

# Understanding the Relationship between Population and Crime in Utah



SOCIO

# Conclusions from Literature Review

- Crime rates are influenced more by population composition (e.g., age, economic status) than growth.
- Economic conditions, opportunity (influenced by urban layout and policing), thoughtful urban design, and zoning policies all play a role in crime rates.
- National trends may not apply to Utah due to its unique socio-cultural and economic factors (e.g., high religiosity, economic mobility, social cohesion).

# Sample Description

- The ACS data provides an assessment of the relative risk of seven major crime types at the census block group level.
- The data contain standardized indices for crime types which were derived from what ACS describes as “an extensive analysis of several years of crime reports from the vast majority of law enforcement jurisdictions nationwide”.
- Our analysis focused mostly on the Total Crime Index as an approximation of the level of criminal activity for a census block.
  - See <https://appliedgeographic.com/crimerisk/> for more details.
- The dataset also contains estimates capturing economic conditions (median household income, poverty rate, housing cost burden), demographic characteristics (racial diversity, age distribution, educational attainment), housing and infrastructure variables (units in large buildings, age of housing stock), and access-related metrics (distance to nearest highway, urban density). All observations are geospatially tagged and span 2,020 block groups across the state of Utah, which allowed us to conduct a fine-grained spatial and statistical analysis.

# ARC GIS Correlations

- We created interactive maps that show the association between two measures—crime and population density throughout the state of Utah.
  - Our mapping can isolate areas with high density and low crime, high density and high crime, low density and low crime, and low density and high crime.
- We created 6 interactive maps by census block groups with various associations between population measures and crime measures for exploration.
  - These are correlations between two variables and do not account for other factors that may better explain the relationship (most importantly, the % of renters).

2024 Population Density and Total Crime Rate Map

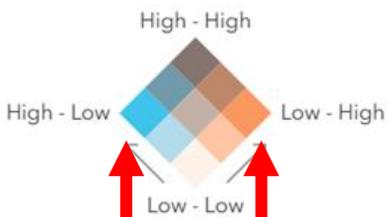
Sign In

Legend

Crime Data

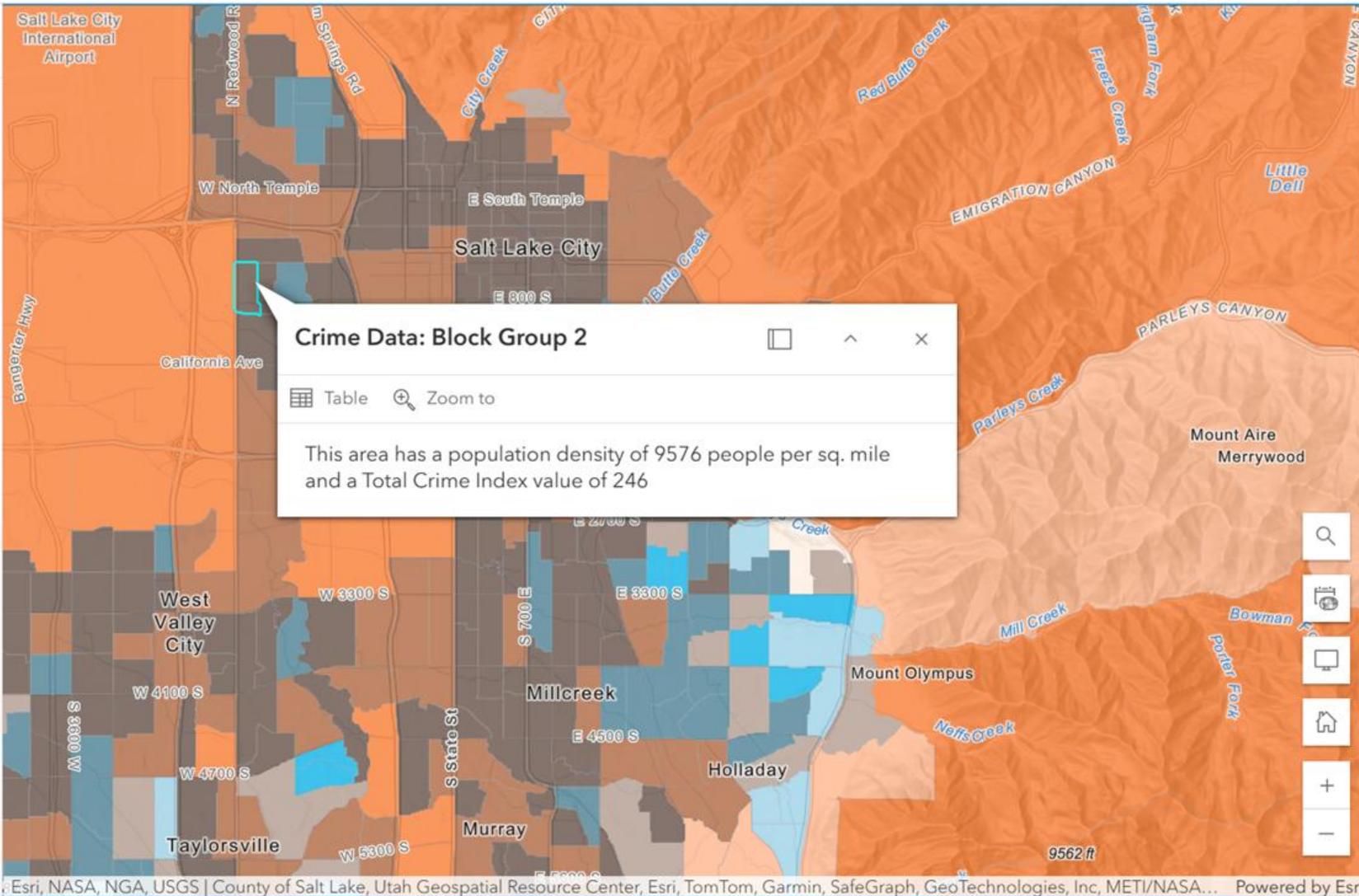
Relationship

- ↖ 2024 Population Density
- ↗ 2024 Total Crime Index



Good:  
High  
Density,  
Low Crime

Bad:  
Low  
Density,  
High  
Crime



**Crime Data: Block Group 2**

Table Zoom to

This area has a population density of 9576 people per sq. mile and a Total Crime Index value of 246

# Findings

2024 population density and total crime rate

- <https://byu.maps.arcgis.com/apps/mapviewer/index.html?webmap=1d9a07dd517c4e55bc08194559d110e6>

2024 population density and personal crime rate

- <https://www.arcgis.com/apps/mapviewer/index.html?webmap=7376c13b723d442888ac8defbd3946a1>

2024 population density and property crime rate

- <https://byu.maps.arcgis.com/apps/mapviewer/index.html?webmap=1be22fde2f41405a99d24a63c13964c0>

2024-2029 population growth projections and total crime index

- <https://experience.arcgis.com/experience/40850e6a601140ed93fc5f51fd8fd96e>

2024-2029 population growth projections and personal crime rate

- <https://byu.maps.arcgis.com/apps/mapviewer/index.html?webmap=d9e31e76cbad4c91b06a050705ea99e5>

2024-2029 population growth projections and property crime rate

- <https://byu.maps.arcgis.com/apps/mapviewer/index.html?webmap=58fa821ceecf4498a5ddcc89e3942b1c>

# Regression Results

- More expensive housing areas are associated with lower crime levels.
- Higher density is modestly linked to lower crime.
- A 1% increase in renter population is associated with a ~0.33% increase in the Total Crime Index.
- Areas with higher overall population tend to have lower crime levels, holding other factors constant.
- A 1% increase in Multi-Unit Housing (10+) or apartment buildings is associated with a 0.03% increase in the Total Crime Index

