

# Risk of Gentrification-Driven Displacement in Boston

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Class: Advanced GIS (GIS 102)

Date produced: May 9, 2017

## Introduction

Boston, like many major American cities, has faced growing gentrification in the last several years. Gentrification can bring benefits including better access to resources and higher quality of life, but gentrification often comes with higher rent prices that force lower-income residents out of their homes. This project investigates the risk of gentrification-driven displacement in Boston. Awareness of displacement risk can help communities and organizations plan to prevent it.

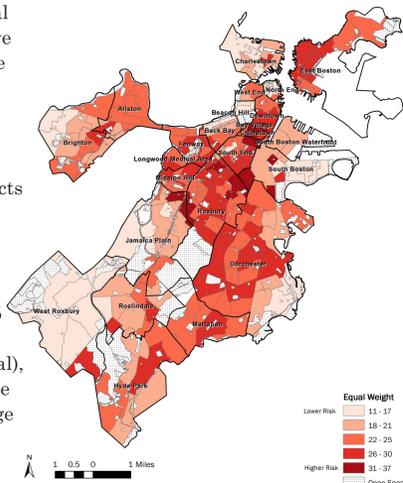
Several US cities have conducted GIS-based displacement vulnerability analyses. These analyses incorporate measures of demographics and access to resources into an index measuring geographic distribution of displacement risk. This project applies Seattle's model (with modifications) to the city of Boston, due to the similarity of the two cities size and situation.

This project examines two main questions: Which neighborhoods of Boston are most vulnerable to gentrification and displacement? And do neighborhood boundaries seem to affect risks, or are other factors more significant?

The project builds on work done by myself and my teammates McKayla Dunfey, Ka Lum Fung, and Yi Zhong for the UEP Field Projects course, for which we worked with Southwest Boston Community Development Corporation to analyze risk of displacement in Hyde Park and Roslindale.

Indicator	Weight
Population of color	17
Renter population	17
Education level	7
English proficiency	7
Poverty level	17
T Access	13
AMI	11
Bus Access	3
Food and Pharmacy Access	6

This inset map gives equal weight to each of the above indicators. The results are mostly similar, but only 8 census tracts fall into the highest risk category (compared to 11 in the weighted map). This reflects the limitations of any weighting system: with several variables at play, each with its own reclassification for the 1-5 scale (Equal Interval, Natural Breaks, or manual), adjusting the weight of the combined index can change the results.



## Methods

### Vulnerability and Amenities

Risk of displacement is based on a combination of nine variables in the categories of Vulnerability and Amenities. This follows the typology presented by the City of Seattle in its Seattle 2035, and is modified based on availability of data for Boston.

- |   |  |
|---|--|
| <b>Vulnerability</b>  | <b>Amenities</b>   |
| <ul style="list-style-type: none"> <li>• Race: % of population who are not non-Hispanic white</li> <li>• Rentership: % of households who are renters</li> <li>• Education: % of population 25 and over without Bachelor's degree</li> <li>• Language: % of population over 5 who speak English "less than very well"</li> <li>• Poverty: % of population with income below 200% of poverty level</li> </ul> | <ul style="list-style-type: none"> <li>• Access to MBTA T stop within 0.25 miles</li> <li>• Tract with Median Income &lt; 80% of AMI next to Tract with MI &gt; 120% of AMI</li> <li>• Access to bus stops within 0.25 miles</li> <li>• Access to grocery stores, pharmacies, and restaurants within 0.25 miles</li> </ul> |

