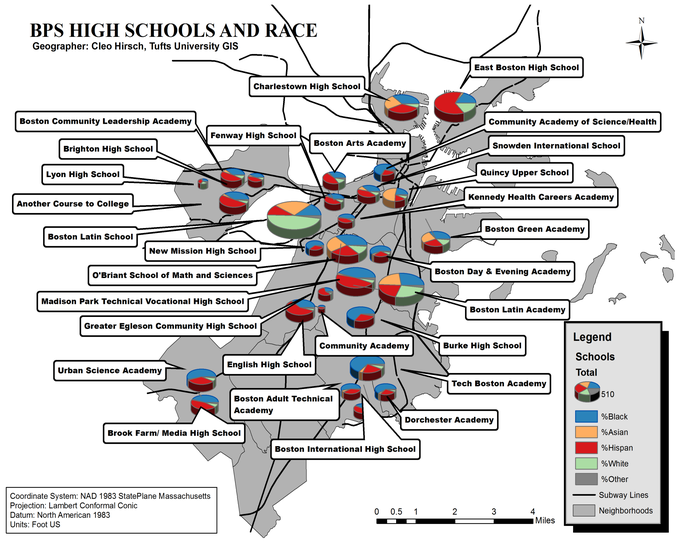
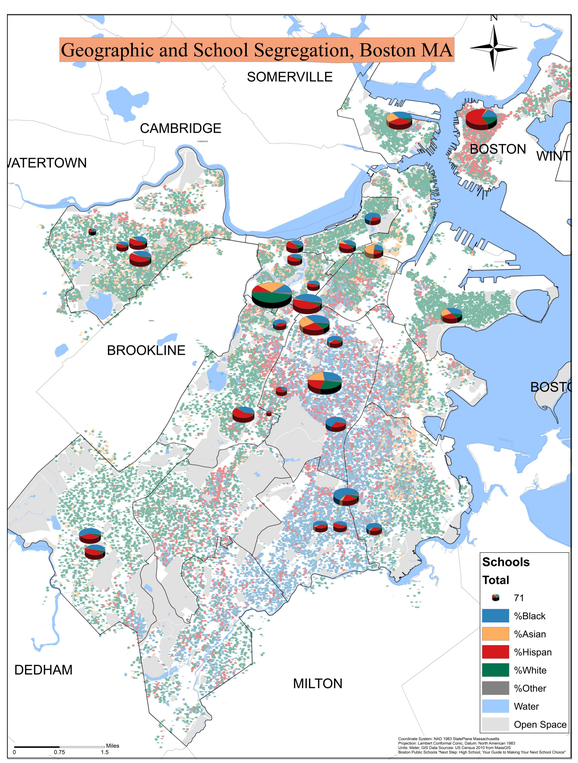
School Choice and Racial Segregation in Boston Public High Schools



Index of Dissimilarity	Boston	BPS High Schools
White-Black	69.2	55.75
White-Hispanic	54.6	53.0
White-Asian	34.9	28.9
Black-Hispanic	39.6	19.98
Black-Asian	67.4	61.6
Hispanic-Asian	57.6	62.5



Purpose

The purpose of this project was to look at the geographic segregation of Boston, and compare that segregation to in-school segregation. The central question that these maps and the data within them seek to answer is, does the current system of choice-based student assignment in Boston create more or less segregation in schools than geographic-based student assignment might? Approaching this question from a geospatial perspective enables us to gain a holistic understanding of the complex network of high schools that currently exist within the Boston Public Schools (BPS), the way in which this network of schools reflects or does not reflect the geographic segregation within the city, and what might happen if Boston returned to neighborhood based schools.

Across the country "school choice" based reforms are being implemented in urban school districts. Proponent of school choice argue that these programs enhance opportunity for parents and students to choose among public schools, and increase integration by circumventing geographic-based student assignment. Typically, however, these reforms are implemented in urban school districts comprised primarily of poor and minority students, and the repercussions of choice for such students are widely debated.

In Boston, choice-based reforms are being implemented within a district made up of 86% minority students and 75% students on free and reduced lunch. Over the past decade, these school choice based reforms have shifted the portfolio of high schools from 12 large comprehensive schools, to one with 30 schools. Of these 30 schools, 17 have fewer than 500 students, 9 are "pilot schools," 3 are Horace Mann Charter schools, and 3 are exam schools. Furthermore, 1/3 of Boston's high schools require special, separate applications. These maps and the statistical analysis that accompany them examine the effect that the structure of this new choice-based urban school district is having on segregation within Boston's high schools. Considering the demographic information illustrated in these maps, this project seeks to question the role of choice in creating integrated public high schools.

Findings and Conclusions

Considering the maps and the data presented, this project concludes that the current system of school choice in Boston in not serving to integrate schools to a greater degree than neighborhood based student assignment might. There is severe racial segregation in Boston today, as illustrated on the Geographic Segregation Map as well as through the data on the Index of Dissimilarity based on Census Tracts. This project finds, however, that Boston's high schools are similarly segregated under the current choice-based assignment system, that allows for students to preference any schools they like across the city, as they might be if student assignment was based on geographic location. That choice is breaking down along racial lines indicates that it is not as egalitarian a system as school choice advocates make it out to be. The complexities of the current student assignment program, in which all families must research, locate, and choose from a long list of schools, may be a factor causing the supposedly "race-blind" choice policy to result in racially segregated school assignment patterns.