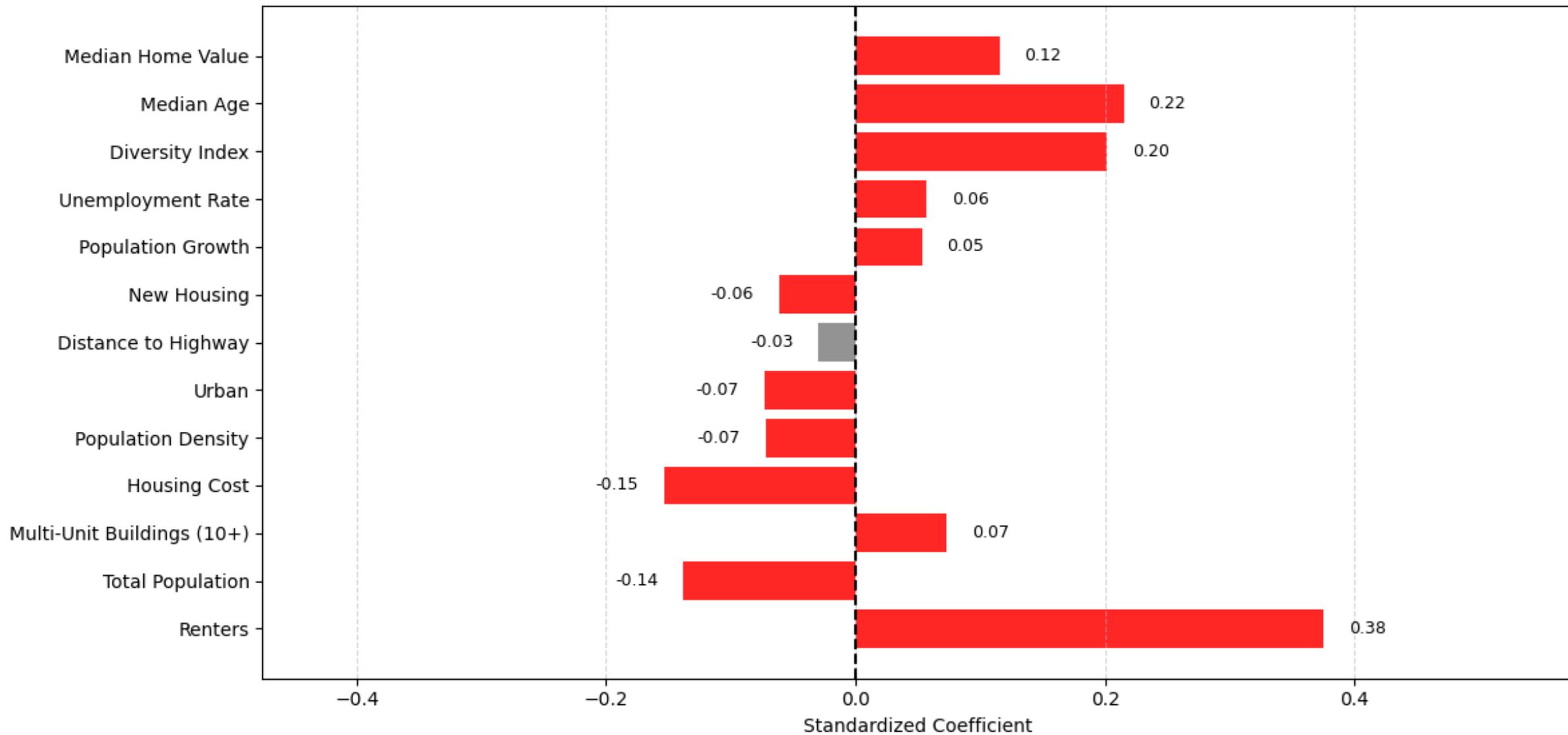
## Regression Results

Dependent variable: *Y\_log\_Total\_Crime\_Index*

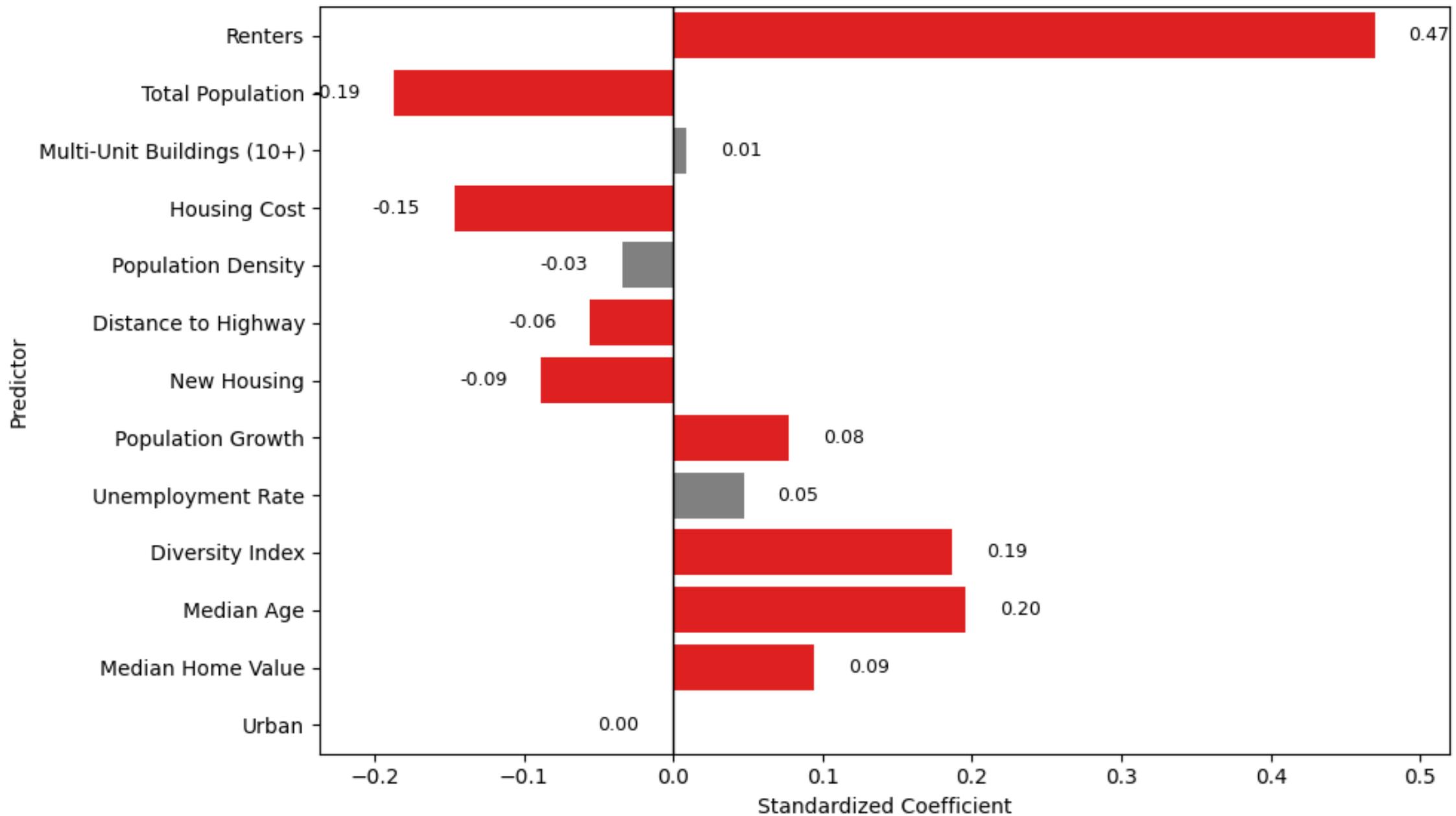
	(1)
Diversity Index	0.010*** (0.001)
Intercept	4.823*** (0.446)
Median Age	0.032*** (0.004)
Median Home Value	0.000*** (0.000)
Per 1% Increase in Distance to Highway	-0.026* (0.015)
Per 1% Increase in Housing Cost	-0.186*** (0.039)
Per 1% Increase in Population Density	-0.040*** (0.013)
Per 1% Increase in Renters	0.331*** (0.029)
Per 1% Increase in Total Population	-0.332*** (0.076)
Per 1% Increase in Units in Large Buildings	0.032*** (0.011)
Urban Indicator (0/1)	-0.149*** (0.044)
√New Housing Units	-0.010*** (0.004)
√Population Growth	0.093*** (0.033)
√Unemployment Rate	0.057*** (0.016)
Observations	2019
R <sup>2</sup>	0.387
Adjusted R <sup>2</sup>	0.383
Residual Std. Error	0.737 (df=2005)
F Statistic	81.537*** (df=13; 2005)

Note: \* p<0.1; \*\* p<0.05; \*\*\* p<0.01

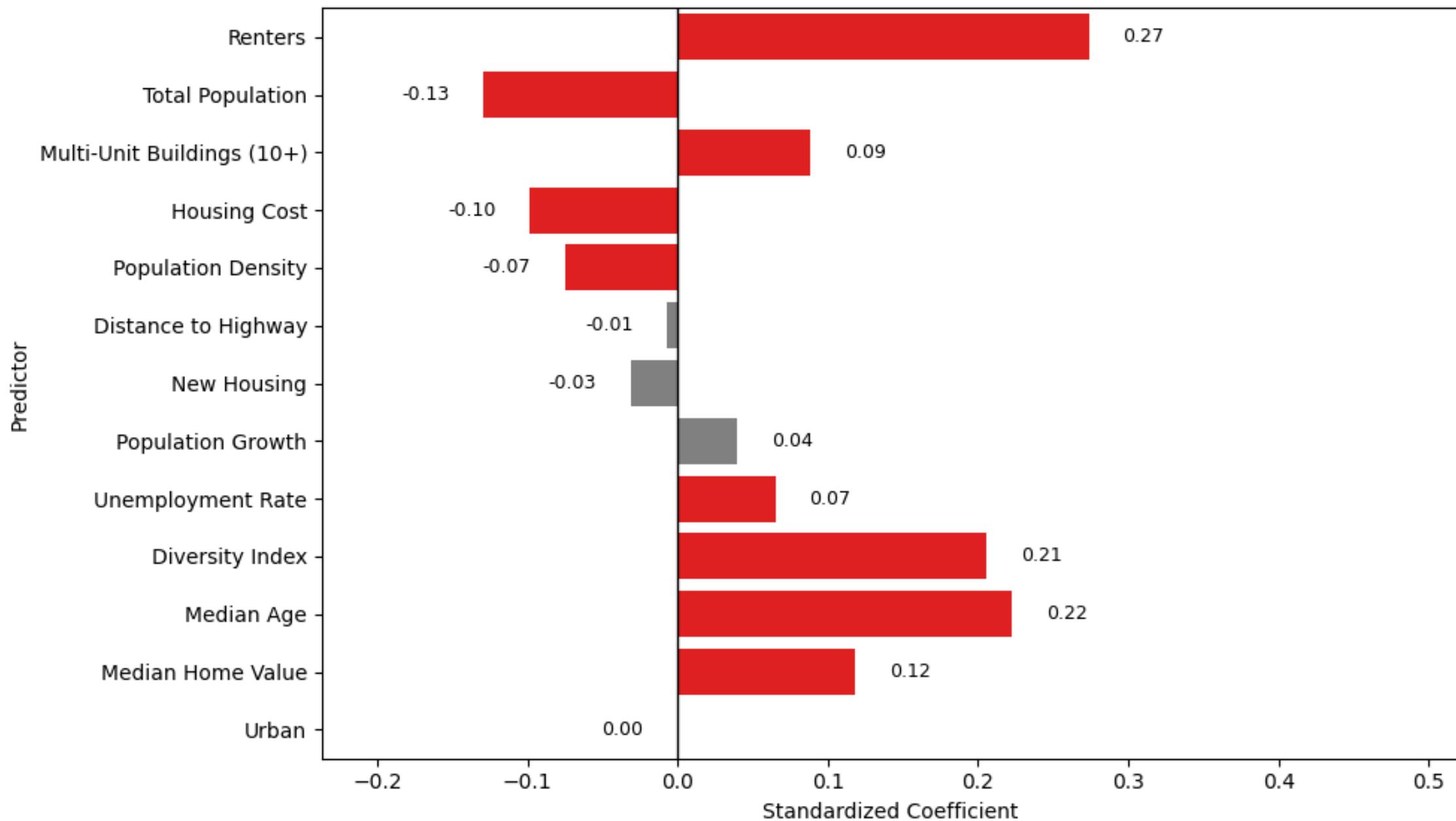
OLS Coefficients (Standardized Predictors)