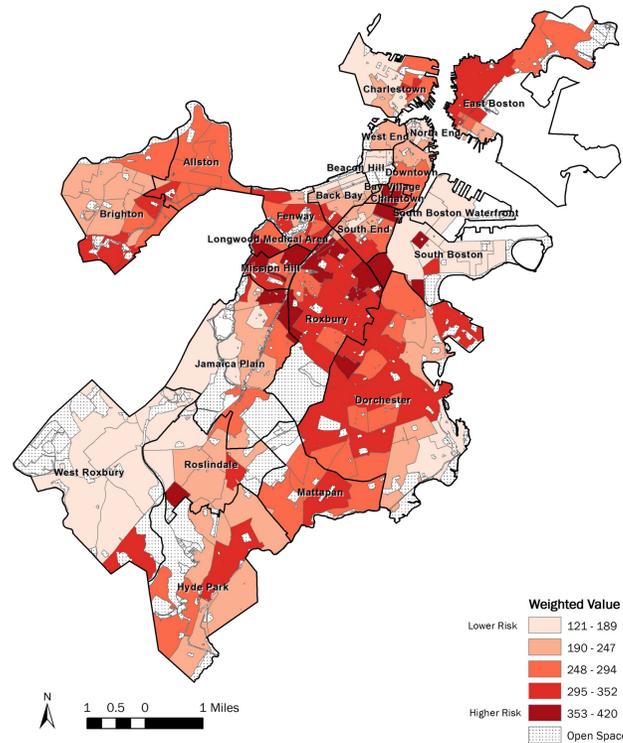
The vulnerability measures were obtained via ACS 2011-2015 and Census 2010 data, and joined with census tracts. For each measure, census tracts were rated on a scale of 1 to 5 (1 as lowest risk, 5 as highest). This method was also used for the AMI metric in the Amenities category; for the other three metrics,

0.25 mile walksheds were set up around T and bus stops (MassGIS) as well as business locations (ReferenceUSA) using a Service Area-based Network Analysis on Tiger street centerlines. The resulting polygons were then spatially joined with census tracts based on Intersection, so a census tract at least partially within a walkshed would be given added value accordingly. These were then combined into a weighted index, with weights based on reliability of data and perceived significance to displacement risk. Census tracts were then classified into five categories based on geometrical intervals.

### Grouping Analysis

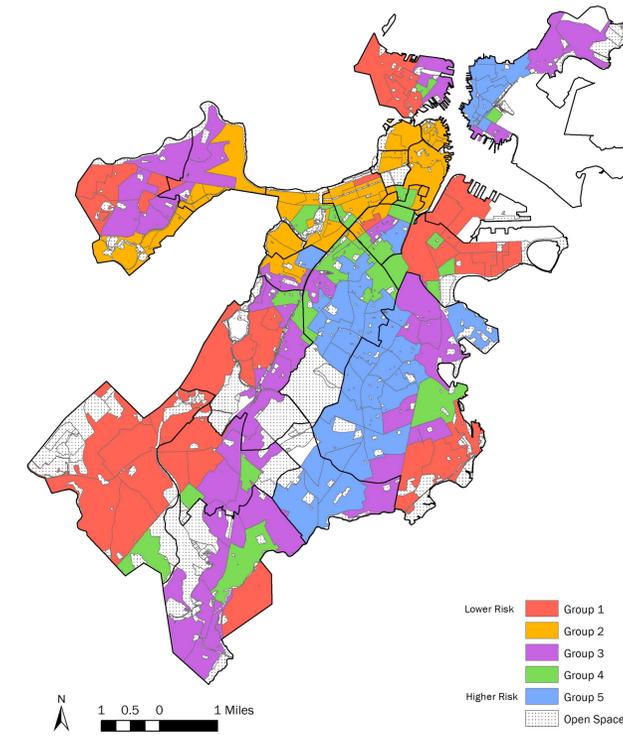
Grouping analysis is a spatial statistics tool that groups geographies—in this case, census tracts—based on their similarity across multiple variables. Here, 5 groups were created, and they were analyzed for similarity across the nine indicator variables discussed above. The boxplot below illustrates the statistical distribution of the groups across variables. Analysis of the statistics and boxplot generated by the grouping analysis led to the categorization of the groups on a low to high risk scale, similar to the scale at left. Group 1, for example—lowest displacement risk—has populations that tend to be whiter, more highly educated, less poor, and that contain fewer renters.

## Neighborhood Analysis



Of the 189 census tracts that are involved in the final analysis, only 11 fall into the highest-risk category. These are mainly concentrated in Chinatown, the South End, Roxbury, and Dorchester. Roxbury, Dorchester, and the downtown neighborhoods tend towards highest risk, with a lower risk tendency to the west.

