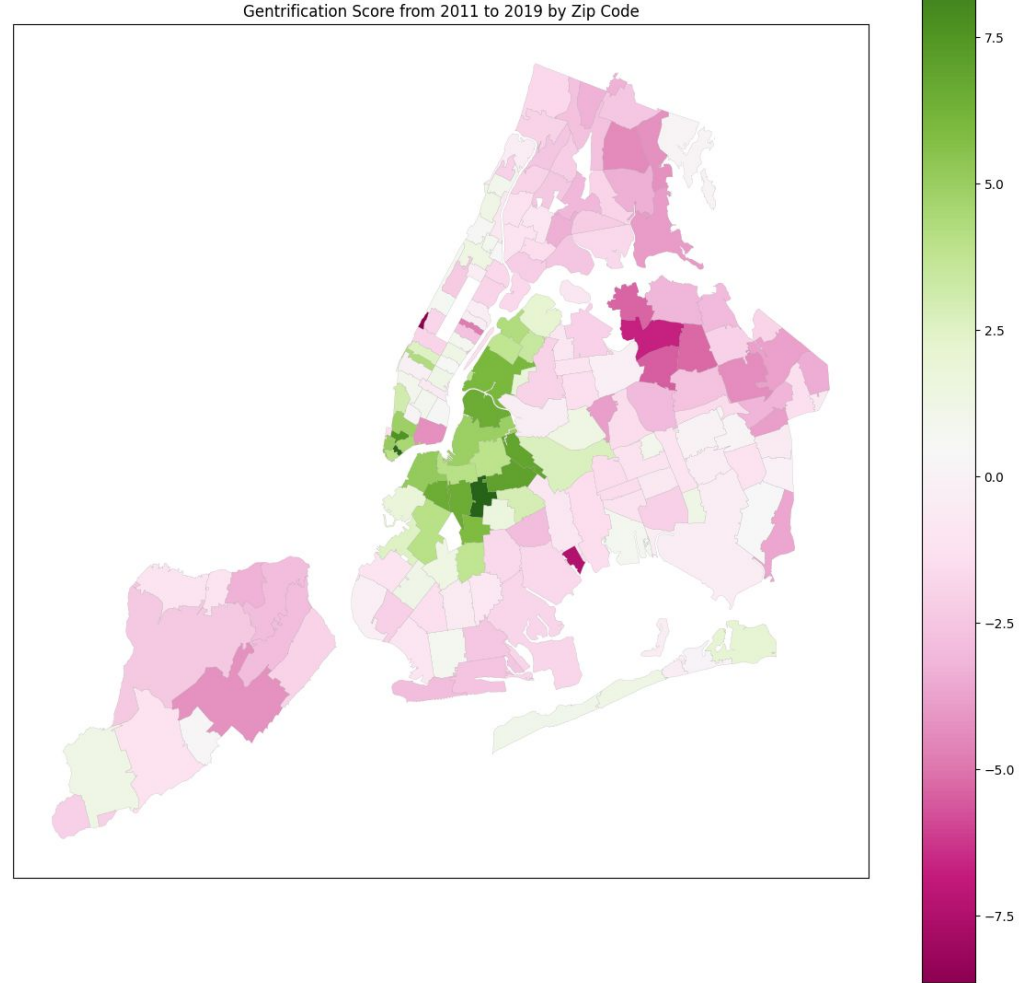
Analysis Results

Most Gentrified Zip Codes

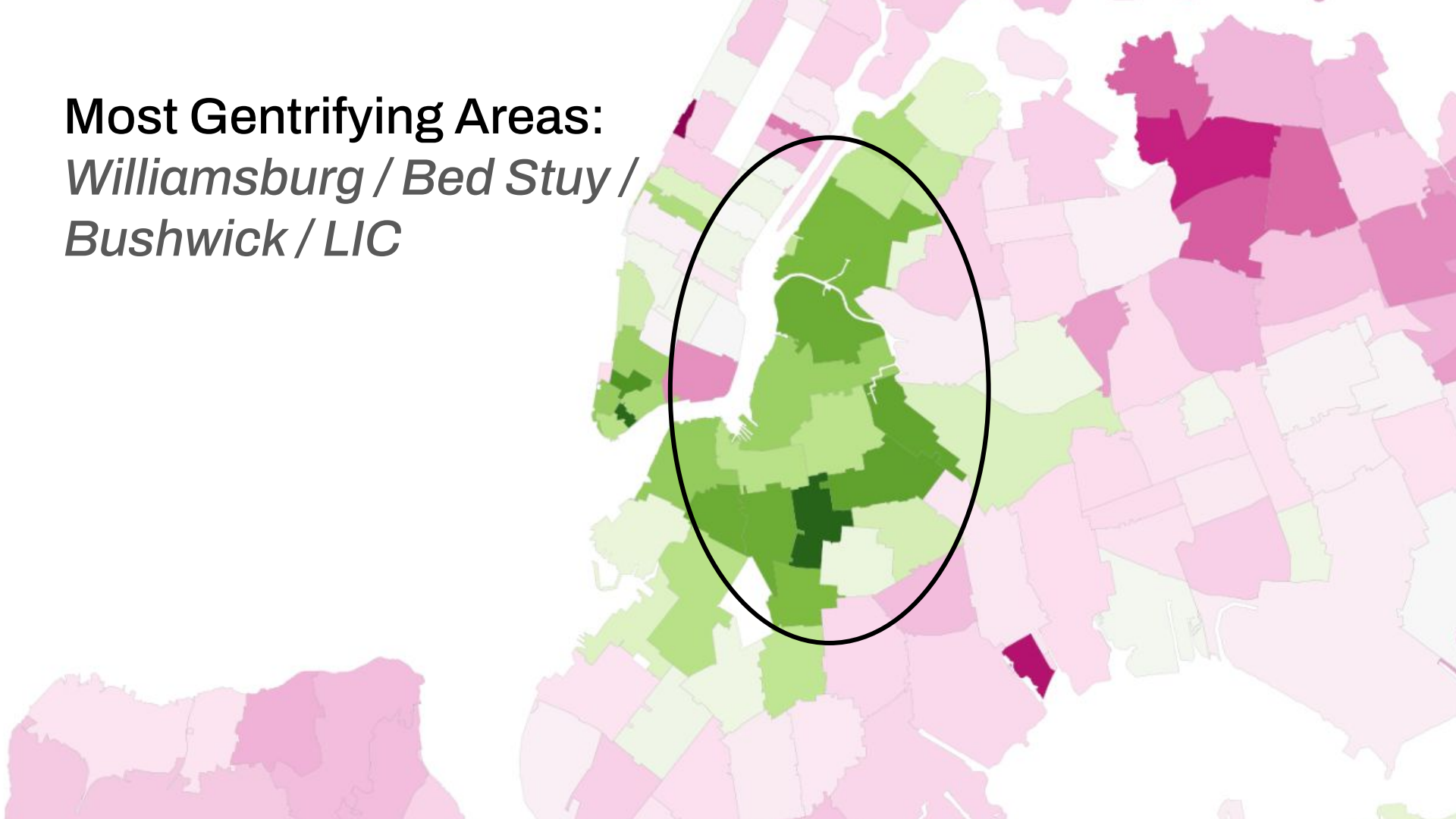
Zip Code	gentrification_metric
11216	9.514672
10005	9.319955
10007	7.550416
11221	6.962212
11237	6.824271
11217	6.525964
11238	6.513036
11222	6.477974
11101	6.033060
11225	5.830092