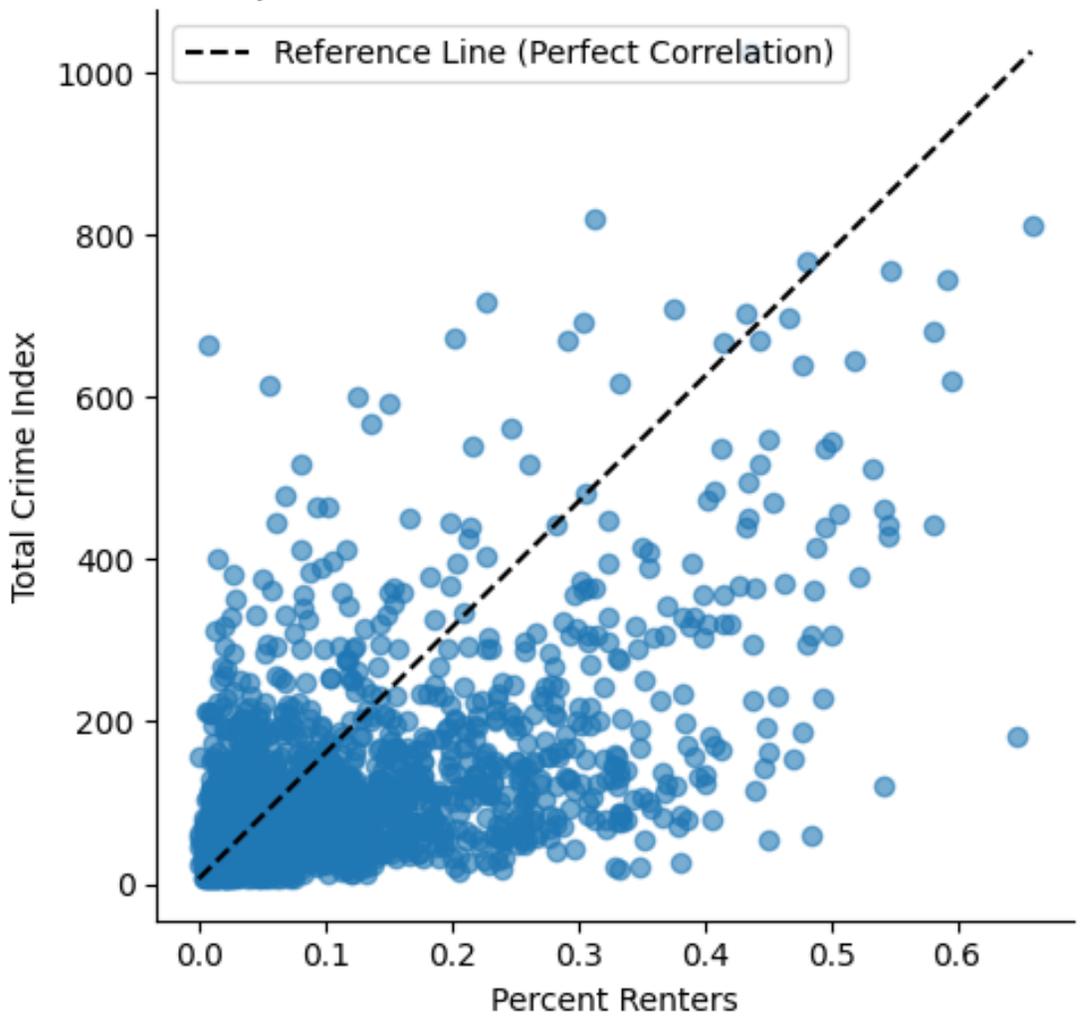
### Urban Model Coefficients



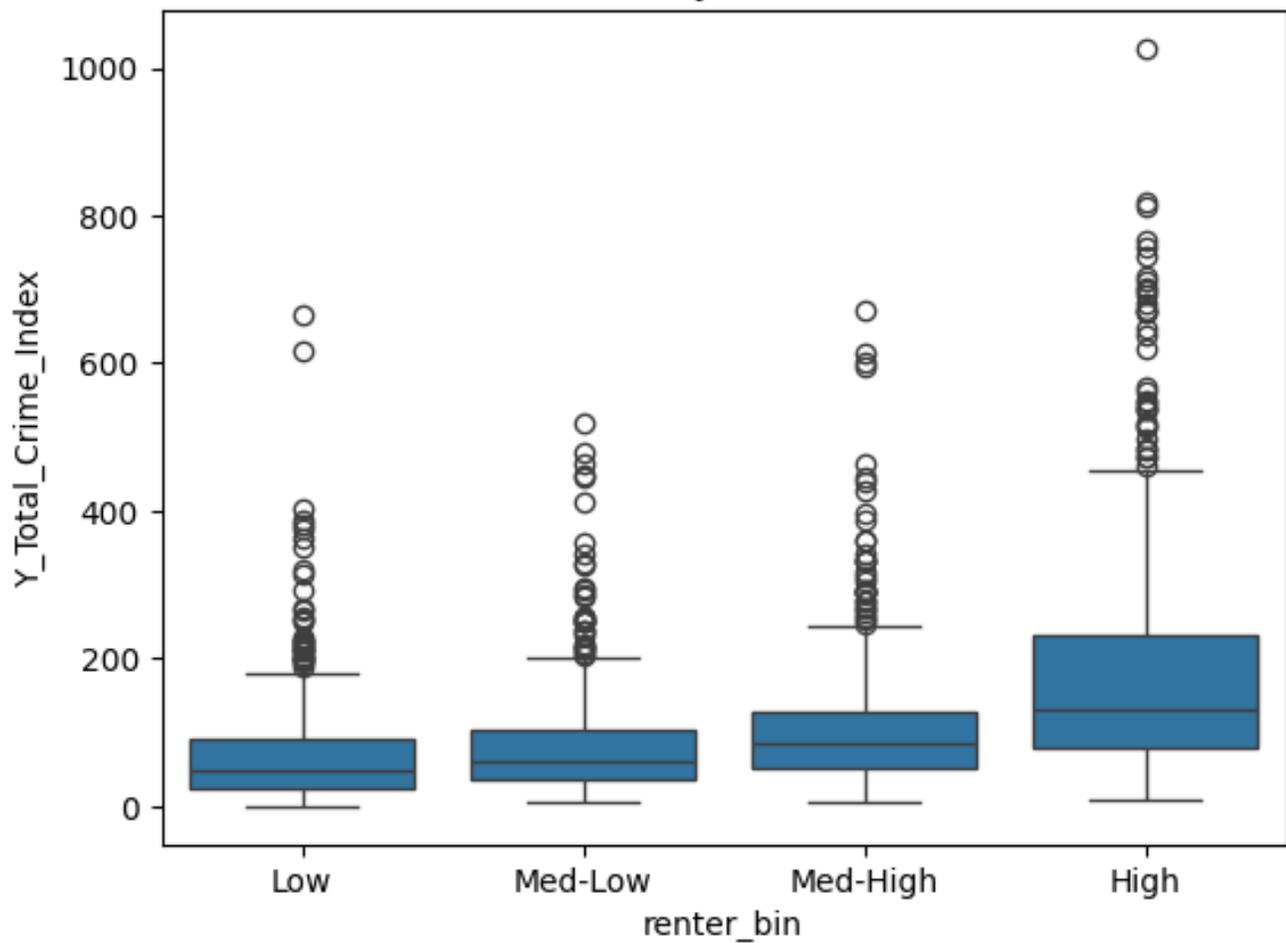
### Non-Urban Model Coefficients



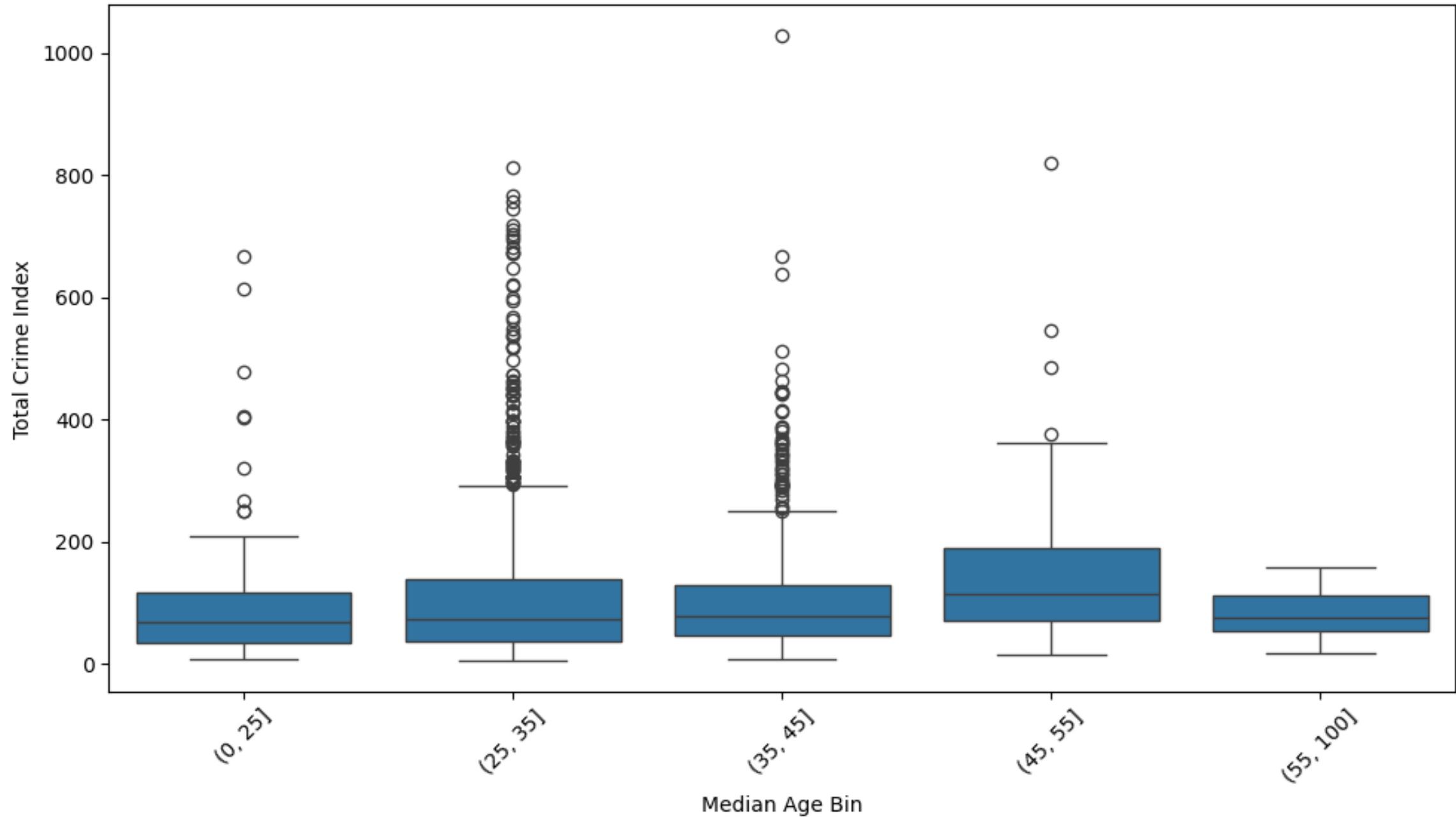
Relationship between Percent Renters and Total Crime Index



