

# Mapping Population and Place Visit Changes of Chinese Ethnic Enclaves within New York City

## Spatial Questions

1. Can the supposed decline of Chinatown, Manhattan and growth of Sunset Park, Brooklyn and Flushing, Queens be temporally contextualized through race and rent/income maps?
  
2. Did place visits in NYC Chinese ethnic enclaves decrease at a greater rate with respect to their home boroughs during the years 2019-2021?

Click on a borough to begin





美東超市

US EASTERN  
SUPERMARKET INC.  
Tel: 212-933-8889

霧都

646-1224-18889  
美容 美髮

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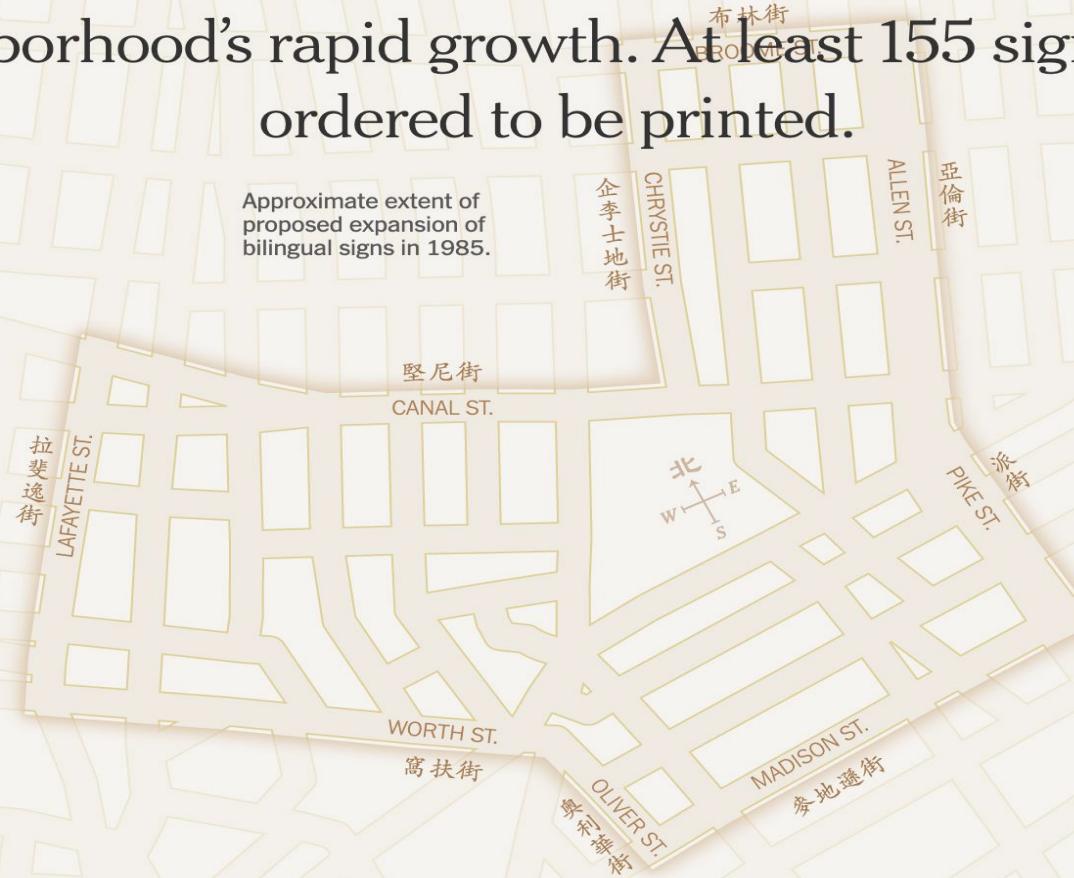




## Context

- Origin in 1850s
- Steady decrease in its Asian population since 2011
  - Increased rent and nearby construction of luxury towers
- Overall Asian population in New York has increased
  - Flushing, Queens
  - Sunset Park, Brooklyn
- Flushing larger than Chinatown today
- Literature Review: Mapping "dying"/"declining" cities through socioeconomic change
  - [Asian ethnic neighborhood change in California](#)
  - [Socioeconomic Change of Chicago Communities](#)

In 1985, the program was expanded to reflect the neighborhood's rapid growth. At least 155 signs were ordered to be printed.



Today, the Chinese population in Chinatown is shrinking. And with it, the number of bilingual street signs, as old signs get removed or replaced with English-only signs.



## Covid-19

- Loss of business
- Increased anti-AAPI violence
- Hostility from government
- The Effects of COVID-19 on Chinatown: An Analysis of Ethnic Enclave Participation and Immigrant Entrepreneurship in the Restaurant Industry



## Significance

- Want to make sure these communities are seen
- Housing policy
  - Rent + gentrification
- Preservation of culture
- Aid to businesses

## Data

- ACS Data 5-Year Estimates 2010-2014 by Census Tract
- ACS Data 2014-2019 5-Year Estimates by Census Tract
- SafeGraph Patterns Data from April 2019, 2020, and 2021
- 2020 NYC OpenData Neighborhood Tabulation
- NYC OpenData Zip Code Blocks
- 2014 Tiger/LINE New York City Census Tracts
- 2019 Tiger/LINE New York City Census Tracts