Least Gentrified Zip Codes

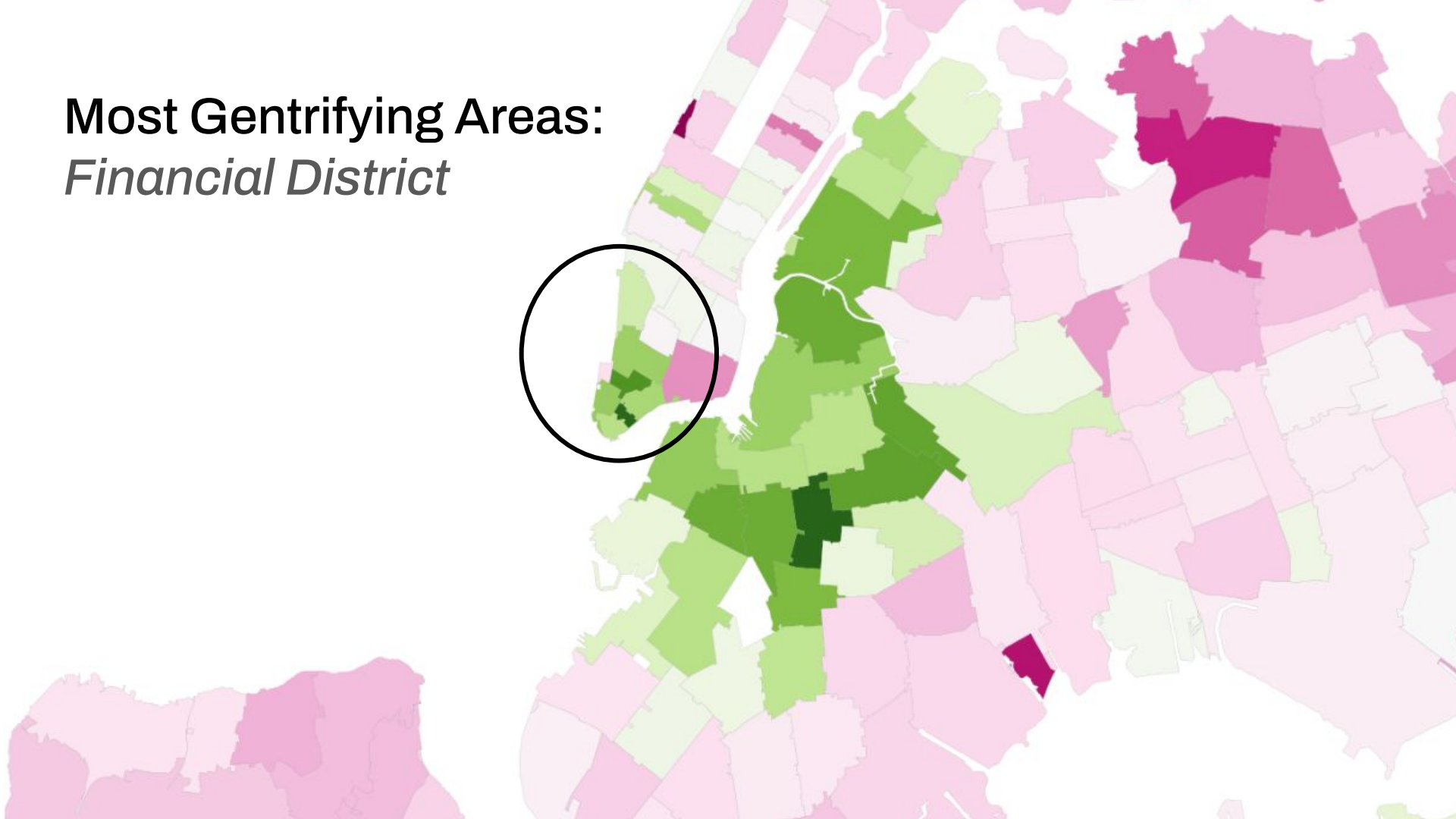
Zip Code	gentrification_metric
10002	-4.279068
11364	-4.334380
10469	-4.426066
10075	-4.876715
11358	-5.271829
11356	-5.323211
11355	-5.504511
11354	-6.682538
11239	-7.402178
10069	-8.647834