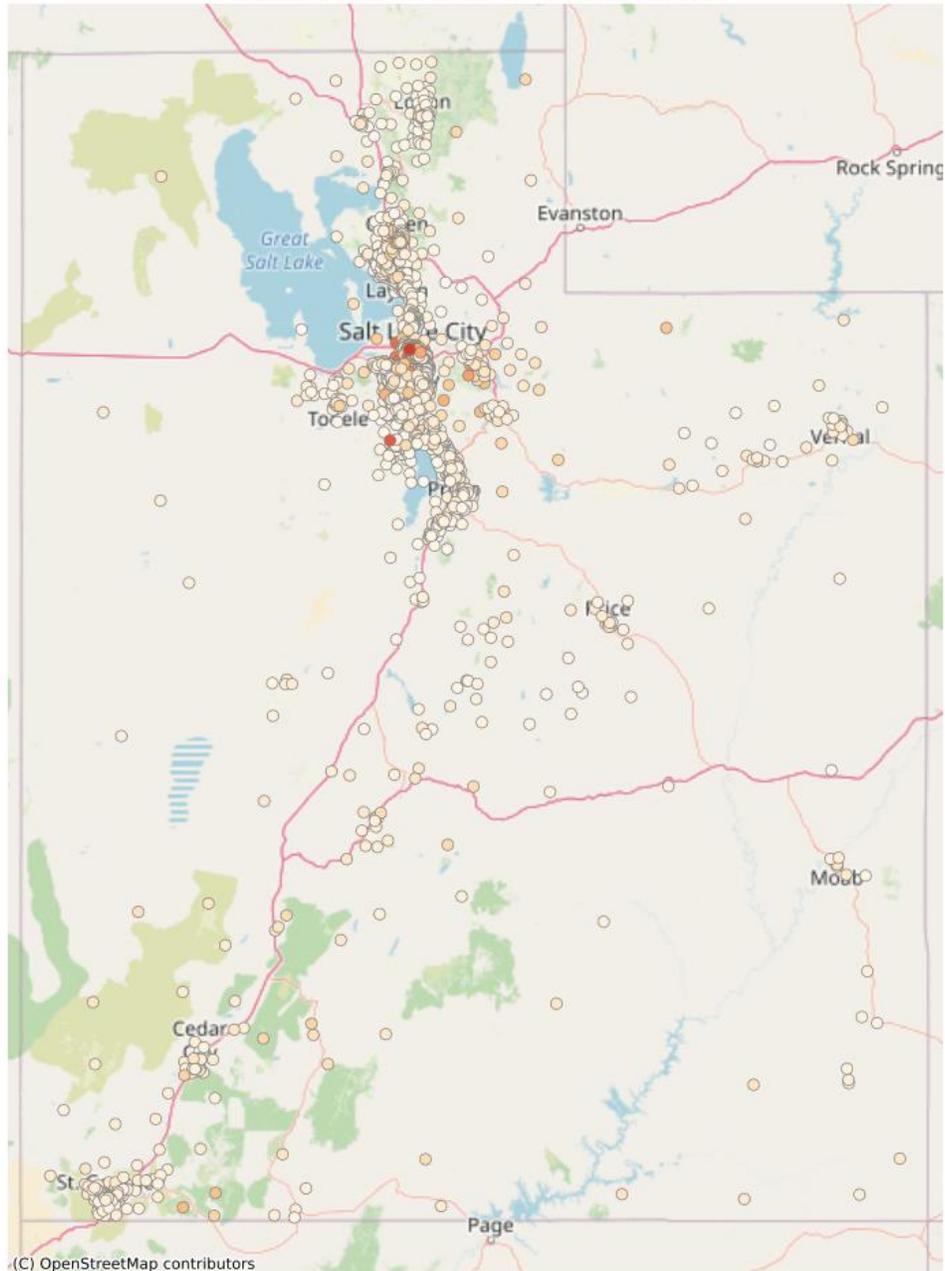
Crime Index by Renter Quartile



Crime Index Distribution by Median Age Bracket

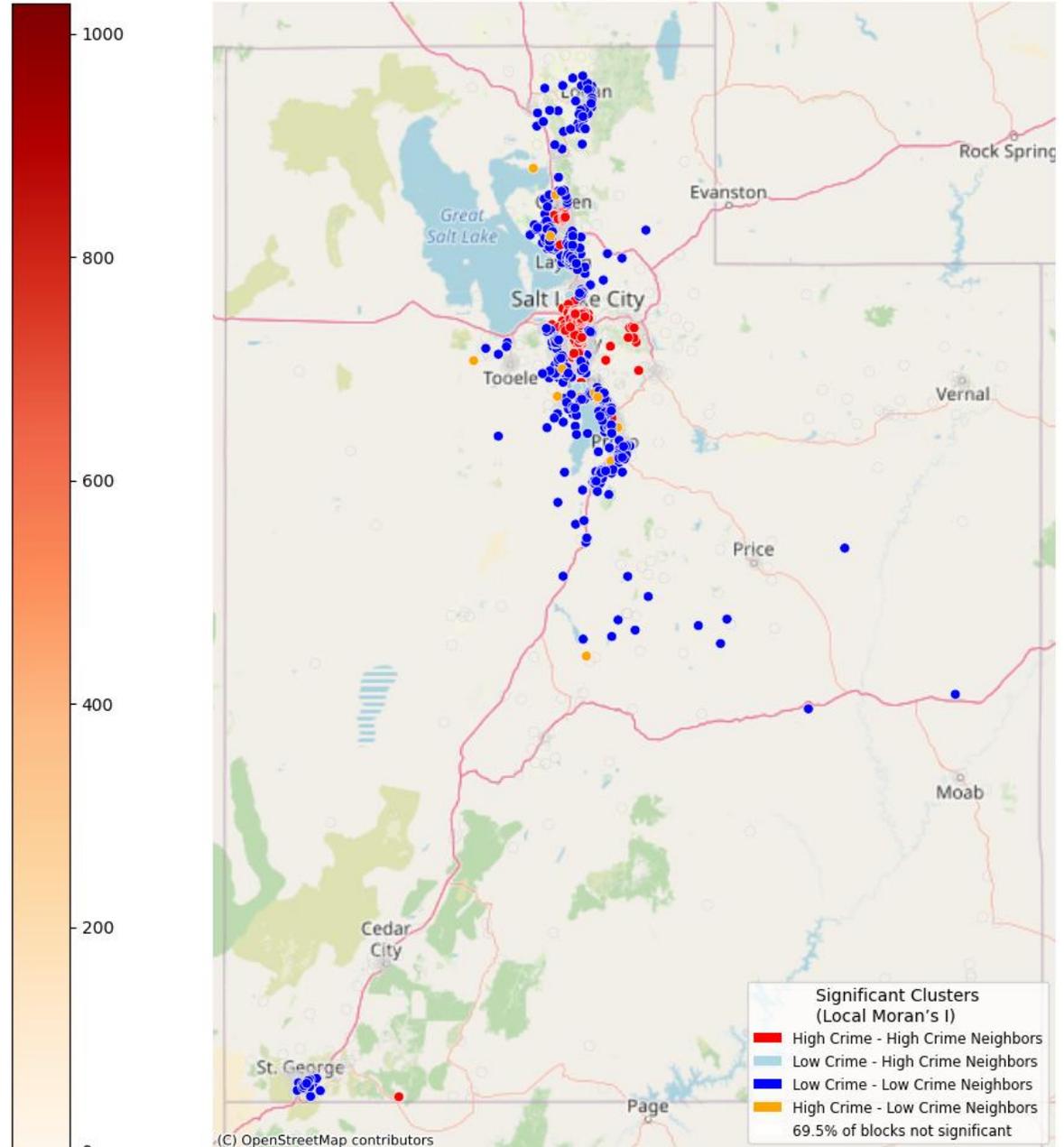


Total Crime Index by Block Group



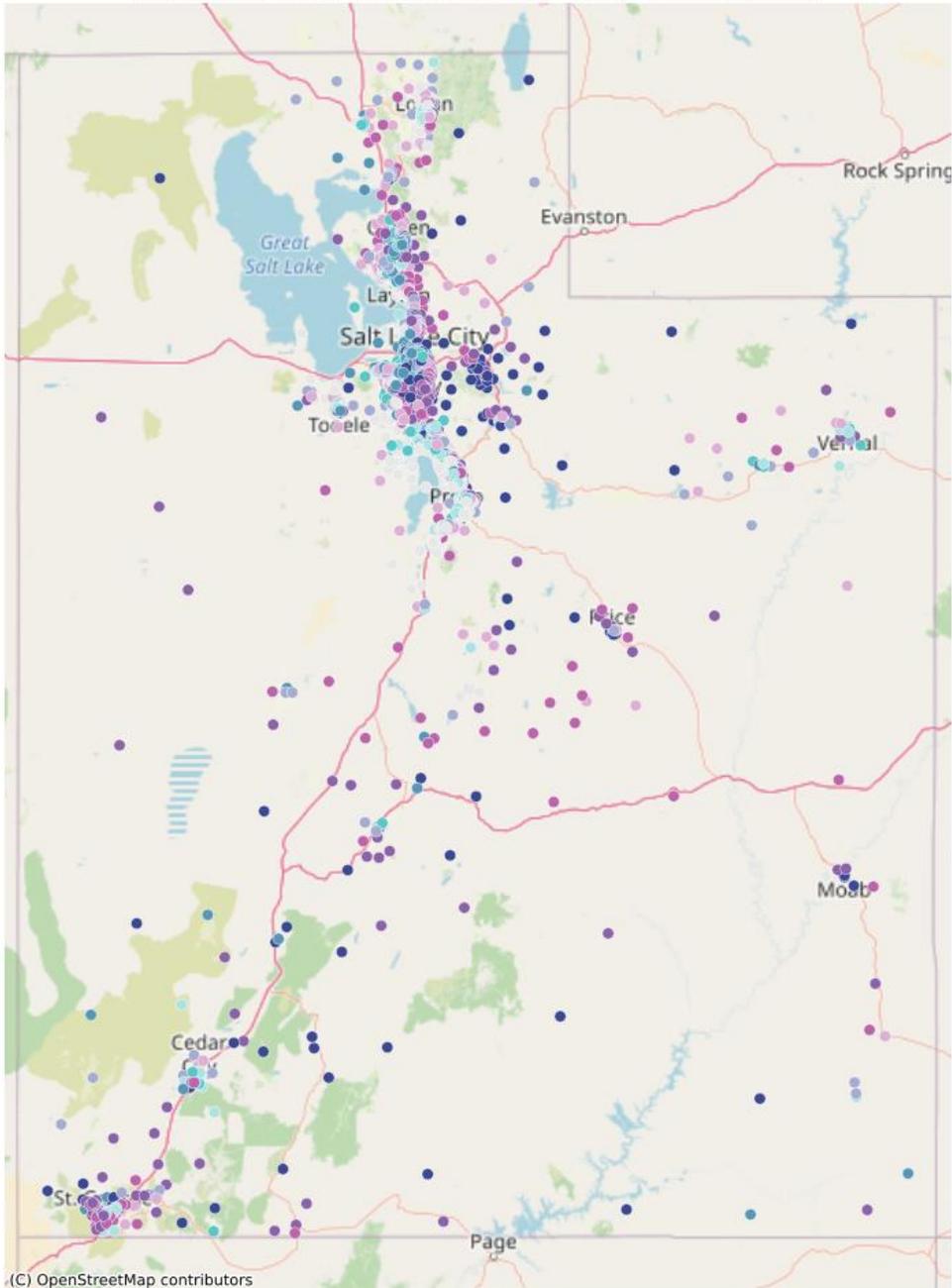