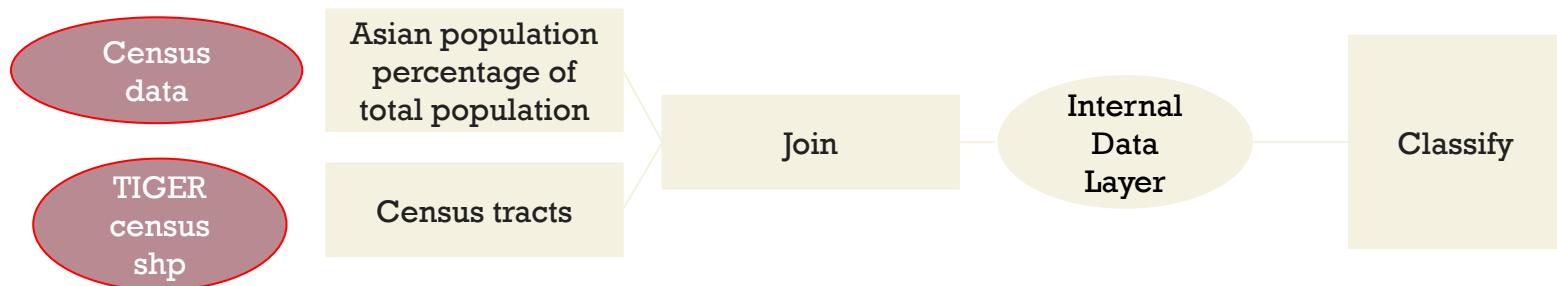
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	placekey	parent_place	location_nan	street_address	city	region	postal_code	date_range	date_range	raw_visit_count	raw_visitor	conc_acc				
2	222-222@627-s8j-zj9	DF Discount	210 W 29th St	New York	NY		10001	2021-04-01T	2021-05-01T	24	14	210 W 29th St, New York, NY, 10001				
3	222-222@627-s8r-6c5	Sports Illustr	135 W 50th St	New York	NY		10020	2021-04-01T	2021-05-01T	19	18	135 W 50th St, New York, NY, 10020				
4	222-222@627-s8r-rp9	Deliteria Deli	1061 2nd Ave	New York	NY		10022	2021-04-01T	2021-05-01T	22	19	1061 2nd Ave, New York, NY, 10022				
5	222-222@627-wbt-r8v	INA PINCH S	537 W 27th St	New York	NY		10001	2021-04-01T	2021-05-01T	21	15	537 W 27th St, New York, NY, 10001				
6	222-222@627-wc7-vcq	Arte Restaur	21 E 9th St	New York	NY		10003	2021-04-01T	2021-05-01T	290	128	21 E 9th St, New York, NY, 10003				
7	222-224@627-s6d-xh5	Salento Colo	2112 Amster	New York	NY		10032	2021-04-01T	2021-05-01T	140	103	2112 Amsterdam Ave, New York, NY, 10032				
8	222-224@627-s8k-35z	Marcus Brotl	980 Avenue C	New York	NY		10018	2021-04-01T	2021-05-01T	230	158	980 Avenue of the Americas, New York, NY, 10018				
9	222-224@627-wbz-rtv	Dill & Parsley	110 Maiden	New York	NY		10005	2021-04-01T	2021-05-01T	195	75	110 Maiden Ln, New York, NY, 10005				
10	222-226@627-wbn-b8v	Le Grill de Jc	85 10th Ave	New York	NY		10011	2021-04-01T	2021-05-01T	67	46	85 10th Ave, New York, NY, 10011				
11	223-222@627-s8h-xbk	Kaylee's Cre	115 E 27th St	New York	NY		10016	2021-04-01T	2021-05-01T	50	33	115 E 27th St, New York, NY, 10016				
12	223-222@627-s8k-zmk	Mughlai Gril	6 Clinton St	New York	NY		10002	2021-04-01T	2021-05-01T	8	6	6 Clinton St, New York, NY, 10002				
13	223-222@627-wbz-tn5	Brooklyn Chc	150 Nassau St	New York	NY		10038	2021-04-01T	2021-05-01T	589	351	150 Nassau St, New York, NY, 10038				
14	223-223@627-s8j-k9f	Mela Diner	288 Lexington	New York	NY		10016	2021-04-01T	2021-05-01T	250	136	288 Lexington Ave, New York, NY, 10016				
15	224-222@627-s8j-rff	New York Ur	334 E 26th St	New York	NY		10010	2021-04-01T	2021-05-01T	69	45	334 E 26th St, New York, NY, 10010				
16	225-222@627-s4m-ty9	Michael's Th	1125 Madisc	New York	NY		10028	2021-04-01T	2021-05-01T	118	92	1125 Madison Ave, New York, NY, 10028				
17	225-222@627-s4n-tgk	Cafe Jax	318 E 84th St	New York	NY		10028	2021-04-01T	2021-05-01T	170	65	318 E 84th St, New York, NY, 10028				
18	225-222@627-s4s-m6k	Grant Dcc	1299 Amsterdam	New York	NY		10027	2021-04-01T	2021-05-01T	146	65	1299 Amsterdam Ave, New York, NY, 10027				
19	225-222@627-s8r-qmk	Sutton Cafe	1026 1st Ave	New York	NY		10022	2021-04-01T	2021-05-01T	94	55	1026 1st Ave, New York, NY, 10022				
20	225-223@627-s4r-4qf	La Fontaine	155 W 66th St	New York	NY		10023	2021-04-01T	2021-05-01T	1	1	155 W 66th St, New York, NY, 10023				
21	225-224@627-wc7-3qz	Space NK Ap	504 Broadway	New York	NY		10012	2021-04-01T	2021-05-01T	1	1	504 Broadway, New York, NY, 10012				
22	225-225@627-s8q-syv	Nippon	155 E 52nd St	New York	NY		10022	2021-04-01T	2021-05-01T	256	112	155 E 52nd St, New York, NY, 10022				
23	225-227@627-s4w-3qz	Her Chic Hair	2130 Adam C	New York	NY		10027	2021-04-01T	2021-05-01T	1	1	1 2130 Adam Clayton Powell Jr Blvd Ste 101, New York, NY, 10027				
24	225-229@627-s8k-2ff	Texlin	109 W 38th St	New York	NY		10018	2021-04-01T	2021-05-01T	53	33	109 W 38th St, New York, NY, 10018				
25	226-222@627-s6d-v75	Lourdes Brid	2188 Amsterdam	New York	NY		10032	2021-04-01T	2021-05-01T	4	2	2 2188 Amsterdam Ave, New York, NY, 10032				
26	226-222@627-s8r-yjv	Leora Manis	145 W 58th St	New York	NY		10019	2021-04-01T	2021-05-01T	21	16	145 W 58th St, New York, NY, 10019				
27	226-223@627-s8j-6hq	Royal Siam T	240 8th Ave	New York	NY		10011	2021-04-01T	2021-05-01T	28	26	240 8th Ave, New York, NY, 10011				
28	227-222@627-s4n-pgk	J and J Food	153 E 99th St	New York	NY		10029	2021-04-01T	2021-05-01T	67	48	153 E 99th St, New York, NY, 10029				
29	227-222@627-s4v-2tv	7-Eleven	1642 Lexington	New York	NY		10029	2021-04-01T	2021-05-01T	146	101	1642 Lexington Ave, New York, NY, 10029				
30	227-222@627-wc7-92k	Time Cafe	105 Canal St	New York	NY		10002	2021-04-01T	2021-05-01T	351	192	105 Canal St, New York, NY, 10002				
31	227-222@627-wc7-wc5	Sky High Sou	150 Forsyth St	New York	NY		10002	2021-04-01T	2021-05-01T	2	2	2 150 Forsyth St, New York, NY, 10002				
32	227-227@627-s8r-h89	Prazdnik Jew	78 W 47th St	New York	NY		10036	2021-04-01T	2021-05-01T	3	3	3 78 W 47th St, New York, NY, 10036				
33	228-222@627-s4k-ghq	Au Jus	2621 Broadway	New York	NY		10025	2021-04-01T	2021-05-01T	282	124	2621 Broadway, New York, NY, 10025				
34	228-222@627-s8h-v2k	Solo Pizza	30 Lexington	New York	NY		10010	2021-04-01T	2021-05-01T	156	115	30 Lexington Ave, New York, NY, 10010				
35	228-222@627-s8j-n5z	Atma Yoga	T 109 E 29th St	New York	NY		10016	2021-04-01T	2021-05-01T	65	31	109 E 29th St, New York, NY, 10016				
36	228-222@627-s8j-74t	Spring Street	187 Spring St	New York	NY		10012	2021-04-01T	2021-05-01T	15	15	187 Spring St, New York, NY, 10012				

# Methodology

## Race:

- Clean census data
- Join Asian population data to census tracts
- Calculate percentage of Asian population out of total population
- Outline relevant neighborhoods
- Classify by graduated symbology

# Race Map

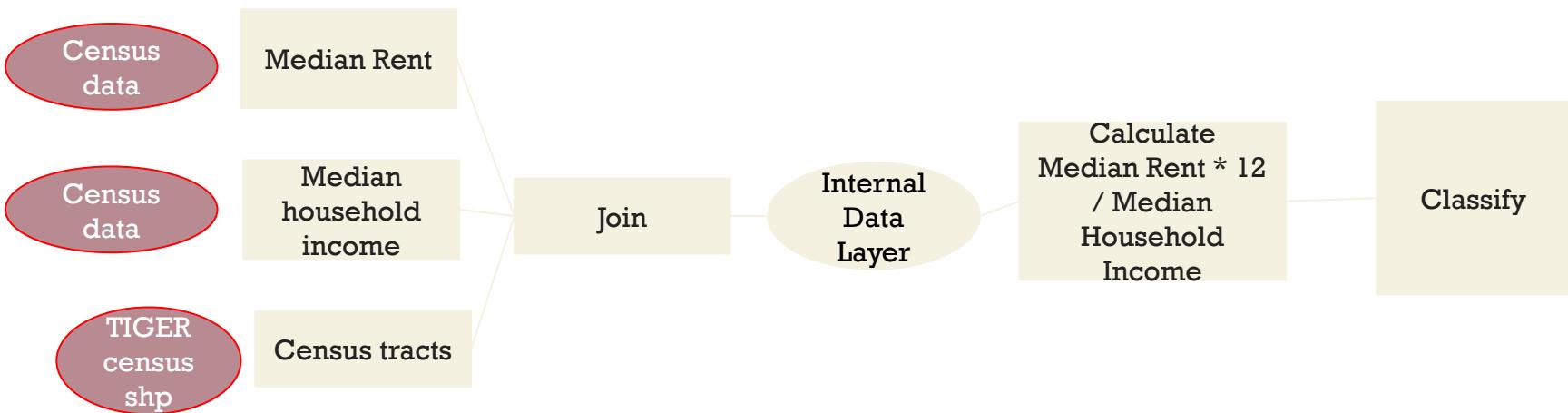


## Methodology

### **Percent Rent of Income:**

- Clean census data of median rent and median household income
- Join rent and income data to census tracts
- Multiply median rent by 12 to get annual rent cost
- Divide annual median rent by annual median income for Asian population
- Outline relevant neighborhoods
- Classify by graduated