This project argues that Boston should return to a neighborhood-based student assignment program because it would enable the city to save some of the 9% of the total budget currently spent on transportation, while such a change would not increase school segregation from its current level. Furthermore, looking at the maps and data presented here, it is possible that if the BPS returned to neighborhood based student assignment, segregation might actually decrease in BPS high schools. This is because D is calculated for Boston as a whole on the scale of Census tracts, which are small geographic areas. The map depicting a 1 mile radius from each school illustrates that if Boston were to return to neighborhood schools, each school would draw students from many Census tracts, thus increasing the geographic area from which D is measured and lowering the value of D. It is possible that neighborhood schools could results in D values that are lower than the current levels of segregation seen in BPS high schools. In the future, as the BPS works to change its student assignment process, GIS studies could be used to determine how hypothetical neighborhood-based student assignment zones would effect racial segregation. Such studies could influence the future of school choice and student assignment in the BPS.

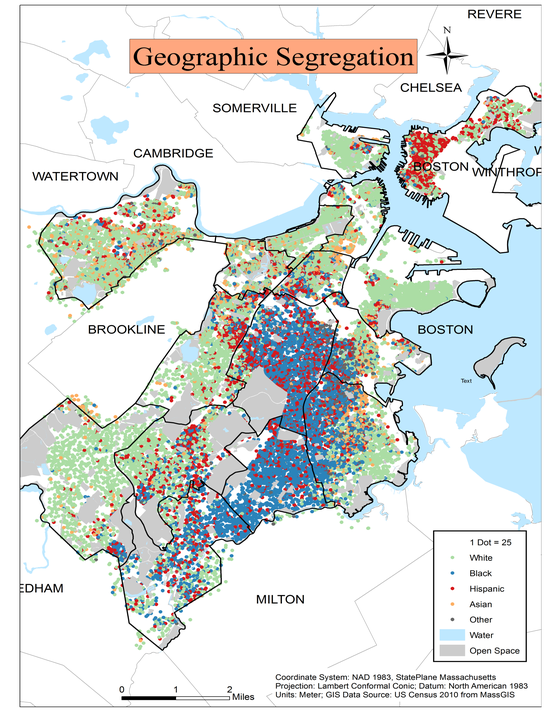
Methods

This project was approached using both a geospatial and a statistical analysis, and it is the combination of the two approaches that allows me to analyze the relationship school choice and racial segregation.

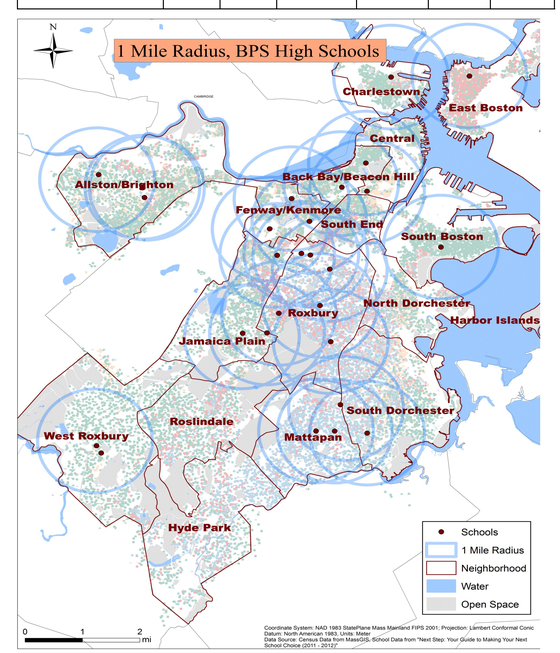
I took non-spatial information on BPS high schools, that is not typically used in GIS, and created attribute tables on the racial breakdown of all public high schools in Boston. Then I georeferenced this data onto maps containing US Census 2010 data. The racial/ethnic subgroups I used included Hispanic/ Latino, non-Hispanic Whites, non-Hispanic Blacks, non-Hispanic Asian Americans, and non-Hispanic Other. I then created maps that show the geographic and school segregation in Boston. I also created a map with a 1 mile buffer around each school, to demonstrate the geographic range from which schools might draw students if they were to use neighborhood-based assignment.

Statistical Analysis: Looking at the maps, it is clear that there is a complex network of high schools in Boston, and that racially there are only few schools that contain a significant proportion of white students, while the rest of the schools are majority – minority. I further analyzed the data on these maps by looking at the Index of Dissimilarity for Boston as a whole and for BPS Highs Schools, in order to compare the levels of segregation within the different layers of my maps. The Index of Dissimilarity (D) is the most commonly used measure of segregation. For geographic segregation, D measures if one group is distributed across Census tracts in the same way as another group. For BPS schools, D measures the unevenness of distribution of children of different races across schools. If all schools had the same racial composition, in that each school's composition reflected the aggregate statistics calculated for all schools, D would have a value of 0. In a situation of complete segregation D would have a value of 100. Usually, values between 0 – 30 are interpreted as a low level of segregation, values between 30 – 55 are interpreted as moderate segregation, and values above 55 are considered extreme levels of segregation. The Index of Dissimilarity equation is as follows:

$$D = \frac{1}{2}\sum \frac{bi}{B} + \frac{wi}{W}$$



Boston High School Students	Black	Asian	Hispanic	White	Other	Total
# of students	6892	2213	6574	2640	377	18696
% of total	0.368	0.118	0.352	0.14	0.02	



Geographer: Cleo Hirsch, Tufts University, GIS 101