(C) OpenStreetMap contributors

Local Moran's I Significant Crime Clusters



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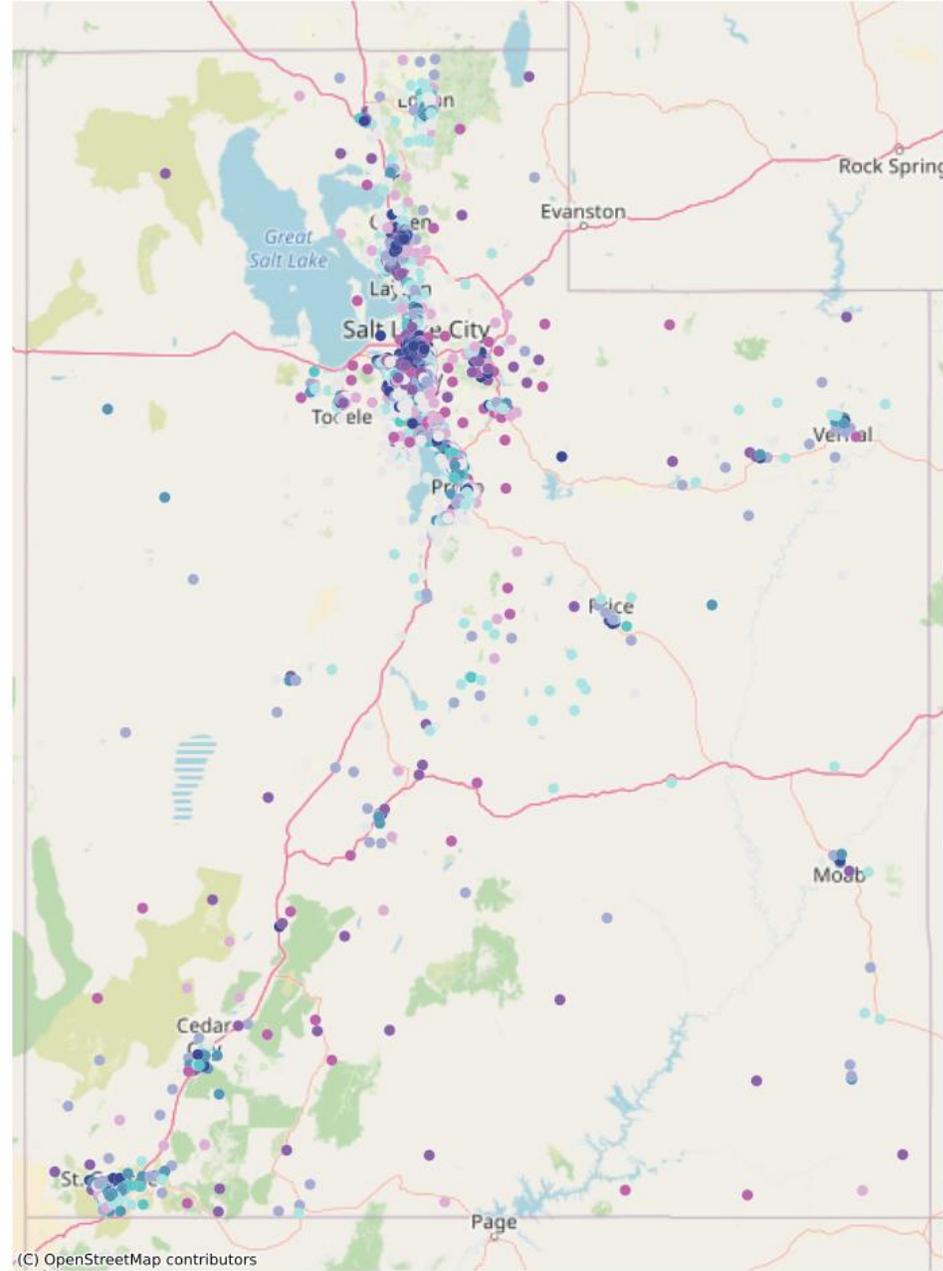
Bivariate Map: Median Age vs Total Crime Index