## Percent Rent of Income



# Methodology

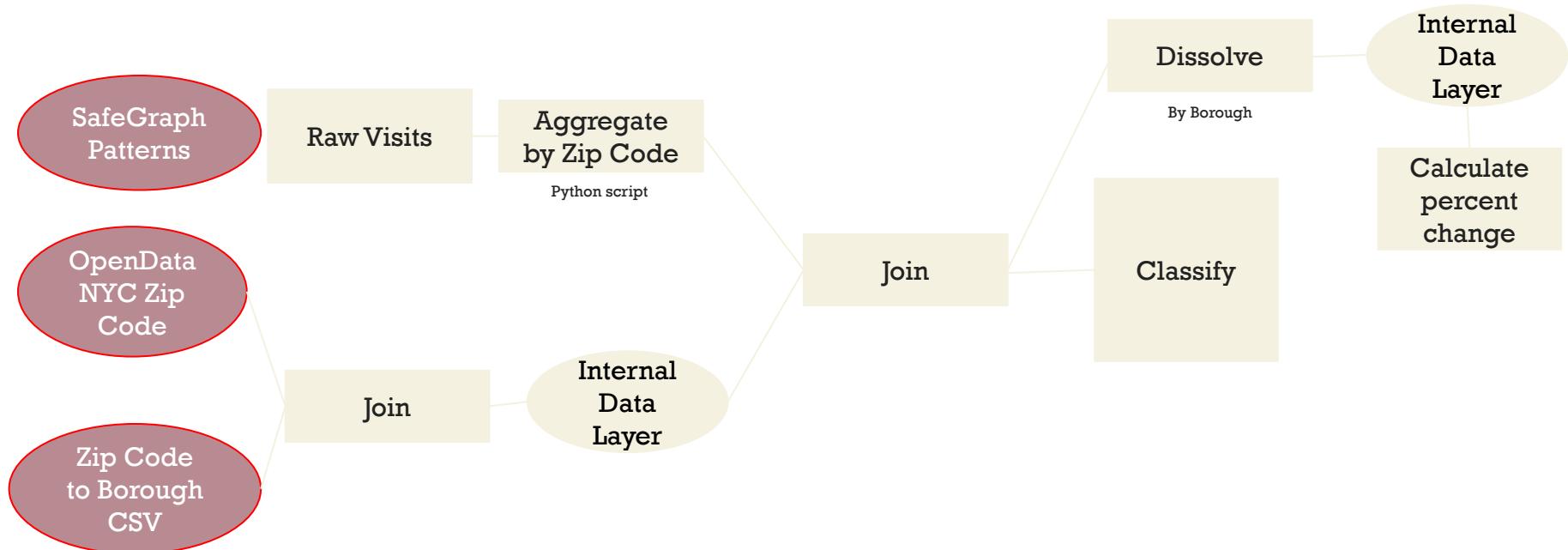
## Points of Interest:

- Python script to clean Safegraph data to aggregate points of interest raw visit counts by zip code
- Spatial join of data to zip code blocks
- Classify by graduated symbology

To calculate percent change:

- Sum counts of zip codes that fall within relevant neighborhoods
- Join zip code with borough names
- Dissolve by zip code to aggregate all visits for a borough

# Points of Interest Patterns Map





Percent Asian Population in Chinatown, Manhattan by Census Tracts in 2014

Legend

- Open Land
- Open Water
- Chinatown, Manhattan

Percent Asian Population

- Zero Population
- 0 - 18.4%
- 18.4 - 36.8%
- 36.8 - 55.2%
- 55.2 - 73.7%
- 73.7 - 92.1%

Equal Interval Classification

Data Source: ACS (American Community Survey)  
5-Year Estimates 2010-2014



0 0.1 0.2 mi

Sophia Zheng, DUSP 5/2022



Percent Asian Population in Chinatown, Manhattan by Census Tracts in 2019

Legend

- Open Land
- Open Water
- Chinatown, Manhattan

Percent Asian Population

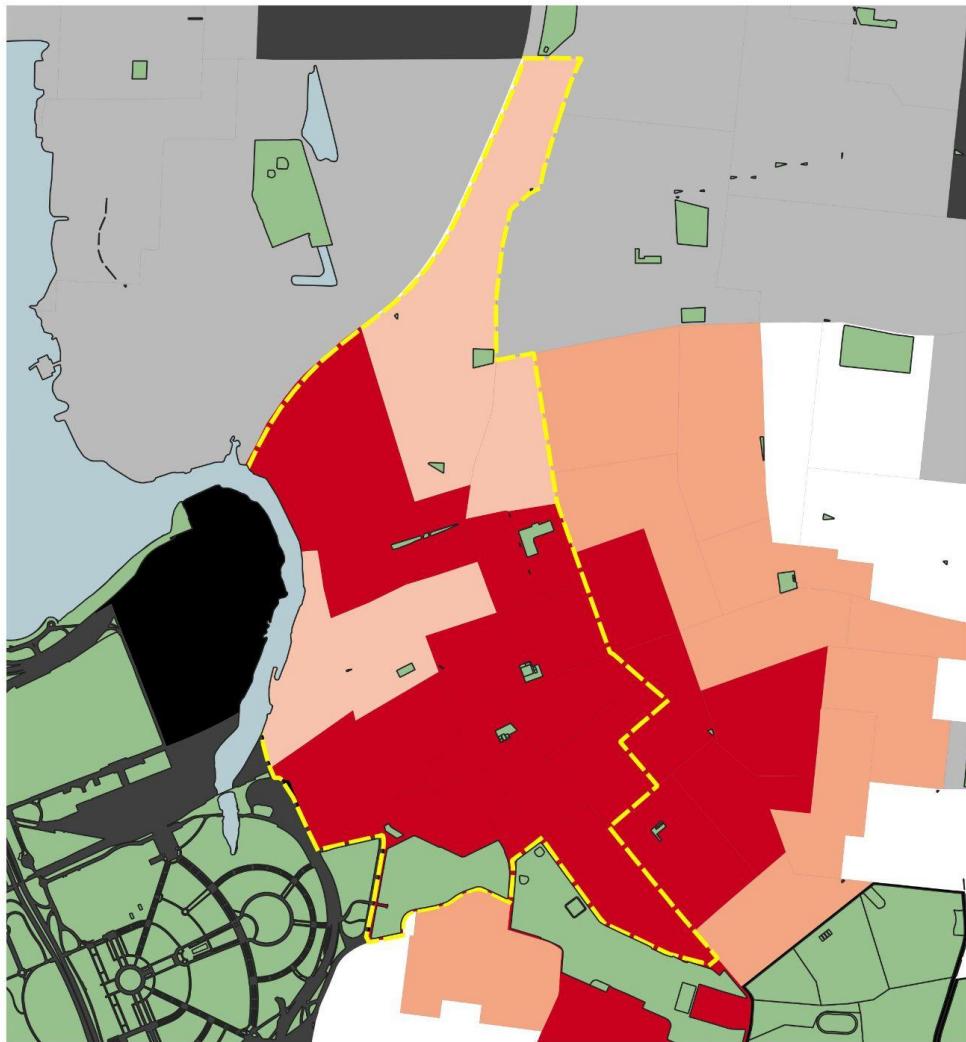
- Zero Population
- 0 - 18.4%
- 18.4 - 36.8%
- 36.8 - 55.2%
- 55.2 - 73.7%
- 73.7 - 100%

Equal Interval Classification

Data Source: ACS (American Community Survey)  
5-Year Estimates 2015-2019

0    0.1    0.2 mi  
A horizontal scale bar with three segments: a black segment labeled '0', a white segment labeled '0.1', and another black segment labeled '0.2 mi'.





Percent Asian Population in Flushing, Queens by Census Tracts in 2014

Legend

- Open Land
- Open Water
- Flushing, Queens

Percent Asian Population

- Zero Population
- 0 - 18.4%
- 18.4 - 36.8%
- 36.8 - 55.2%
- 55.2 - 73.7%
- 73.7 - 92.1%