## Grouping Analysis

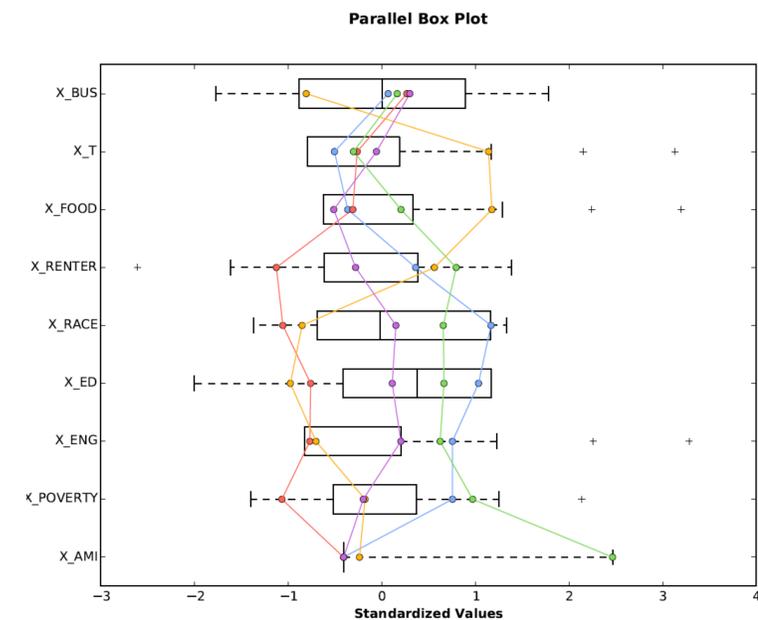


Overlaying neighborhood boundaries on the results of the grouping analysis reveals that, though some neighborhoods are mainly categorized by a single risk level, and tracts at the same risk level tend to be spatially correlated, risk levels (or groups) transcend neighborhood boundaries, including an especially high-risk group (Group 5) across Roxbury, Dorchester, and Mattapan as well as lower-risk groups on the west and north of the city.

## Results

In answering the first question, it is clear that the highest-risk neighborhoods based on this matrix include Roxbury, Dorchester, Chinatown, and the South End. Mattapan and Mission Hill also tend towards higher risk. Knowing which neighborhoods—and, even more specifically, which census tracts—are at high risk may help communities, organizations, and government agencies work towards protections for affordable housing and other measures that can mitigate the displacing effects of gentrification. In looking at the second question, it is clear that, while neighborhoods provide important boundaries for social gathering, services, and other forms of association, neighborhoods alone may not be the best form of analysis for displacement risk. The grouping analysis reveals that, while similar risk groups tend to be spatially close, they also transcend boundaries. Group 5—the highest risk—extends through Roxbury, Dorchester, and Mattapan, for example. The groups created by this analysis also reflect a logical understanding of gentrification, with areas with similar poverty and rentership levels often having similar resource access and demographic makeup. Utilizing a non-neighborhood lens when analyzing citywide problems may encourage inter-neighborhood collaboration on the community level, and may allow for more effective interventions from city government.

This analysis has significant limitations, including the effects of weights (as discussed at bottom left) and the accuracy of data, including particularly ReferenceUSA data about businesses. In addition, this analysis focuses on most recent data, but gentrification and displacement occur over time. Incorporating older census and ACS data would lead to a more complete picture of gentrification and its effects in Boston.



Projection: Massachusetts State Plane NAD 83 (2001) (Lambert Conformal Conic)

Data sources: MBTA data from MassGIS, Boston centerlines data from TIGER16, Business data from ReferenceUSA, demographic data from ACS 2011-15 Five Year Estimates and Census 2010 (via American Fact-Finder).

Work Cited:

City of Seattle Department of Planning and Development. "Seattle 2035: Growth and Equity: Analyzing Impacts on Displacement and Opportunity Related to Seattle's Growth Strategy (Public Review Draft)." City of Seattle. May 2015.