**Bivariate Legend**

Lightest color	Age: Low, Crime: Low
Light green	Age: Low, Crime: Mid
Light blue	Age: Low, Crime: High
Light purple	Age: Mid, Crime: Low
Light blue-gray	Age: Mid, Crime: Mid
Light teal	Age: Mid, Crime: High
Light pink	Age: High, Crime: Low
Light purple	Age: High, Crime: Mid
Dark purple	Age: High, Crime: High

Crime vs Renters: Bivariate Choropleth



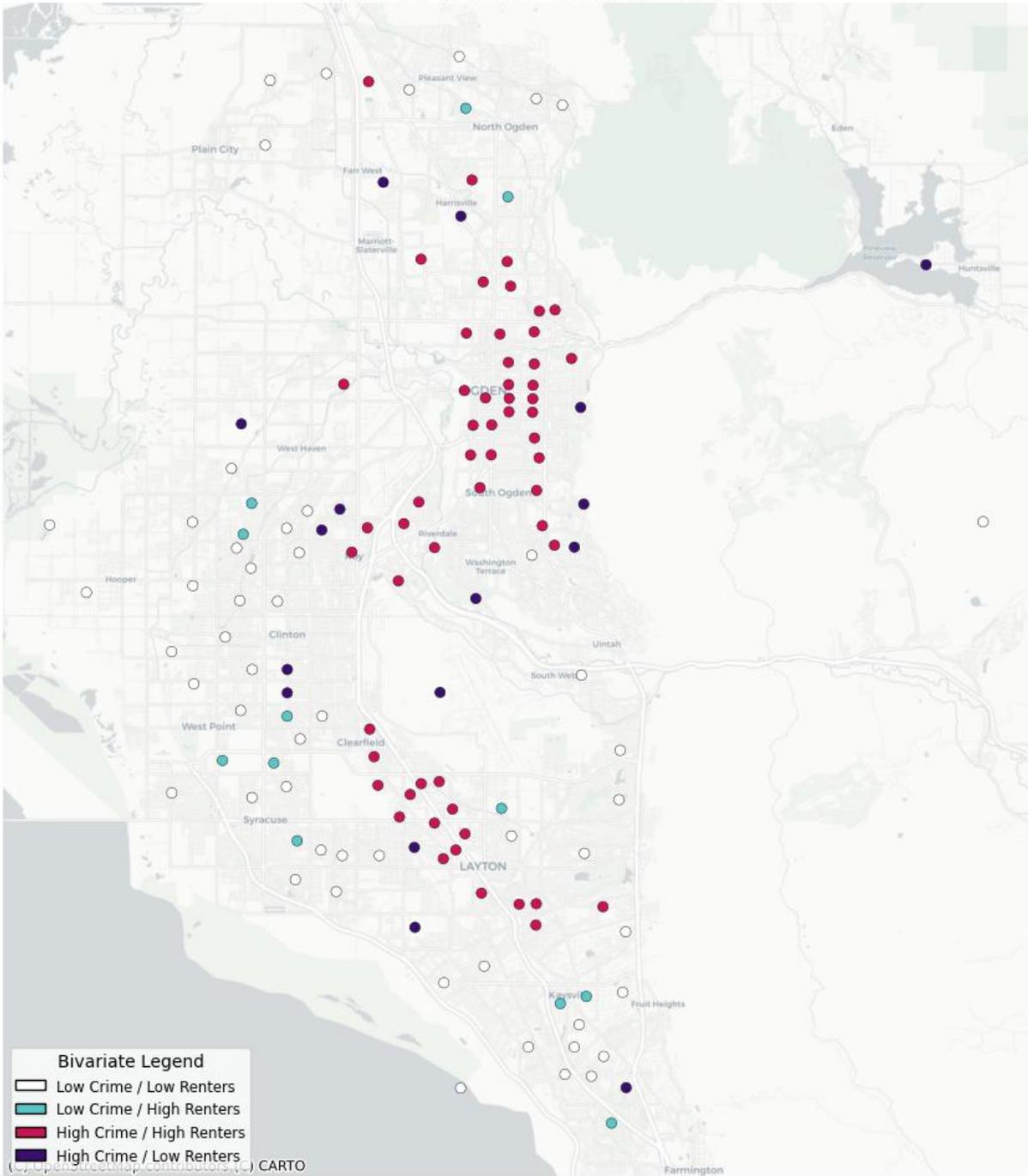
**Bivariate Legend**

Lightest color	Crime: Low, Renters: Low
Light green	Crime: Low, Renters: Med
Light blue	Crime: Low, Renters: High
Light purple	Crime: Med, Renters: Low
Light blue-gray	Crime: Med, Renters: Med
Light teal	Crime: Med, Renters: High
Light pink	Crime: High, Renters: Low
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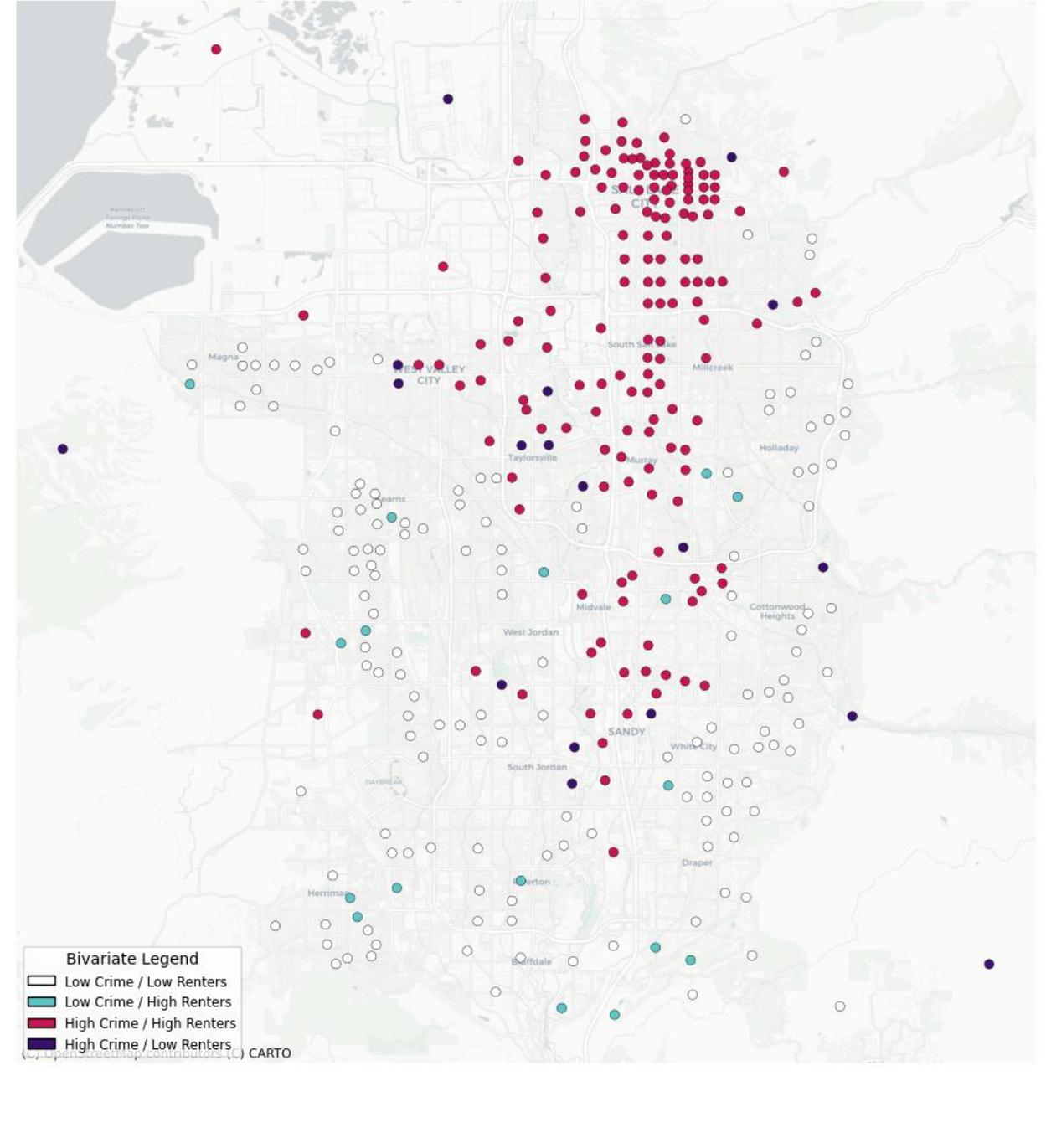
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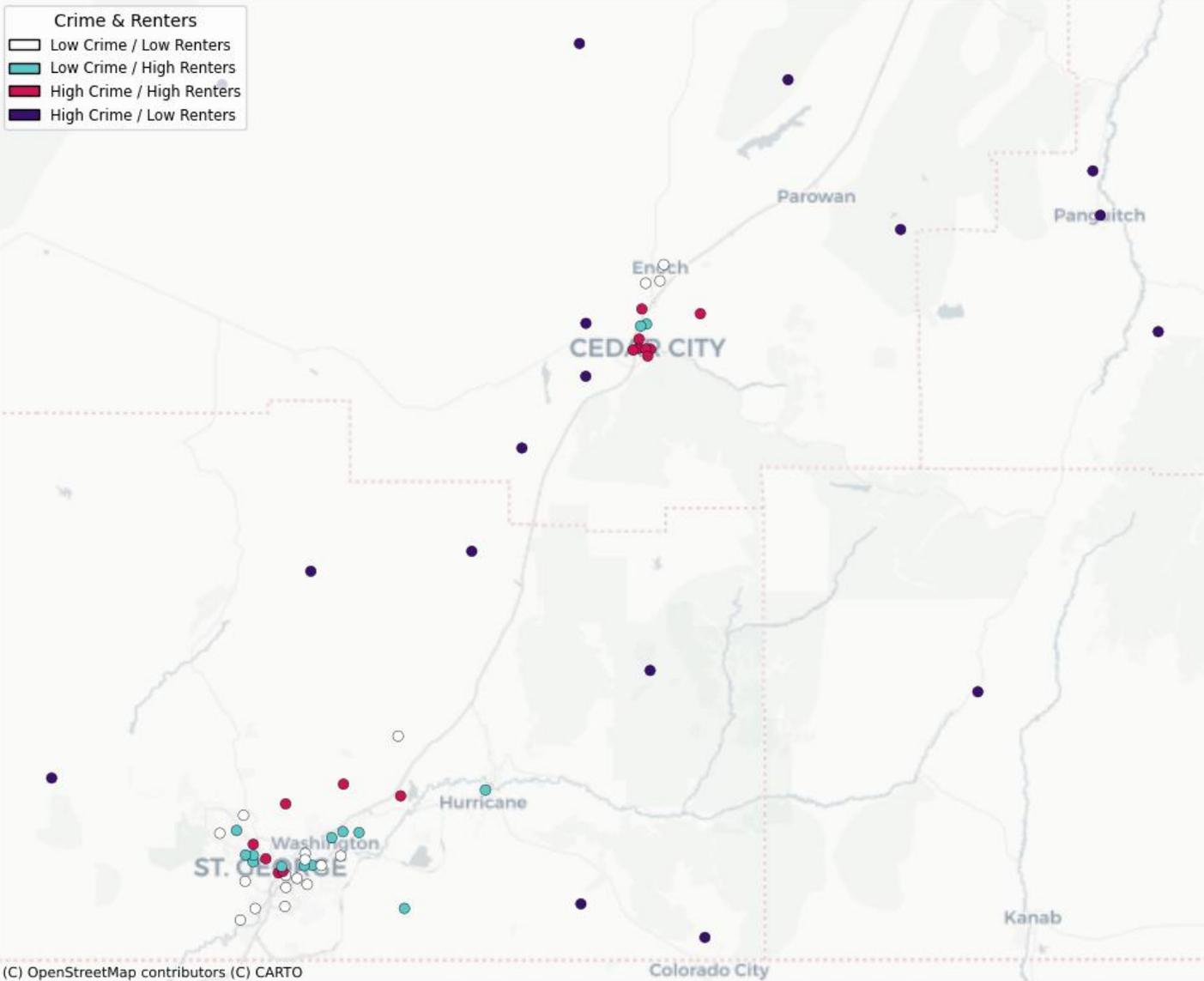
Crime vs. Renters: Northern Utah