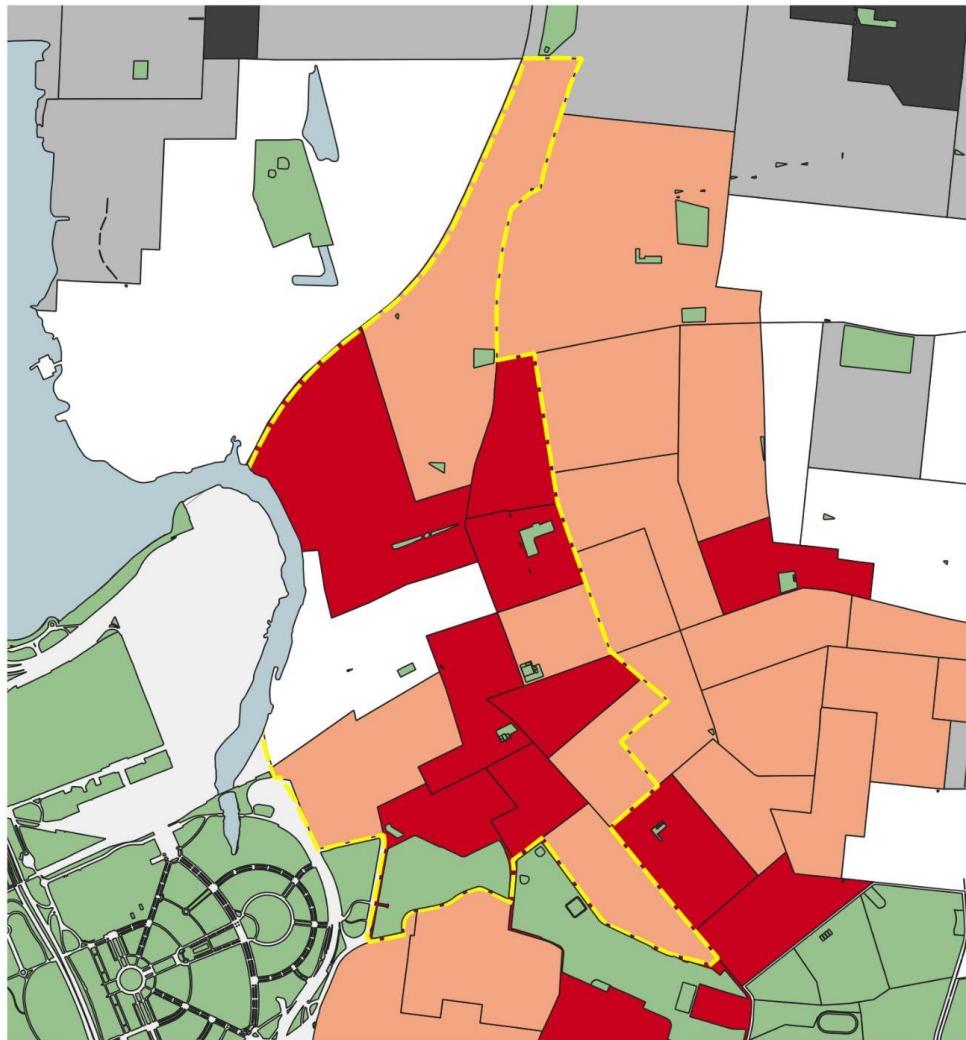
Equal Interval Classification

Data Source: ACS (American Community Survey)  
5-Year Estimates 2010-2014



0 0.25 0.5 mi

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## Percent Asian Population in Flushing, Queens by Census Tracts in 2019

### Legend

- Open Land
- Open Water
- Flushing, Queens

### Percent Asian Population

- Zero Population
- 0 - 18.4%
- 18.4 - 36.8%
- 36.8 - 55.2%
- 55.2 - 73.7%
- 73.7 - 100%

### Equal Interval Classification

Data Source: ACS (American Community Survey)  
5-Year Estimates 2015-2019

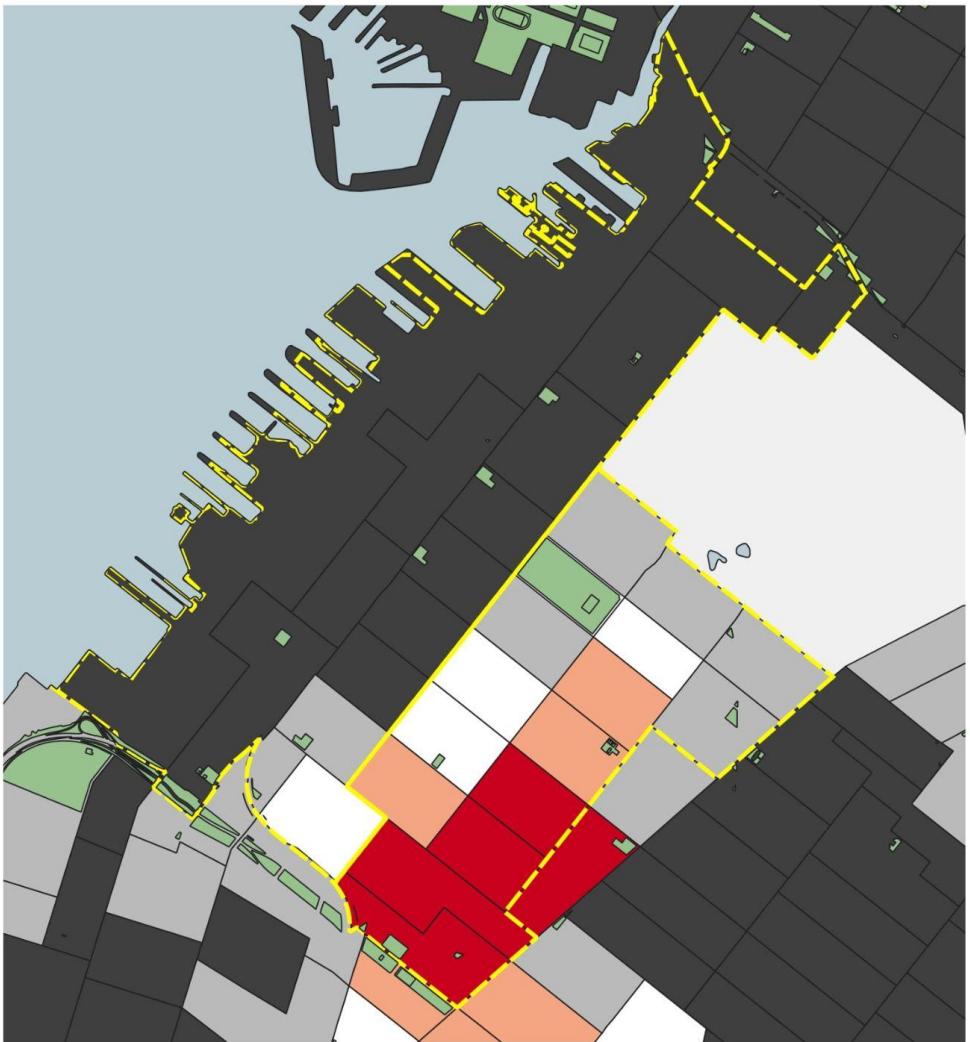


0 0.25 0.5 mi

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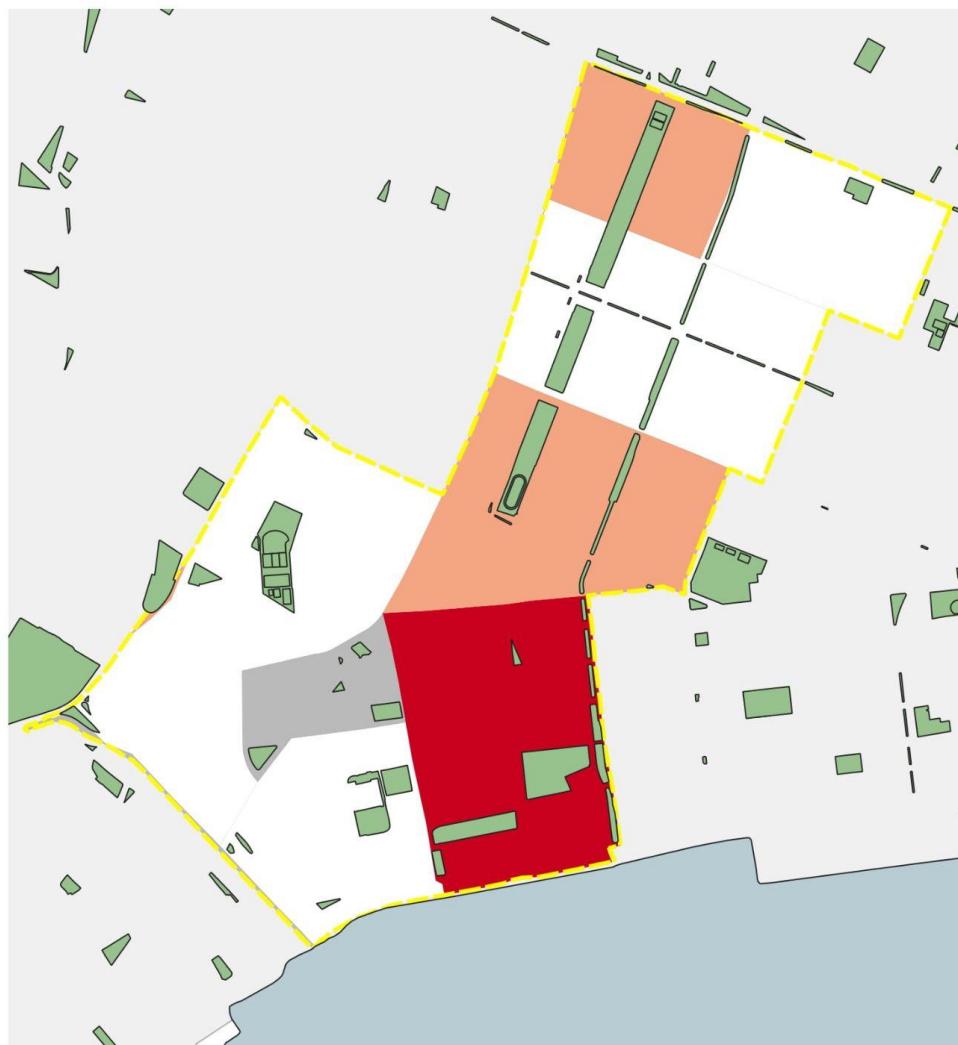


Percent Asian Population in Sunset Park, Brooklyn by Census Tracts in 2014



Percent Asian Population in Sunset Park, Brooklyn by Census Tracts in 2019





Percent Rent of Annual Income for the Asian Population in Chinatown, Manhattan by Census Tracts in 2014

Legend

- Open Land
- Open Water
- Chinatown, Manhattan

Percent Rent of Annual Income

- No Data
- 0 - 22.1%
- 22.1 - 32.2%
- 32.2 - 42.3%
- 42.3 - 50.2%
- 50.2 - 111.5%