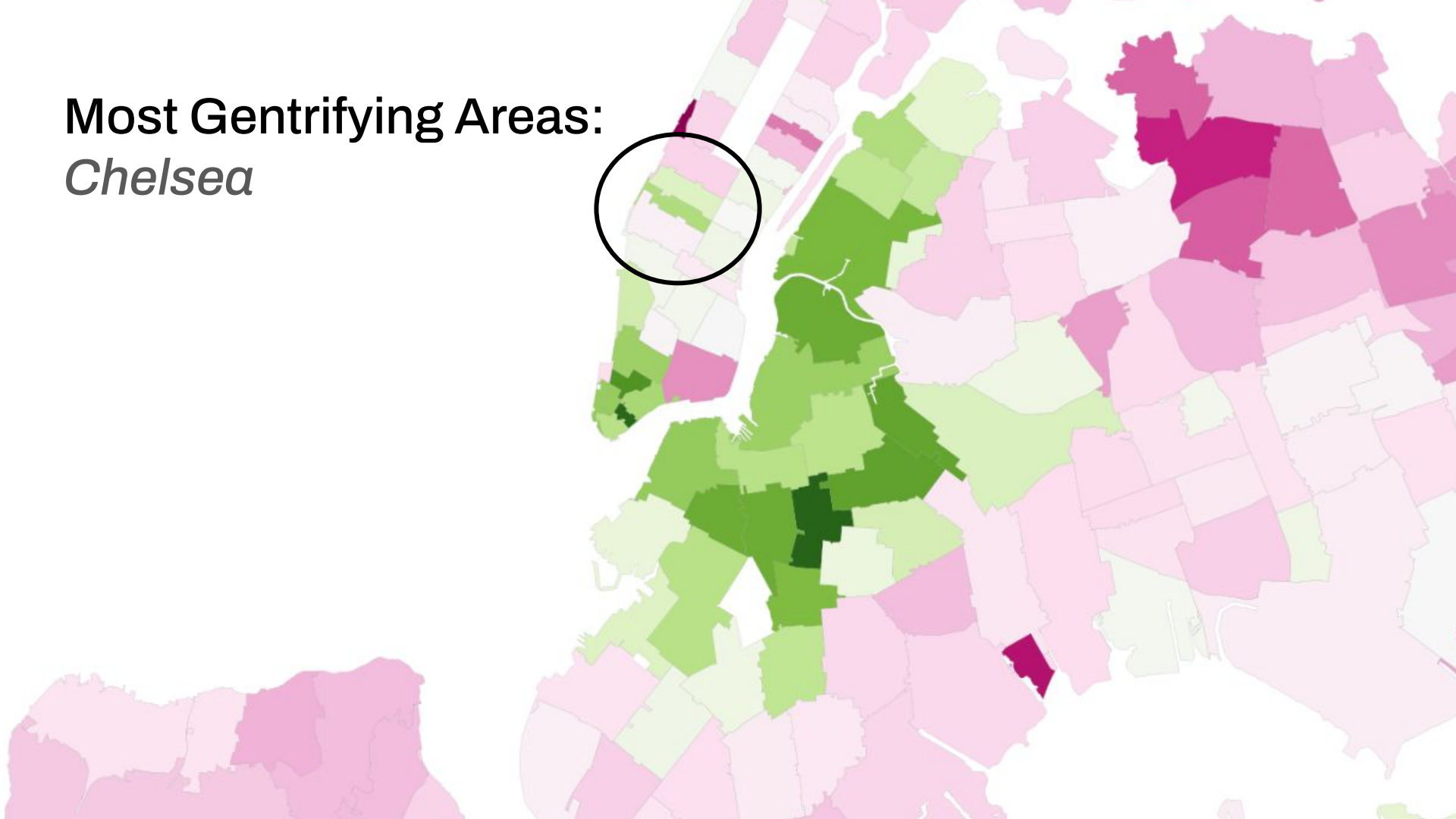
Most Gentrifying Areas:
Williamsburg / Bed Stuy /
Bushwick / LIC