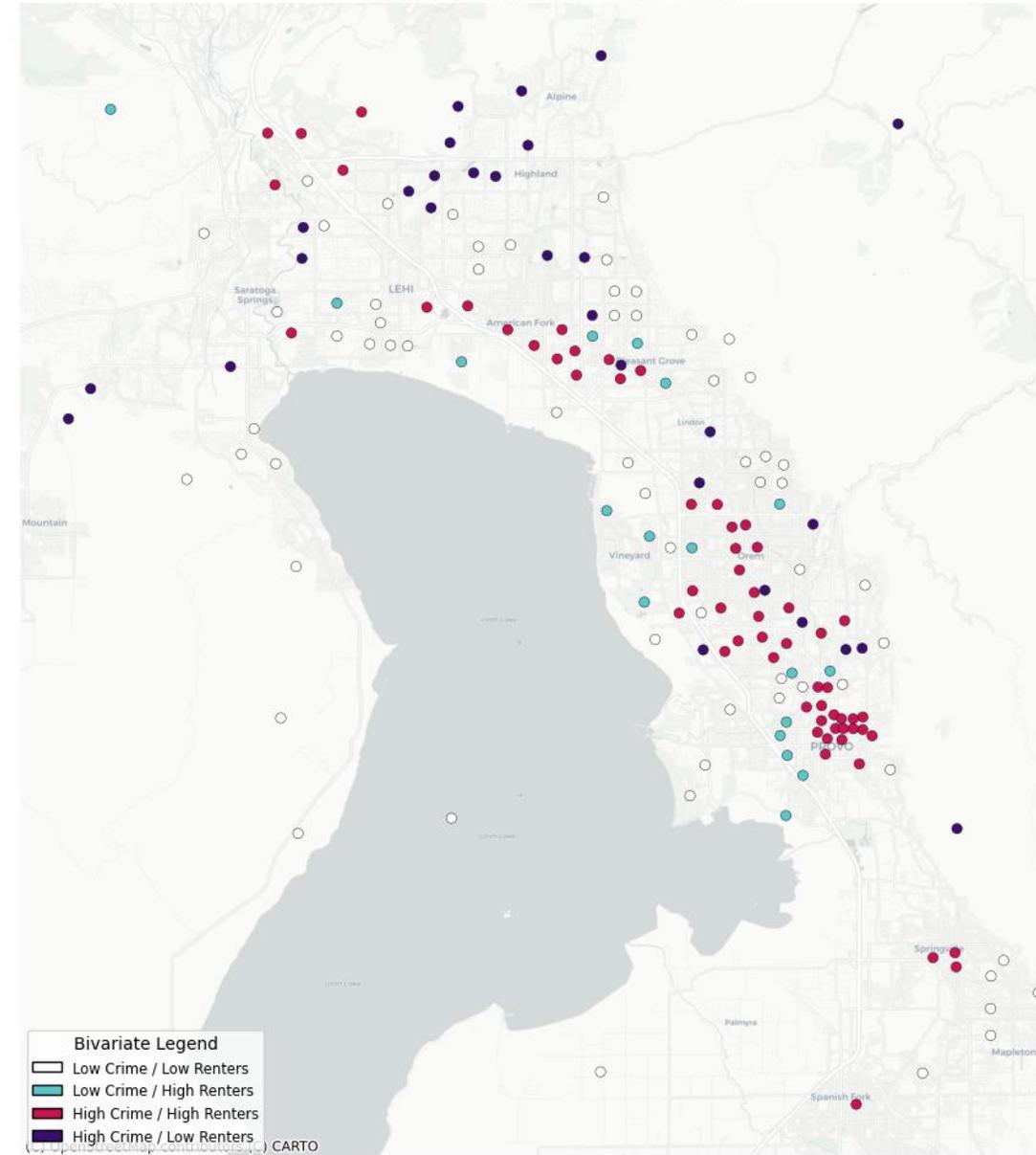
Crime vs. Renters: Salt Lake Valley

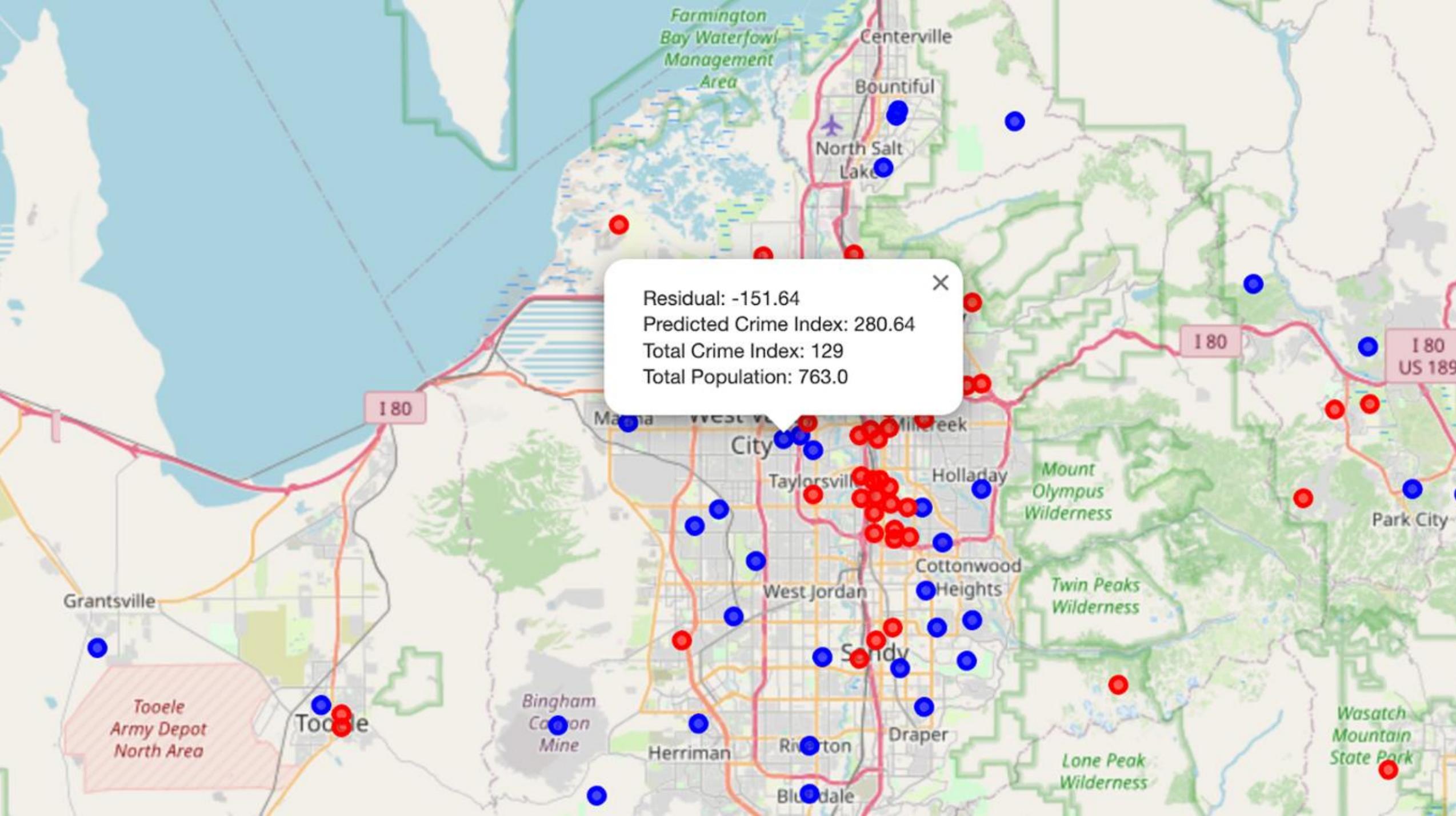


Focused Bivariate Map: Crime vs. Renters in Southwest Utah

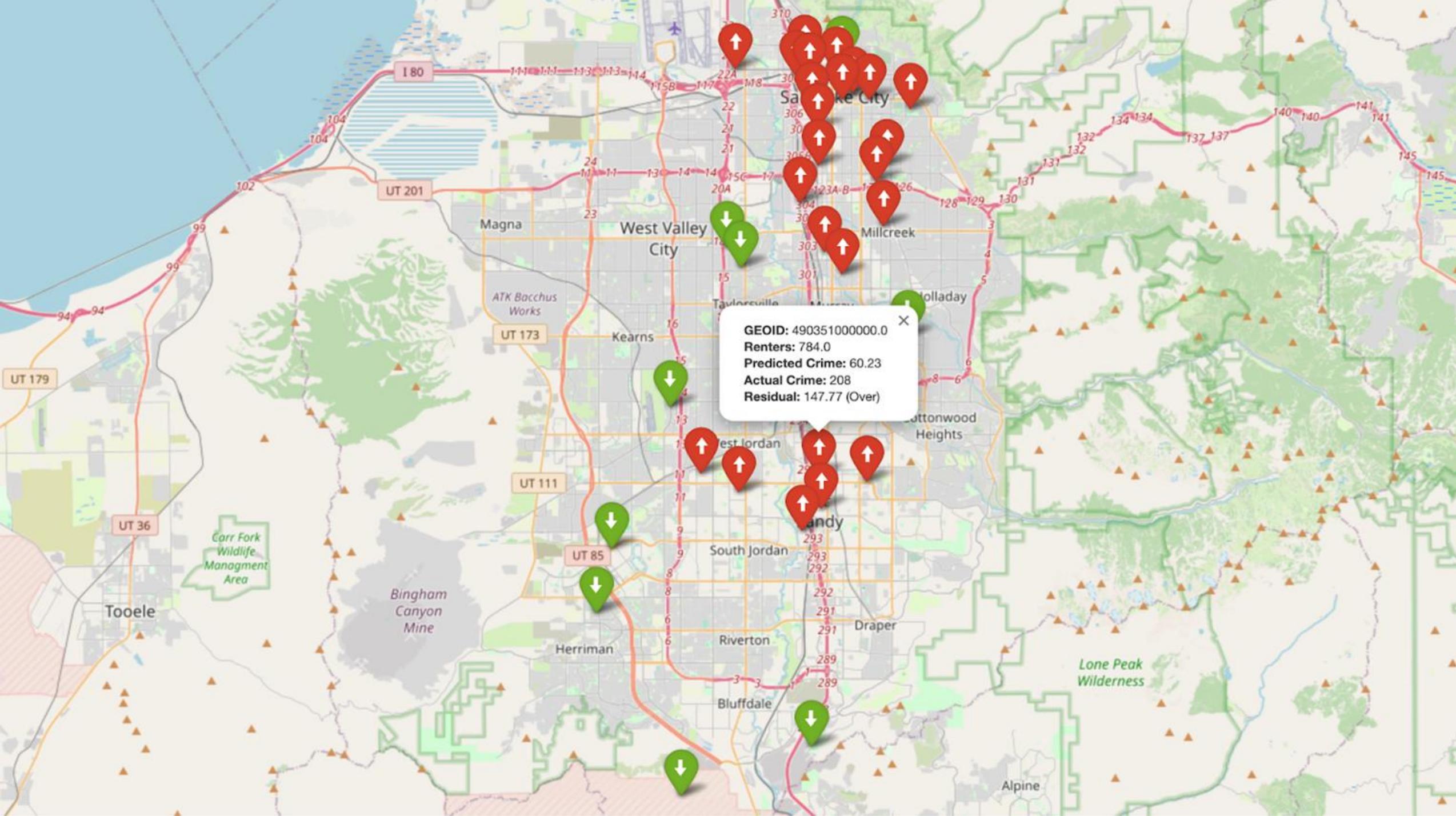


Crime vs. Renters: Utah County





Residual: -151.64  
Predicted Crime Index: 280.64  
Total Crime Index: 129  
Total Population: 763.0



**GEOID:** 490351000000.0  
**Renters:** 784.0  
**Predicted Crime:** 60.23  
**Actual Crime:** 208  
**Residual:** 147.77 (Over)

# Ethnographic Research

We identified the following locations that could provide qualitative nuance to the high % renter correlation with crime:

1. Sage Valley Apartments (West Valley, lower than expected crime, high renters)
2. Crosswood Apartments up through Orion Circle (West Valley, lower than expected crime, high renters)
3. Simpson Avenue, Sugarmont Drive, area surrounding fairmont park (South Salt Lake, higher than expected crime, high renters)
4. Vogue Park, Hidden Villa Rd, MacArthur Avenue, area across from Sam's Club (South Salt Lake, higher than expected crime, high renters)
5. Creekside Village area of Daybreak (lower than expected crime, high renters)
6. Area just south of Copper Mountain Middle School (lower than expected crime, high renters)
7. Area between 500 E and 860 E Around 620 S American Fork (higher than expected crime, high renters)
8. Viewpointe Apartments to West 100 S American Fork (lower than expected crime, high renters)
9. West 975 N to 1200 North and Village Park Apartments, Orem (lower than expected crime, high renters)



# Conclusions

- Composition is more important than density
- Utah is likely different for some of the national patterns
  - National patterns often rely on large urban studies
- There are critical differences between density and crime by census block groups
  - One reason? Percent renters may be driving the relationship, especially in Urban places
- Ethnographic insights suggest that urban design and opportunities may account for the variation in the relationship between % renters and crime.

## Next steps:

- We need a nuanced approach that requires training and more targeted research
- Interpretation and application is key for using these insights to build responsible growth

# Housing and Growth Assessment Tool (for city planners)

## Step One

1. There is no easy "rule of thumb" to understand the relationship between growth/housing and crime.