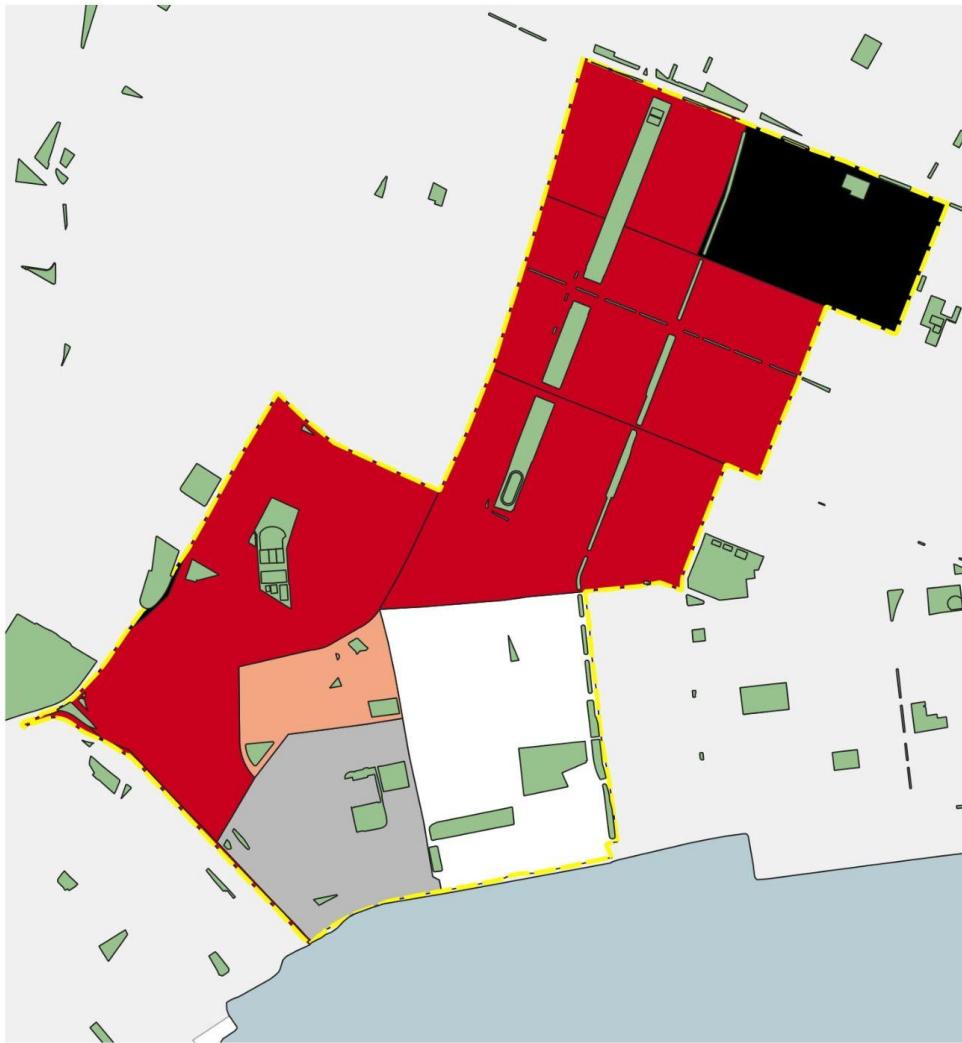
Equal Count (Quantile) Classification

Data Source: ACS (American Community Survey)  
5-Year Estimates 2010-2014

0 0.1 0.2 mi



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Percent Rent of Annual Income for the Asian Population in Chinatown, Manhattan by Census Tracts in 2019

Legend

- Open Land
- Open Water
- Chinatown, Manhattan

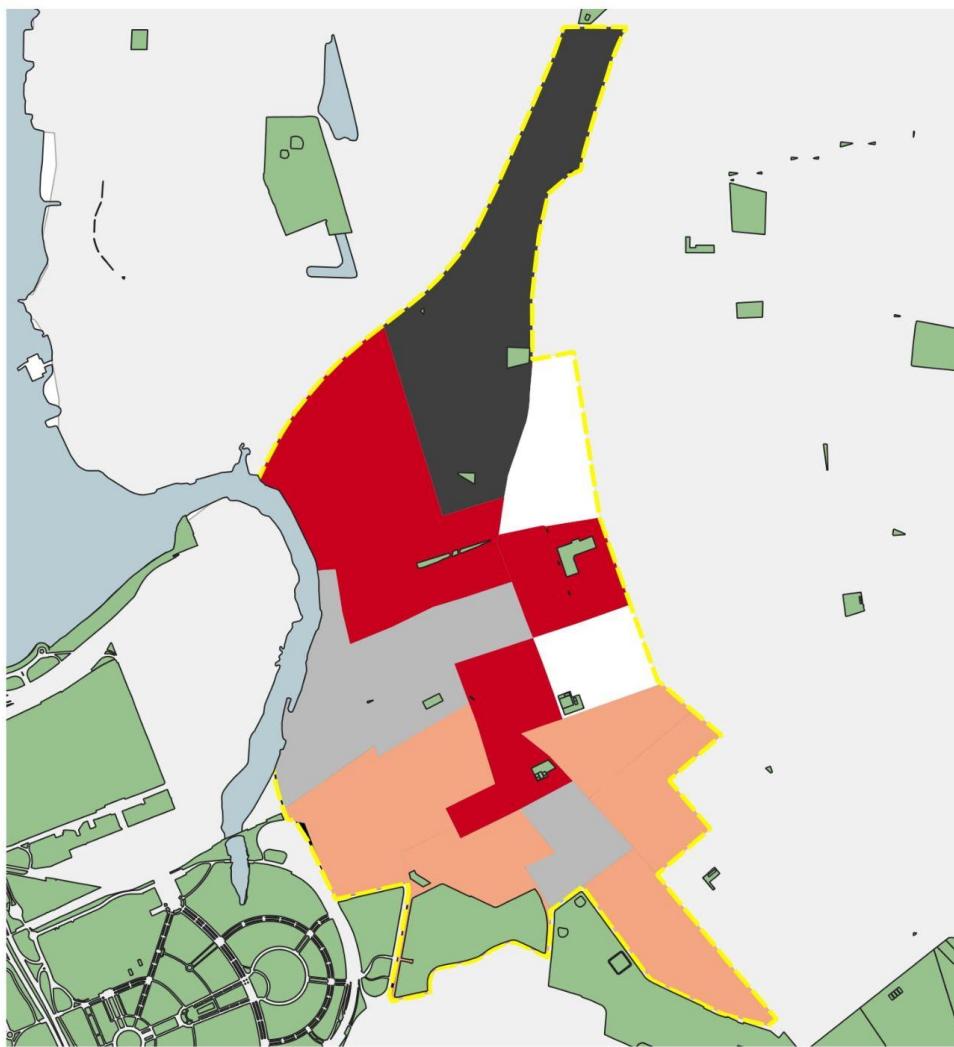
Percent Rent of Annual Income

- No Data
- 0 - 22.1%
- 22.1 - 32.2%
- 32.2 - 42.3%
- 42.3 - 50.2%
- 50.2 - 126.7%

Equal Count (Quantile) Classification

Data Source: ACS (American Community Survey)  
5-Year Estimates 2015-2019





Percent Rent of Annual Income for  
the Asian Population in Flushing,  
Queens by Census Tracts in 2014