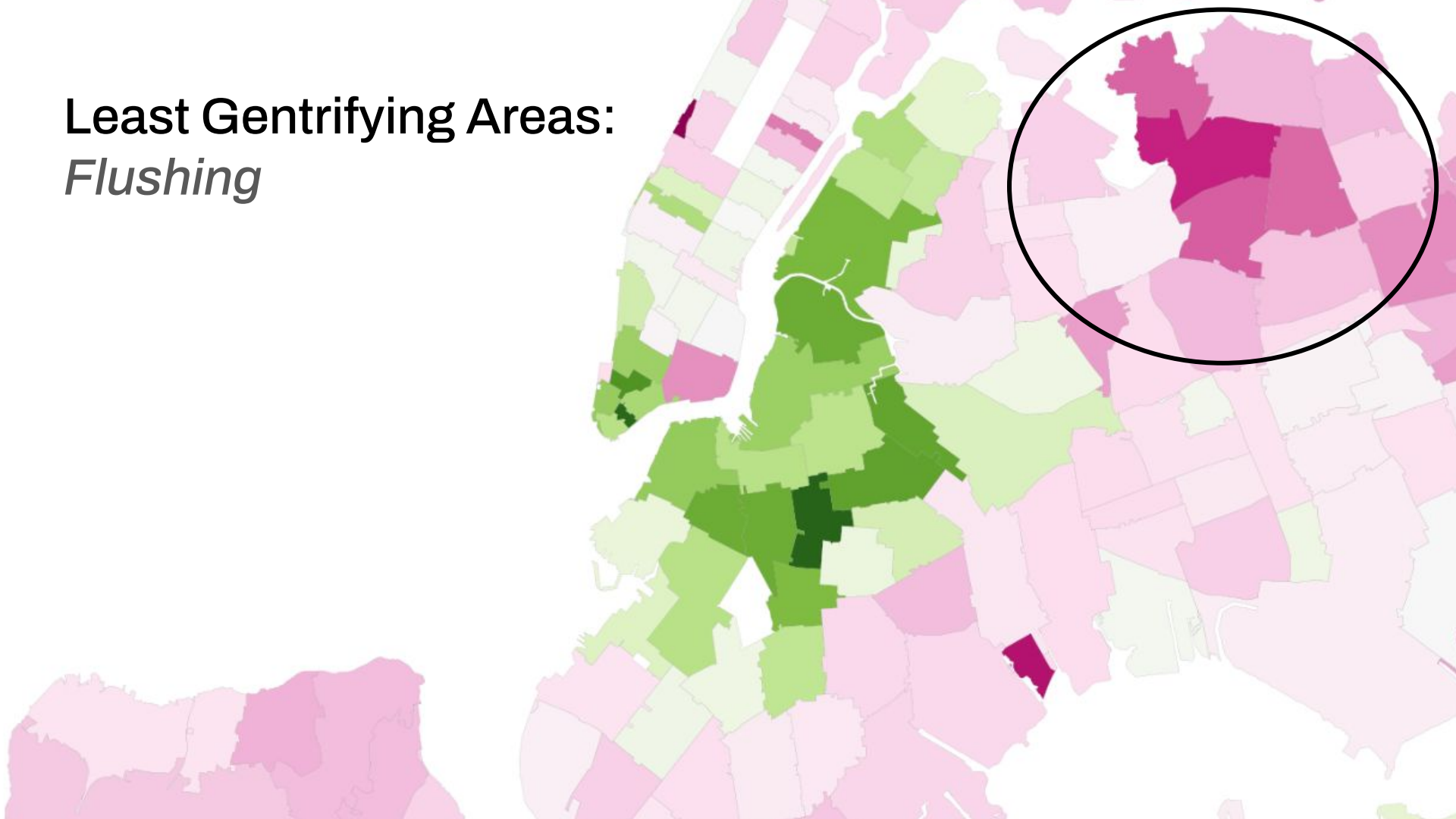
Most Gentrifying Areas: *Financial District*