2. Growth is less important than the composition of the population.
3. If any factor matters most, it is % renters.
  - But even this relationship is modestly linked to crime rates, especially in rural areas.
  - When shares of renters exceeds 13.8% renters in a census block group, there is a slight uptick in crime related reporting.
  - Generally, crime appears to increase 3% for every 10% increase in renters.

# Housing and Growth Assessment Tool (for city planners)

## Step Two

What can cities do to reduce crime risks? (general best practices)

- Design for natural surveillance- Use active frontages, lighting, clear sightlines, and mixed-use development to create “eyes on the street.” Avoid deep setbacks, blank walls, or isolated parking lots.
- Foster community cohesion- Support neighborhood gathering spaces, local events, and community programs that strengthen trust and informal social control. Encourage stable, long-term residency through affordable, quality housing options.
- Integrate economic opportunities for all Utahns- Expand access to jobs, education, and youth programs—especially in lower opportunity areas. Pair growth planning with investments in social infrastructure and opportunity pathways.
- Promote well-managed rental housing- Encourage property management standards, on-site managers, and maintenance incentives. Focus on quality design and community integration.
- Maintain public spaces- Prioritize upkeep, cleanliness, and activation of parks, plazas, and transit hubs. Activate spaces with programming and nearby housing or businesses.
- Tailor strategies to local context- Urban areas: emphasize design, management, and density integration. Rural areas: invest in youth programs, local engagement, and resource access.

# Housing and Growth Assessment Tool (for city planners)

## Step Three

1. Use Envision's geospatial data to evaluate your own census block group.
2. Compare areas with high density/renters and low crime and high density/renters and high crime
  - o Evaluate what you know from local context why these areas might be different.
3. Partner with Envision / Socio / Universities to create a plan.

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## Step Two

1. Best practices.....

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