Legend

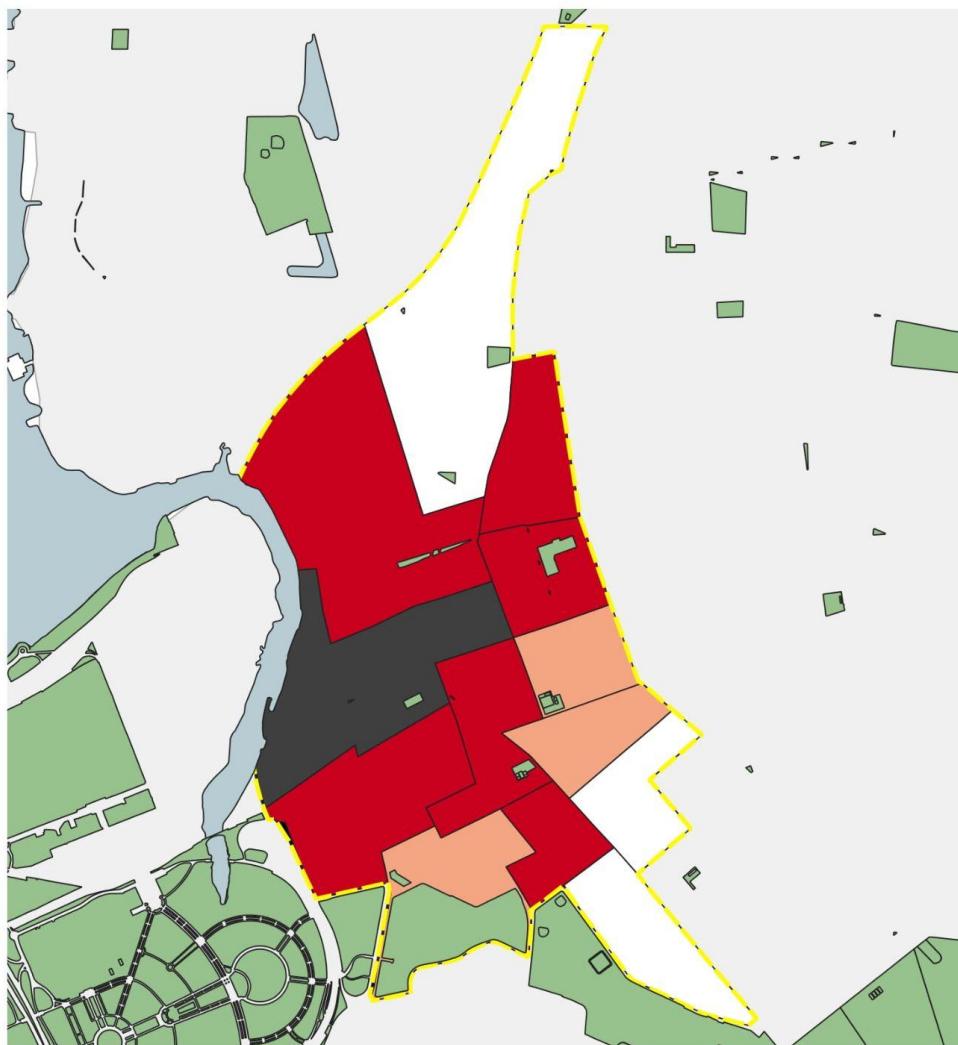
- Open Land
- Open Water
- Flushing, Queens

Percent Rent of Annual Income

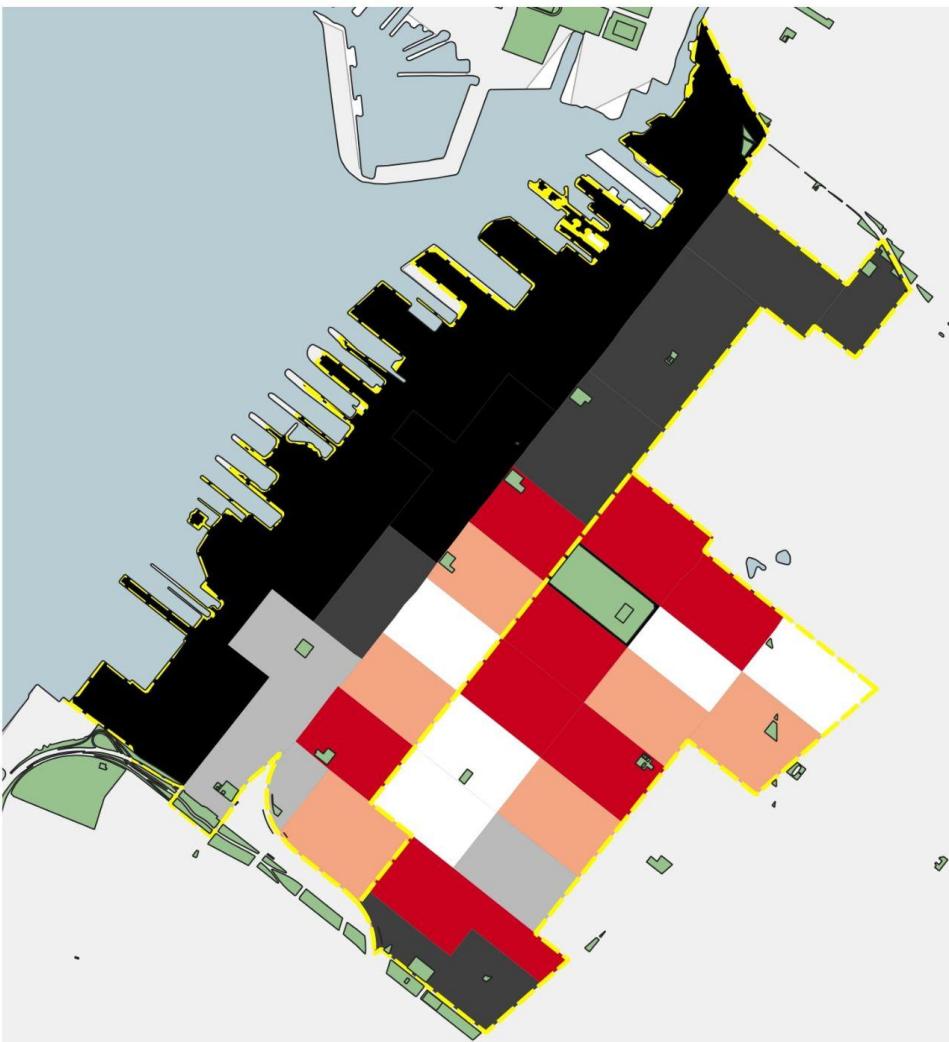
- No Data
- 0 - 22.1%
- 22.1 - 32.2%
- 32.2 - 42.3%
- 42.3 - 50.2%
- 50.2 - 111.5%

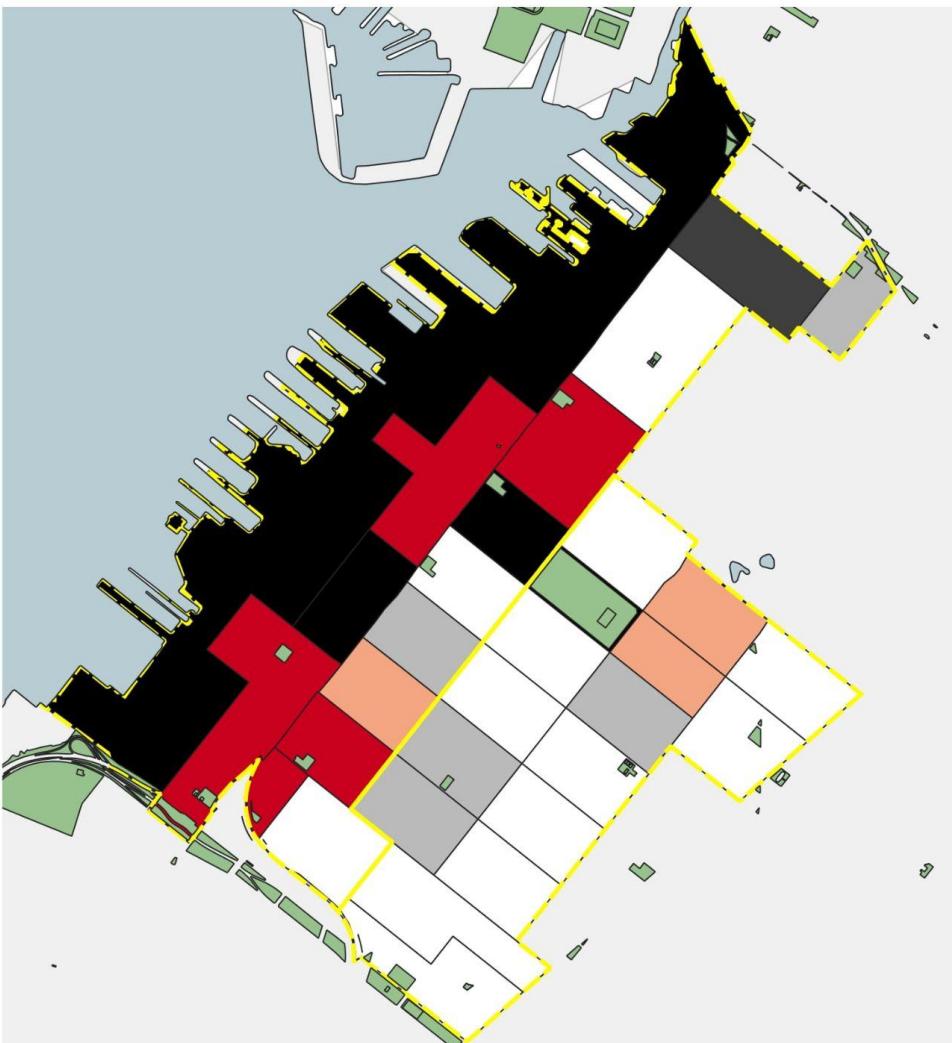
Equal Count (Quantile) Classification

Data Source: ACS (American Community Survey)  
5-Year Estimates 2010-2014



Percent Rent of Annual Income for the Asian Population in Flushing, Queens by Census Tracts in 2019





Percent Rent of Annual Income for the Asian Population in Sunset Park, Brooklyn by Census Tracts in 2014

