

Air pollution in Boston's Chinatown and Income Disparity

Introduction

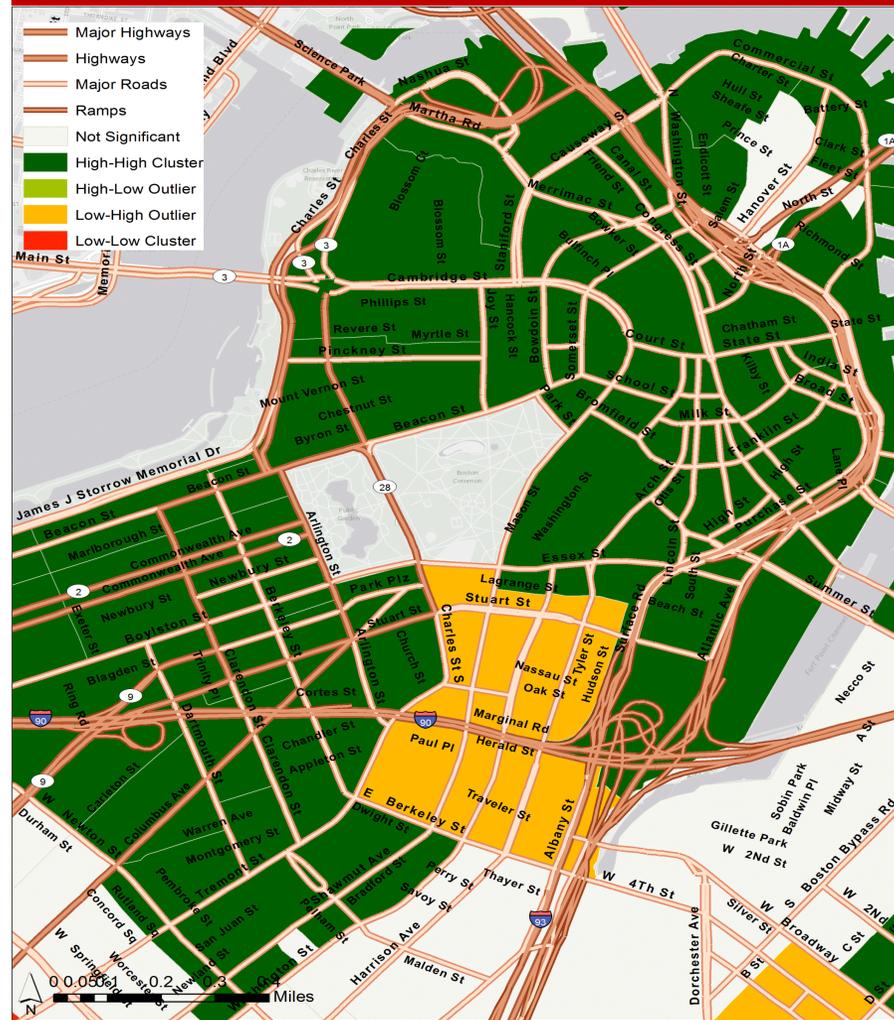
Boston's Chinatown is the third largest in the United States, and like many Boston neighborhoods build on top of a landfill. Due to developing railways the area became less desirable to earlier immigrants of mostly Jewish, Irish, and Italian descent. Chinese laborers started to settle on the area starting from the mid 1800's. Initially Chinese exclusion act of 1882 limited the growth of the area, however after World War II when the act was lifted, this area started to boom with new incoming Chinese immigrants. 1950's saw the construction of Central Artery which in return saw many families displaced from the area that had become the Chinatown. With the Mass Pike extension Chinatown saw even more displacement. Currently, Interstate 90, Interstate 93, and Route 28 surround Chinatown, all of which are busy highways or major roads. Chinatown is also squeezed between wealthy neighborhoods and Boston's financial district. Further gentrification is upon Chinatown as luxury condominiums are being built at a very high rate.



Discussion

The maps created shows different stories independently. Two maps on the left show the air pollution levels in both high traffic and low traffic conditions. Proximity of highways to Chinatown effects the air pollution levels, even in light traffic conditions, high pollution pockets exist. Two maps on the right show the median household income and renter occupancy levels in metro Boston. Chinatown can be seen as the light green area surrounded by high median income households. Rental occupancy map also shows that majority of residents of Chinatown are not homeowners. This puts Chinatown residents in a unique and disadvantaged position. In recent years advocacy and academic groups have been working tirelessly to preserve Chinatown and create awareness of the harmful elements surrounding Chinatown.