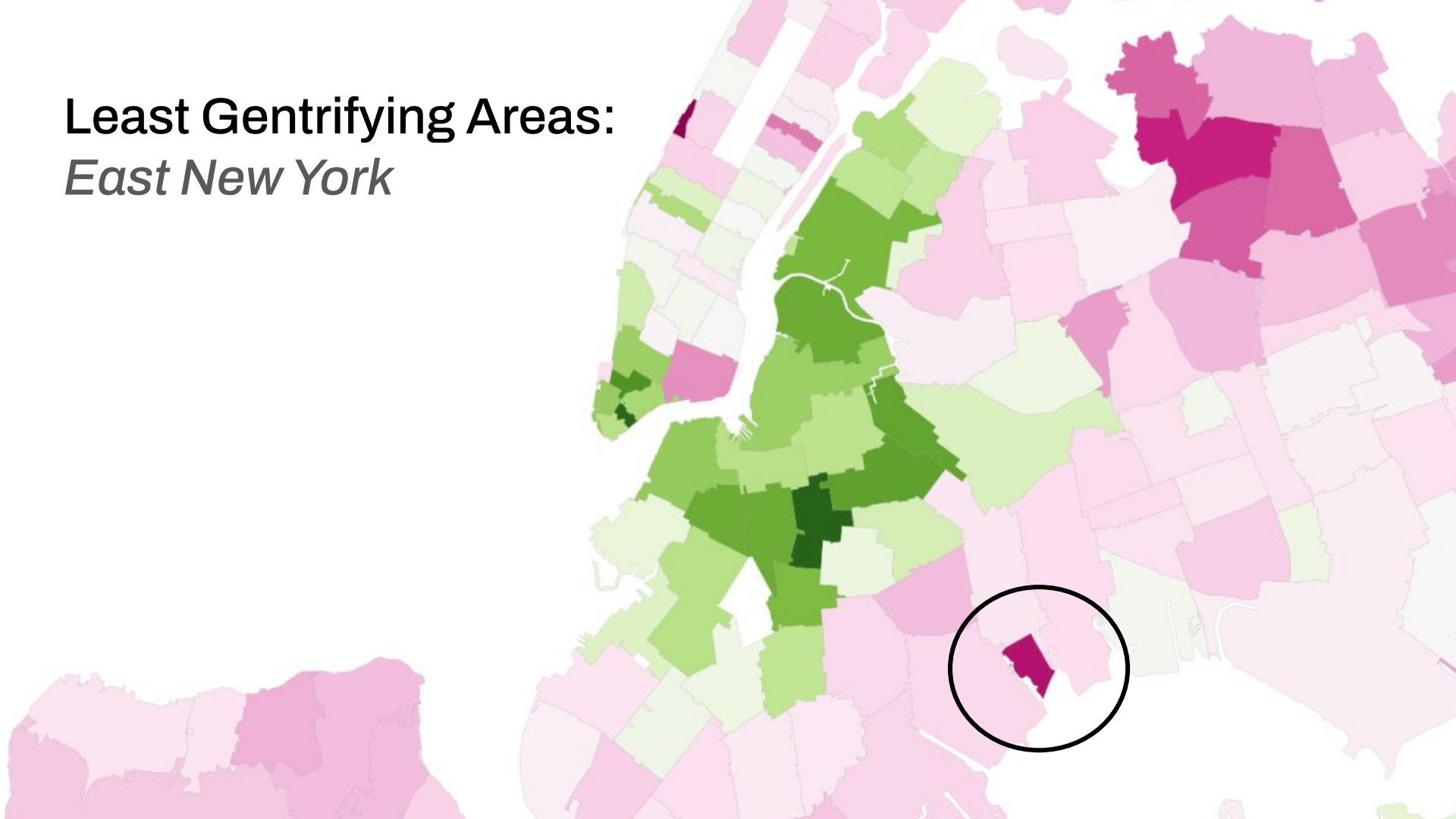
Most Gentrifying Areas:
Chelsea



Least Gentrifying Areas: *Flushing*

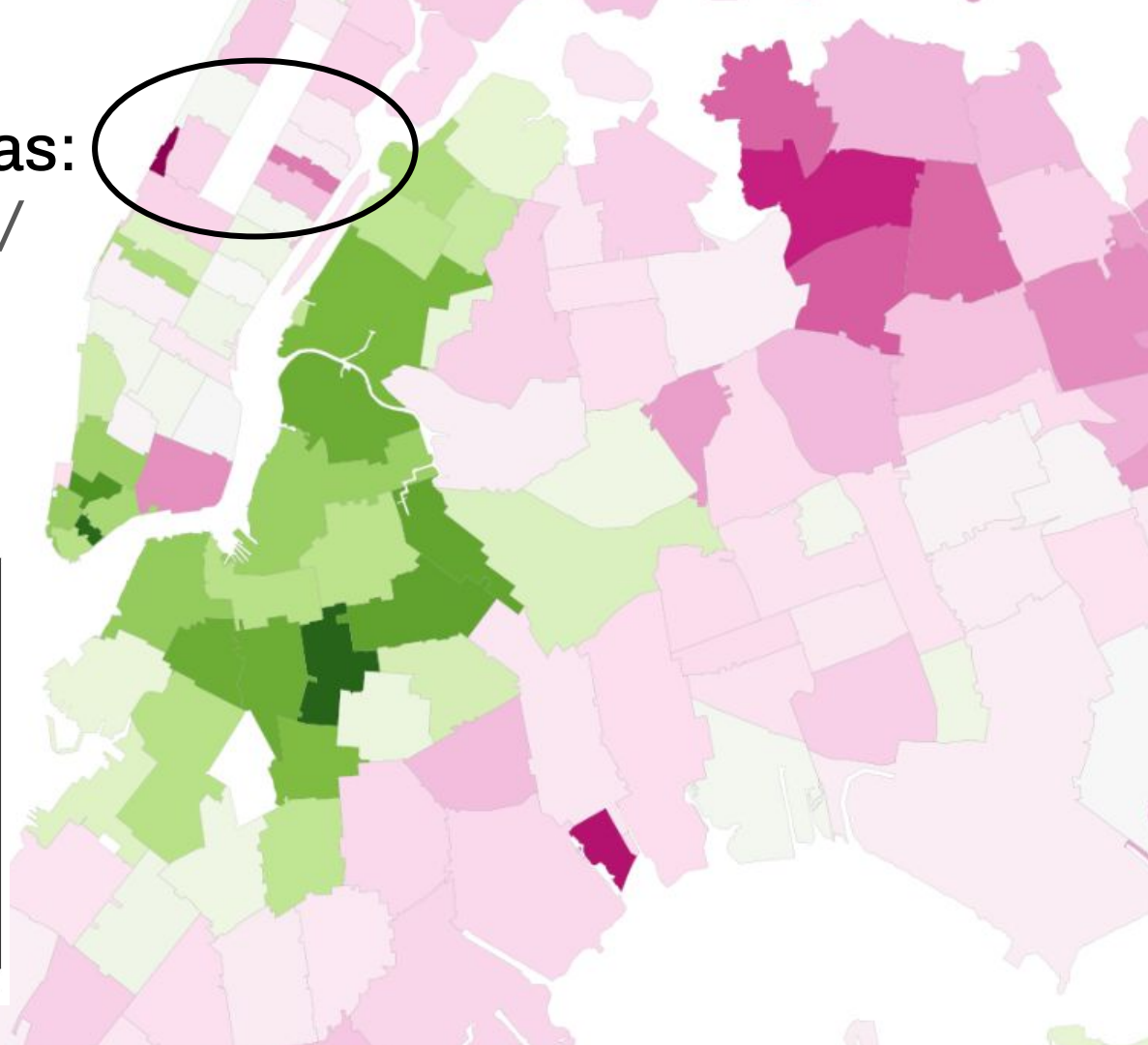