Legend

- Open Land
- Open Water
- Sunset Park, Brooklyn

Percent Rent of Annual Income

- No Data
- 0 - 22.1%
- 22.1 - 32.2%
- 32.2 - 42.3%
- 42.3 - 50.2%
- 50.2 - 126.7%

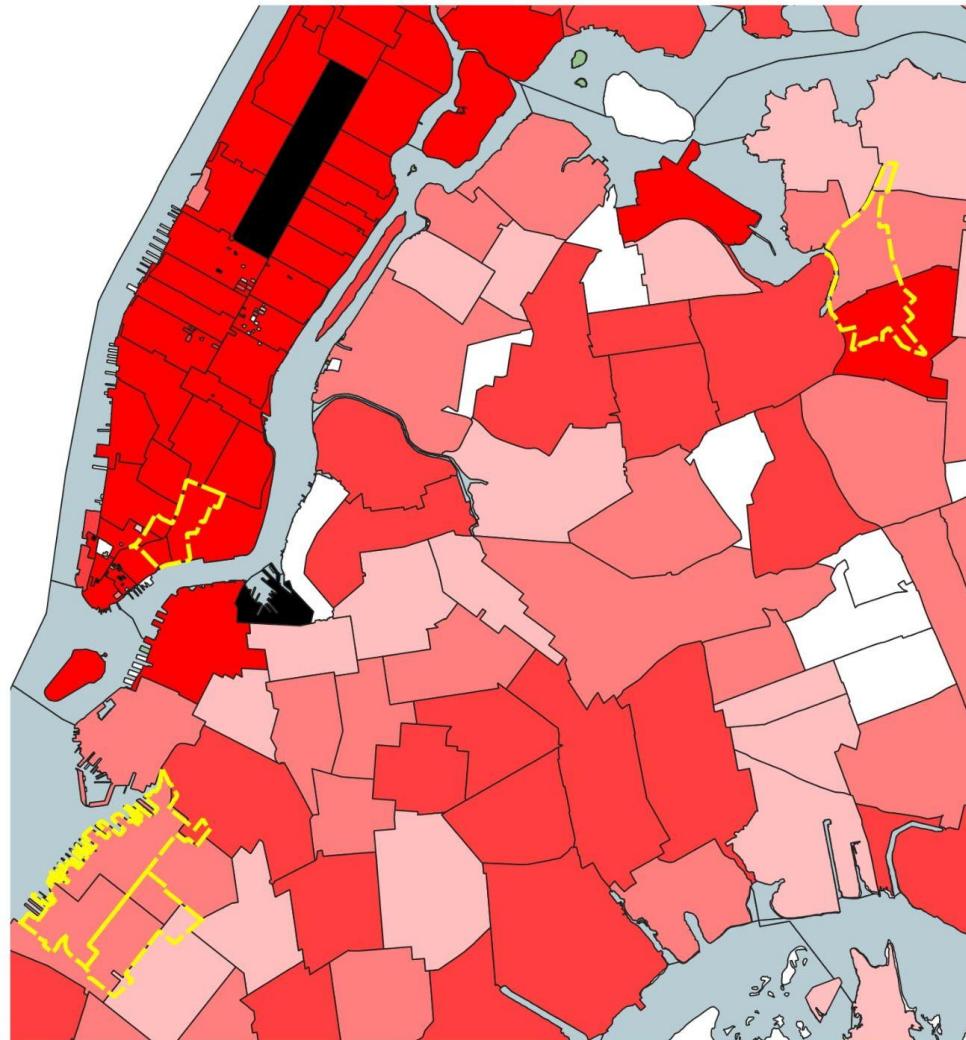
Equal Count (Quantile) Classification

Data Source: ACS (American Community Survey)  
5-Year Estimates 2015-2019

0 0.25 0.5 mi

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Number of Visits to Points of Interest in NYC by Zip Code Blocks in April 2019

Legend

- Chinese Ethnic Enclaves
- Open Land
- Open Water

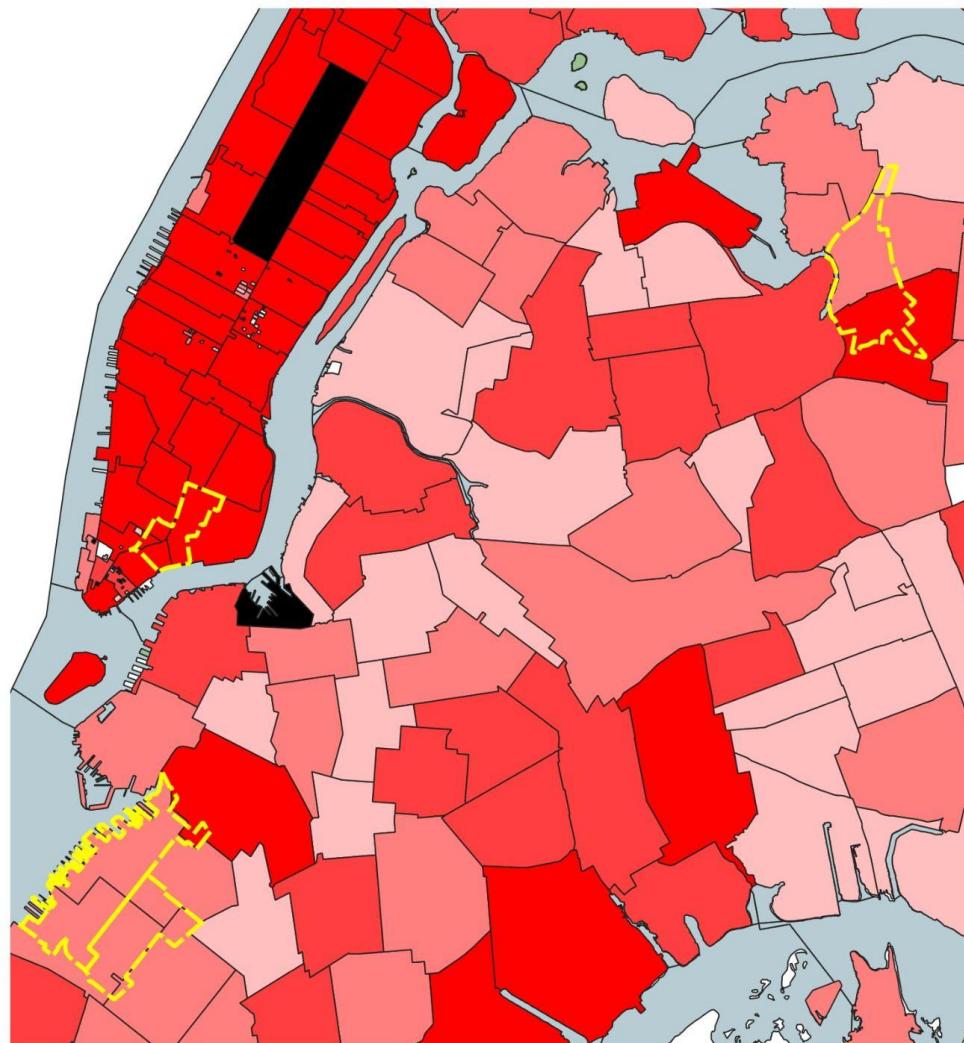
Number of Visits to Places of Interest

- No Data
- 0 - 2377
- 2377 - 6493
- 6493 - 14393
- 14393 - 55312
- 55312 - 858478

Equal Count (Quantile) Classification

Data Source: SafeGraph Patterns 2019 Data + NYC OpenData Zip Code Boundaries





Number of Visits to Points of Interest in NYC by Zip Code Blocks in April 2020

Legend

- Yellow dashed line: Neighborhoods
- Light grey: Open Land
- Medium grey: Open Water