Income Cluster surrounding Chinatown with Major roads and highways



Conclusion

It is Chinatown's unique position that puts it in danger to be engulfed by gentrification and displacement. As seen in the center map Chinatown is a low-high outlier in an income cluster analysis, meaning that it is a low-income area surrounded by high income neighborhoods. Accentuated by the proximity to highways and major roads Chinatown is exceptionally vulnerable to high levels of air pollution. Many studies show that higher levels of air pollution is associated with higher levels of asthma as well as possible increase in cardiovascular diseases. Awareness becomes highly important, and community involvement becomes a necessity in order to preserve Boston's historic Chinatown. Studies show communities of color



are more concerned with air pollution and expect more out of the government to have more involvement (Laws et al. 2015). Part of the mission of CAFEH study from Tufts School of Medicine is to bring awareness to Chinatown community and increase community involvement at the grass roots

level. New aim of the CAFEH study is to help communities in implementing air-filtration into housing and schools to reduce exposure to pollution.

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Sources

Data Sources: Census Tract 2014, MassGIS, Tufts University School of Medicine CAFEH Study, ESRI Data Map10.

Image Sources: Boston-Chinatown.info, Boston Magazine

References: Barton Laws, M., Yeh, Y., Reisner, E. et al. J Community Health (2015) 40: 948. doi:10.1007/s10900-015-0017-1, Boston-Chinatown.info

Coordinates: GCS North American 1983

Projection: NAD 1983 State Plane Massachusetts

Cartographer: Anil Gürçan

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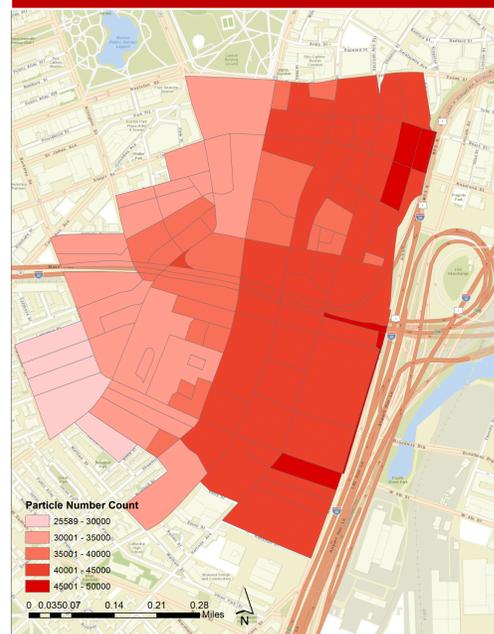
Methodology

Air pollution data was obtained from Tufts School of Medicine, Department of Public Health, and Community Medicine. Their Community Assessment of Freeway Exposure and Health Study (CAFEH) collects air pollution data from communities near highways such as Somerville, Dorchester, South Boston and Chinatown. Ultrafine particles which are extremely small particles (less than 100 nanometers) are measured as Particle Number Count (PNC). The PNC data is collected through a van with special sensors driving through affected neighborhoods. The PNC data was joined with MassGIS census tract polygons. For different traffic conditions the temperature was controlled for 0 degrees Celsius (32F), wind was controlled for East wind only.

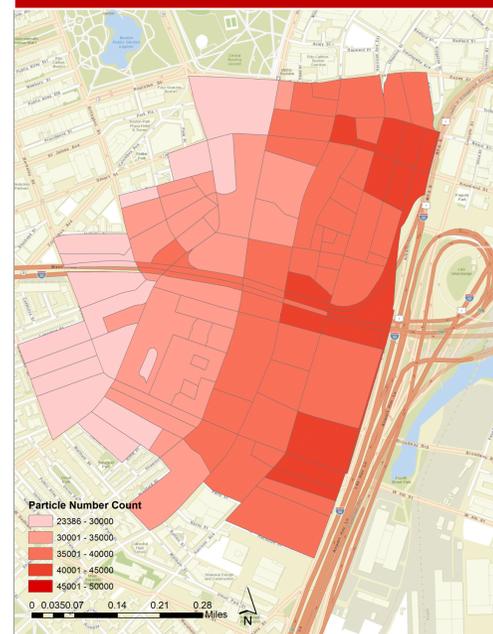
Median Income data obtained from Census, and joined with MassGIS census tract polygons. Cluster analysis was performed to obtain the local Moran's I.

Renter occupancy data was obtained from Census and joined with MassGIS census tracts polygons.

Heavy Traffic



Light Traffic



Median Income



Renter Occupancy