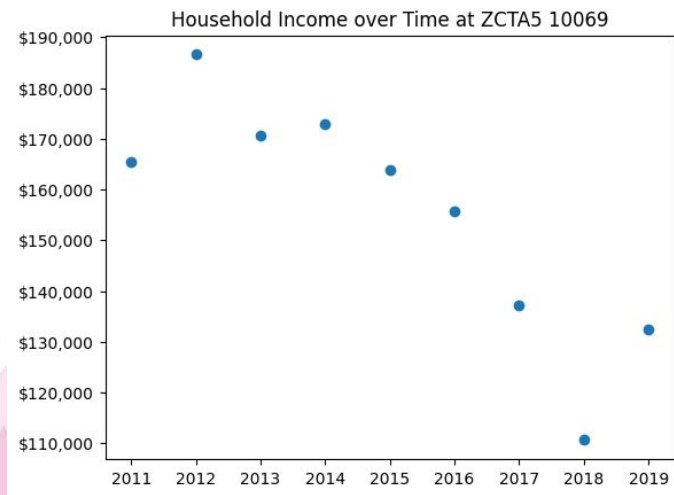


Least Gentrifying Areas: *East New York*



Least Gentrifying Areas:

*Riverside Park South /
Yorkville*



**Thank You.
Questions?**