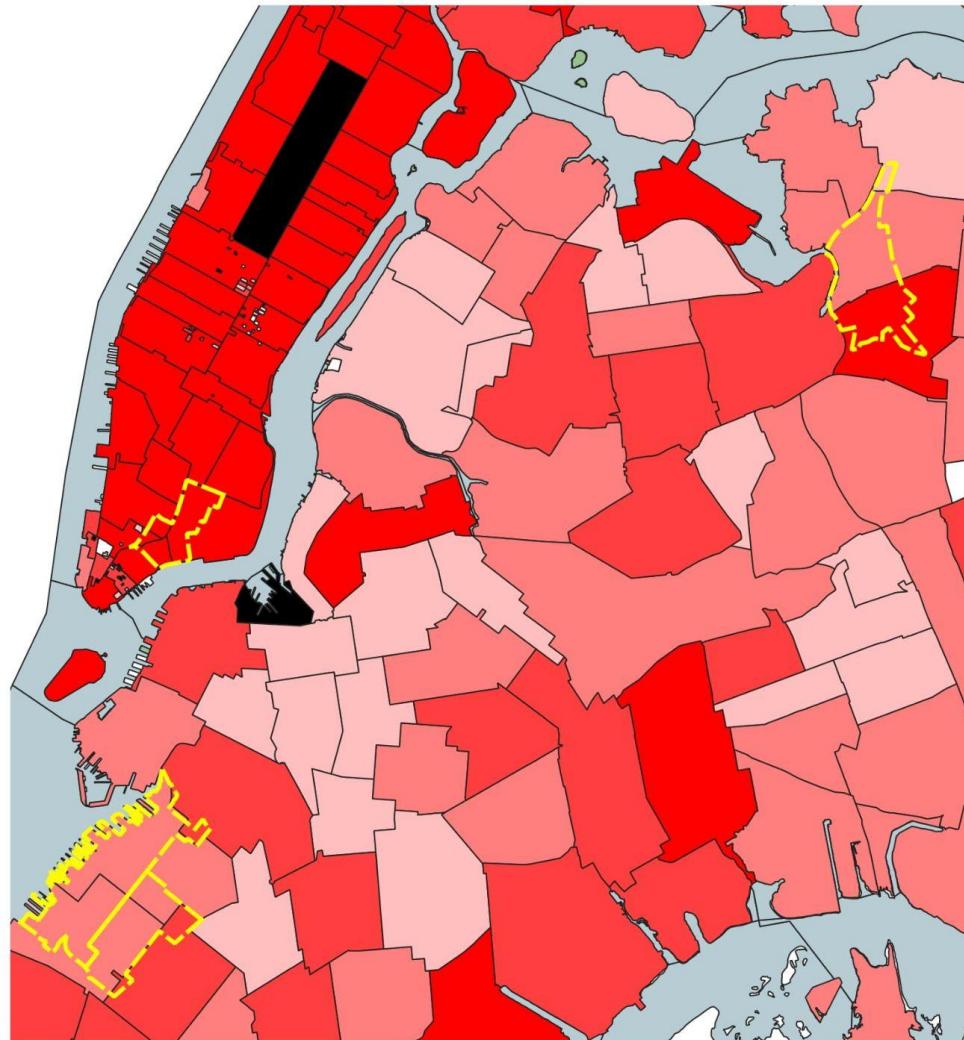
Number of Visits to Points of Interest

- Black: No Data
- White: 0 - 230
- Light pink: 230 - 1809
- Dark pink: 1809 - 4416
- Red: 4416 - 12661
- Bright red: 12661 - 102995

Equal Count (Quantile) Classification

Data Source: SafeGraph Patterns April 2020 Data + NYC OpenData Zip Code Boundaries

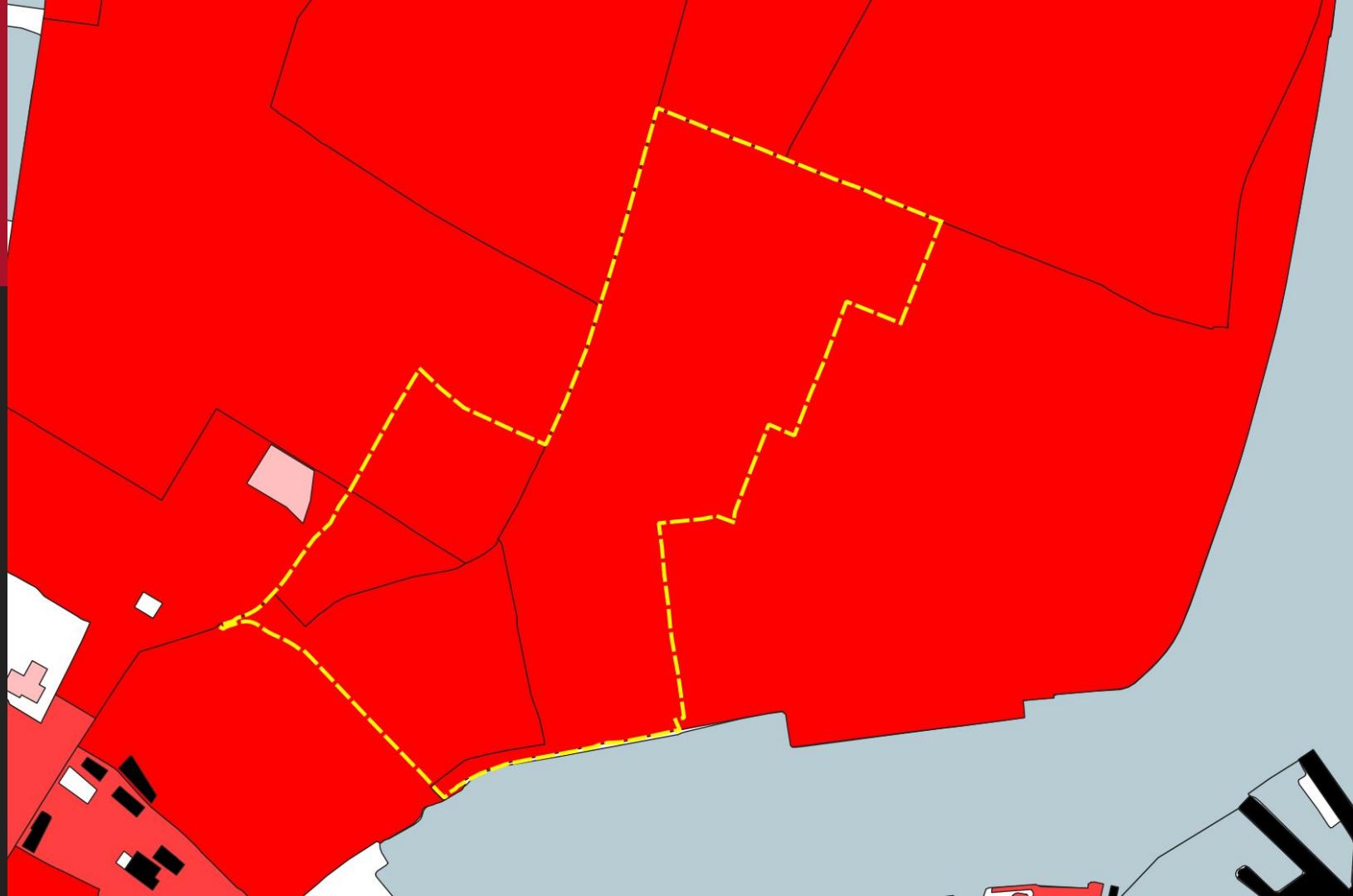




Number of Visits to Points of Interest in NYC by Zip Code Blocks in April 2021

Percent change = (new - old) / old \* 100

Region	2019-2020	2020-2021
<b>Chinatown</b>	-82.48%	76.52%
<b>Sunset Park</b>	-159.25%	66.32%
<b>Flushing</b>	-81.54%	124.05%
<b>Manhattan</b>	-85.19%	91.47%
<b>Brooklyn</b>	-65.28%	88.45%
<b>Queens</b>	-66.23%	69.76%



## Analysis

- Race outflow varies
- Income overall supportive (Flushing a bit unclear)
- More business decreases in the enclaves with Chinatown outlier

## Applications

- Housing stability
- How to deal with inflow/outflow of population
- More aid is needed for these businesses who could have been disproportionately affected by the Covid-19 pandemic

## Limitations

- Only compared two 5 year differences / a three year period of points of interest
- Look at demographic changes of other races to ensure it is check specificity
- Difficulty of spatial joining of Safegraph data (geocoding limitations)
- Boundary definitions

## Future Research

- More long-term, temporal analysis
- Geocode addresses to gain more specificity in spatial patterns
- Greater analysis to claim statistical significance/identify correlation
- Chinese ethnic enclaves in other states/regions

# Bibliography

1. [NYT: Manhattan's Chinese Street Signs Are Disappearing](#)
2. [Chinatown Rethinks Walkable Neighborhoods](#)
3. [Columbia Political Review: Cultural Displacement: Gentrification in New York City's Chinatown](#)
4. [AsAm News: Asian population declines in Manhattan's Chinatown](#)
5. [Vox: Will luxury towers edge out the last of the working-class Chinese in New York's iconic Chinatown?](#)
6. [WTHR: New York City's Chinatown fighting back against declining population and pandemic pressure](#)
7. [Chinatown Losing Its Chinese Edge To Sunset Park, Flushing](#)
8. [Inside Sunset Park, the city's largest \(and growing\) Chinatown](#)
9. [Chinatowns are struggling to survive. Grace Young is reminding Americans why they matter.](#)
10. [Covid-19: Chinatowns fighting racism and pandemic to survive](#)
11. [Measuring and mapping displacement: The problem of quantification in the battle against gentrification](#)
12. [Identifying Gentrification with GIS: Spatial Correlation between Race, Income, and Education](#)
13. [Trump's 'Chinese Virus' Tweet Linked to Rise of Anti-Asian Hashtags on Twitter](#)
14. [Trump Once Again Calls Covid-19 Coronavirus The 'Kung Flu'](#)