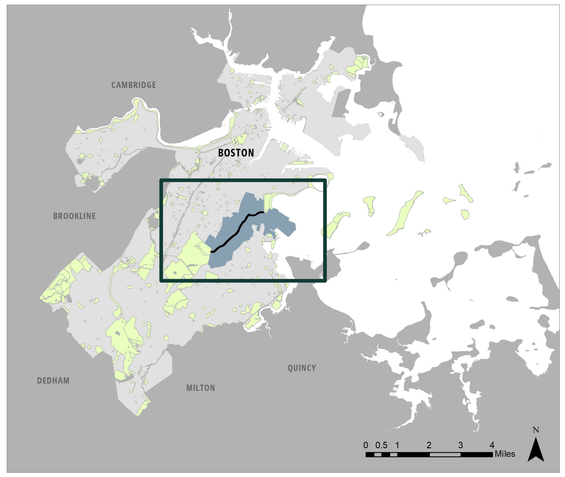
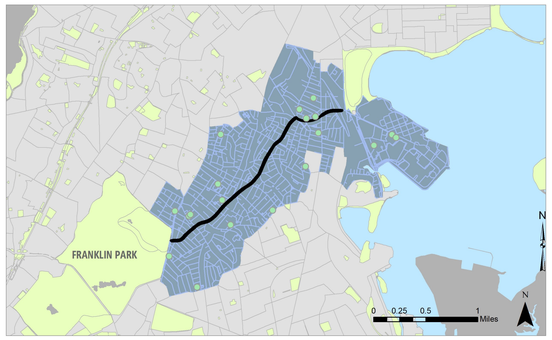
STEP BY STEP Assessing Safe Routes to School Along Columbia Road



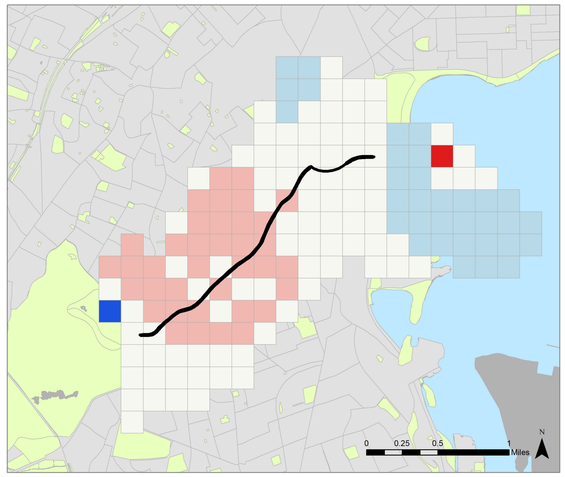


The Columbia Road Study Area

- Schools
- Columbia Road
- Walk Network
- Columbia Road Study Area
- Open Space
- Census Block Groups 2010

Columbia Road is a busy, four-lane road that runs for 2.4 miles through Dorchester and Roxbury, MA

(Photo: Lev McCarthy)



Clustering of Walkability Intensity

- Not Significant
- High-High Cluster
- High-Low Outlier
- Low-High Outlier
- Low-Low Cluster
- Columbia Road

Introduction

The built environment is an important determinant of public health and social inclusion. For example, access to open space and walkable routes can affect residents' levels of physical activity and therefore, rates of chronic conditions like obesity and respiratory diseases. Streets with slower moving traffic offer more opportunities for personal development, contentment, and social integration.

Safe Routes to School (SRTS) is a program working to improve children's health through advancing safe walking and bicycling to and from schools. SRTS programs benefit communities by increasing pedestrian safety, lowering transportation costs for school districts and families, reducing student absences and tardiness, reducing traffic congestion, and improving student health and academic performance.

Columbia Road is a major arterial road extending for 2.4-miles through the Boston neighborhoods of Roxbury and Dorchester. Its streetscape currently prioritizes vehicle travel with wide travel lanes, infrequent crosswalks, and minimal street furniture or landscaping. Since this road has been the site of several recent planning efforts, this project aimed to assess the potential for students to walk to school within this corridor and to make the case for improved pedestrian accommodations.

Methods

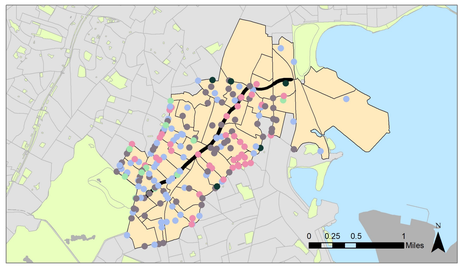
The study area was defined as block groups within ¼ mile of Columbia Road. I began by visualizing the population under age 18 using US Census data. Then I used data from an ongoing SRTS Survey, which asks parents to share information about how their children travel to and from school. I geocoded each survey response to the intersection closest to the respondent's home. I spatially joined these points to each block group to visualize average distance traveled to school. I also symbolized these points by mode of travel to assess the density of walking responses. Lastly, I used data from a Massachusetts Statewide School Walkability Analysis conducted by the Metropolitan Area Planning Council (MAPC) to assess the potential for walking to school. Using Local Moran's I and an index called Walkability Intensity (which is the natural log of the product of the probability that a student is within walking distance of a school times the estimated school-age population), I visualized the spatial autocorrelation of walking potential.

Percentage of Population Under 18

- 5.1% - 13.2%
- 13.3% - 20.6%
- 20.7% - 25.2%
- 25.3% - 33.4%
- 33.5% - 47.1%
- Columbia Road

Average Distance Traveled to School (Miles)

- 0.0 - 1.0
- 1.1 - 2.0
- 2.1 - 3.0
- 3.1 - 4.0
- 4.1 - 6.5
- Columbia Road



Primary Mode of Travel to School

- Carpool
- Family Vehicle
- School Bus
- Transit
- Walk
- Columbia Road

Walking Density

- High
- Low
- Columbia Road

Analysis

Due to the student assignment policies in Boston, students do not necessarily attend schools in their own neighborhoods. In fact, only 3.4% of survey respondents attended schools within the study area. However, school assignments are ever-changing, and just because students attend school outside their neighborhood now does not mean they will in the future. Already, 22% of respondents walked to or from school, representing a foundational level of pedestrian needs. Of those respondents, the average distance traveled to school was 0.66 miles.

The clustering of Walkability Intensity reveals several high-high clusters along the southern portion of Columbia Road. Grid cells with high values have both a large number of available grades and a large school age population, representing a high potential for walking to school as the principle commute mode.

This analysis demonstrates that Columbia Road has the potential to become an area of high walking mode share for trips to school. In other words, pedestrian improvements and infrastructure investments in this area are likely to have a large impact. Therefore, future redesign efforts should place a focus on improving the pedestrian experience, which will ultimately benefit all neighborhood residents through congestion, air quality, and public health improvements.

Acknowledgements

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Sources: MassGIS, ACS 2017 (5-year estimates), US Census 2010, Safe Routes to School (2011-2019), Metropolitan Area Planning Council, Massachusetts Statewide School Walkability Analysis (2012), Perdue et al. 2003, Sauter et al. 2008
Projection and Coordinate System: Lambert Conformal Conic, NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 (Meters)

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