

Rerouting the Hub

MBTA solutions to Boston's public transportation needs

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Introduction:

Boston is home to over six hundred thousand residents and is at the center of the tenth largest metropolitan area in the United States. The Massachusetts Bay Transportation Authority (MBTA) operates the Red, Orange, and Blue subway lines, Green Line trolleys, Commuter Rail lines, and Silver Line buses, carrying over one million passengers per day. While current efforts seek to expand the Green Line into Cambridge and Somerville, many parts of the city could also benefit from public rail transit. One goal of this project is to identify these areas to propose where new subway lines could be built.

Another project goal is to identify areas that underutilize existing subway stops. Encouraging development in these neighborhoods would take better advantage of existing infrastructure and help the MBTA's financial situation by reducing the need for

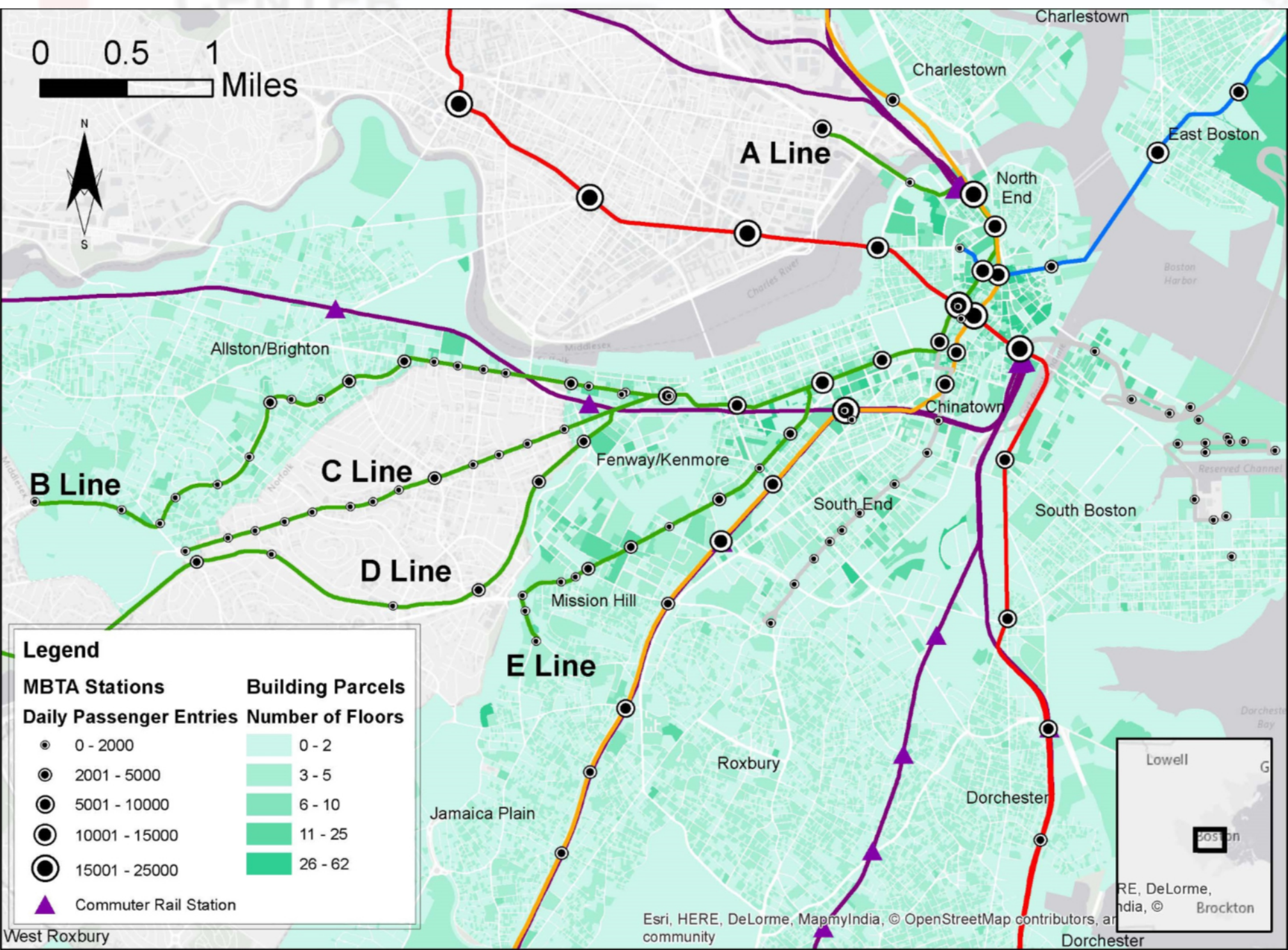
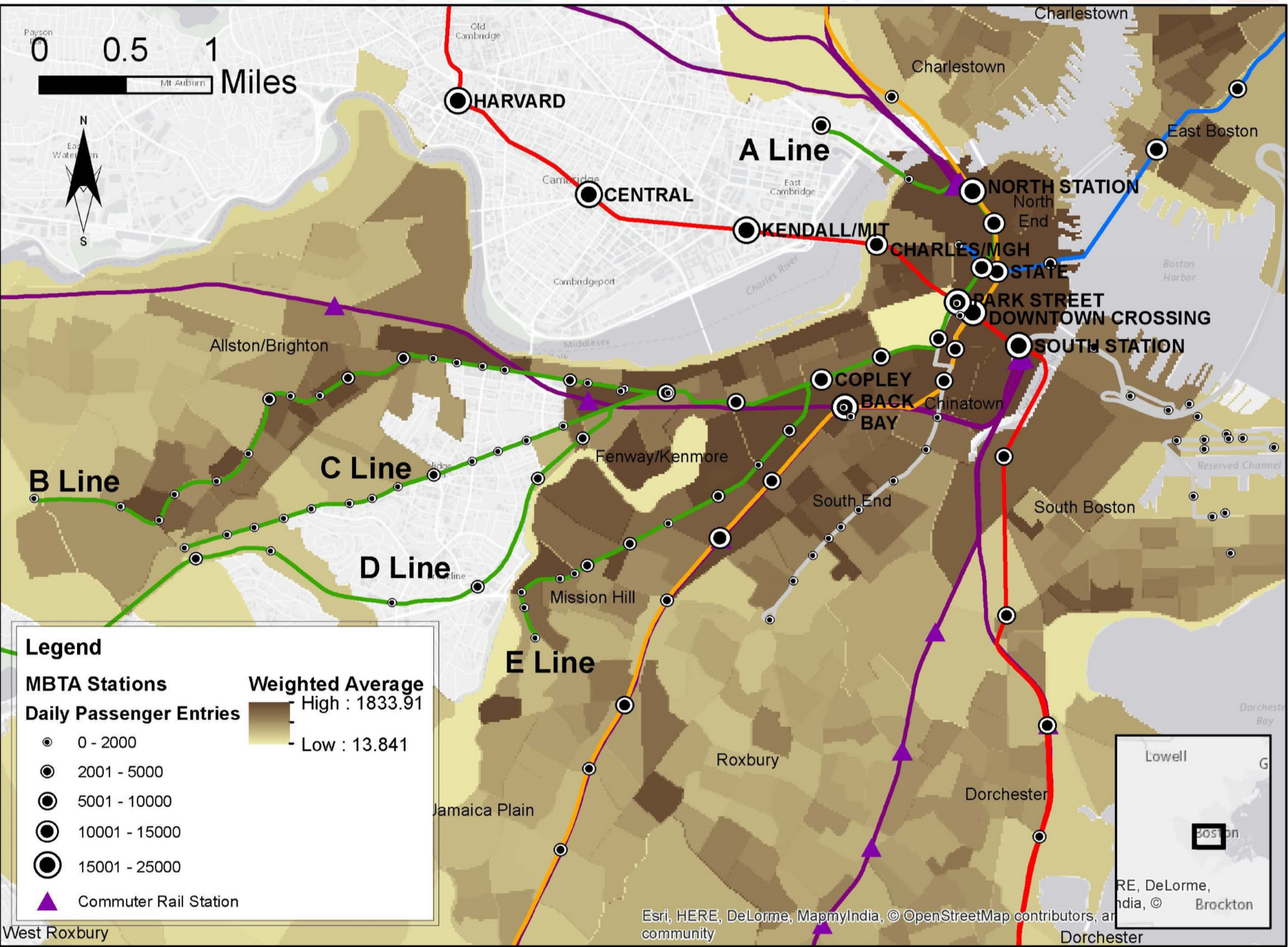
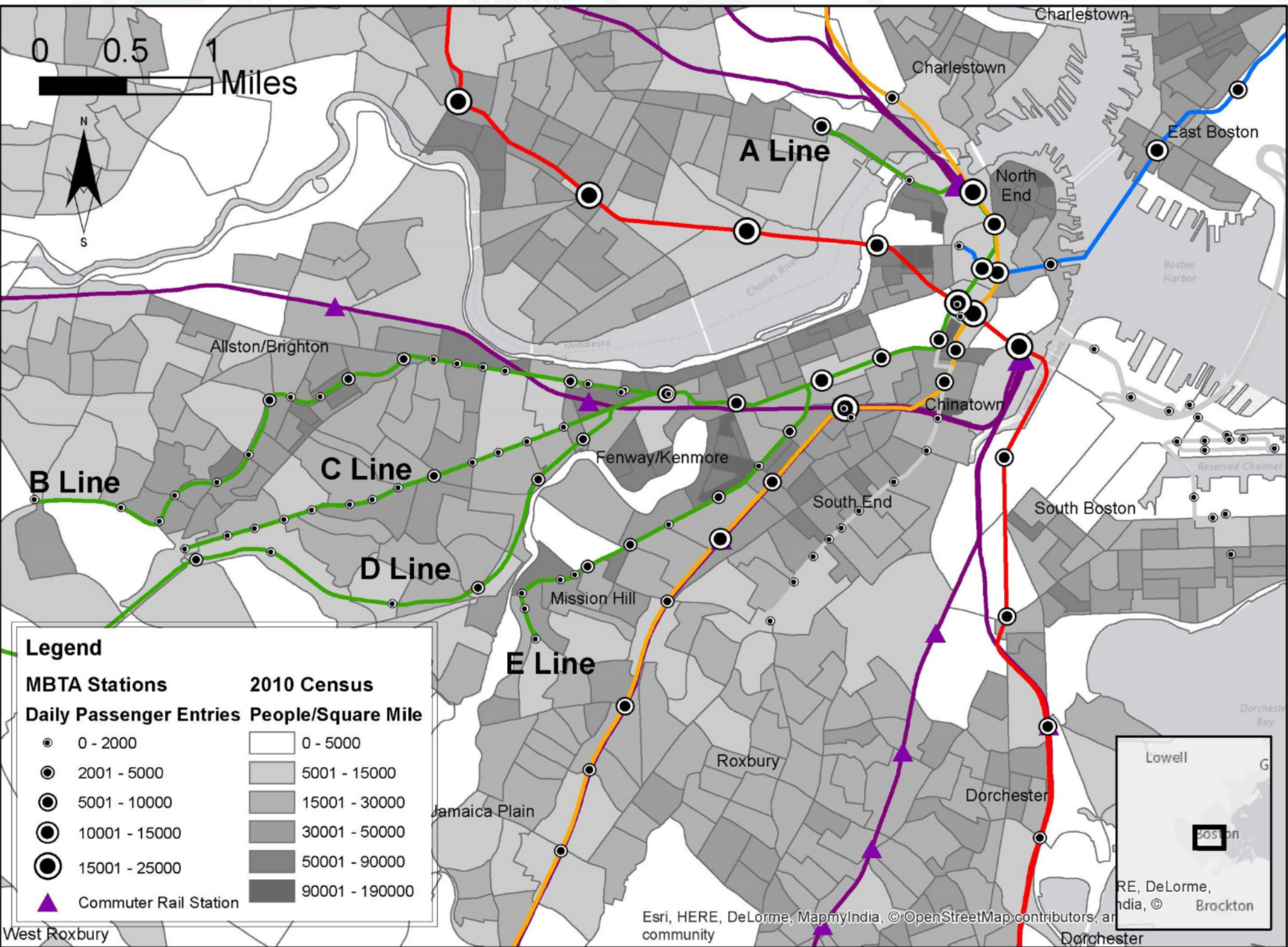
Methods:

To measure the 'urban density' of an area, I used data on population density and building height. Population density was taken from 2010 Census data and is mapped over designated census blocks in people per square mile. Building height data was taken from the 2009 Boston Assessor's map. Each building plot is colored based on the maximum number of floors, from zero to 62.

To combine these elements into an urban density factor, I converted both files to rasters and performed a map algebra analysis. I multiplied each raster by the mean of the other to normalize the two sets, with the mean floor number being 6.95 and the mean population density being 13,841 people per square mile. This product was then divided by 1,000 to achieve a more comprehensible range of values, ranging from 13.8 to 1,833.

Additionally, 2013 daily ridership data from each MBTA station was used to scale the station symbols,

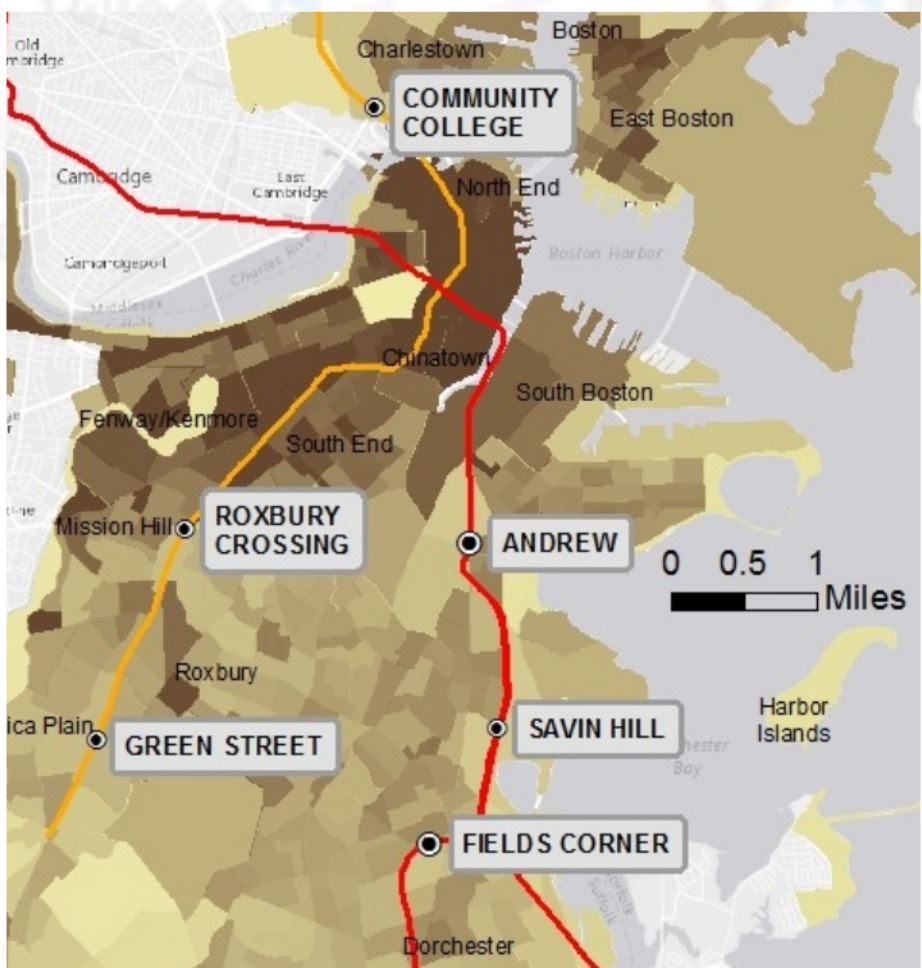
Population Density Input



Results:

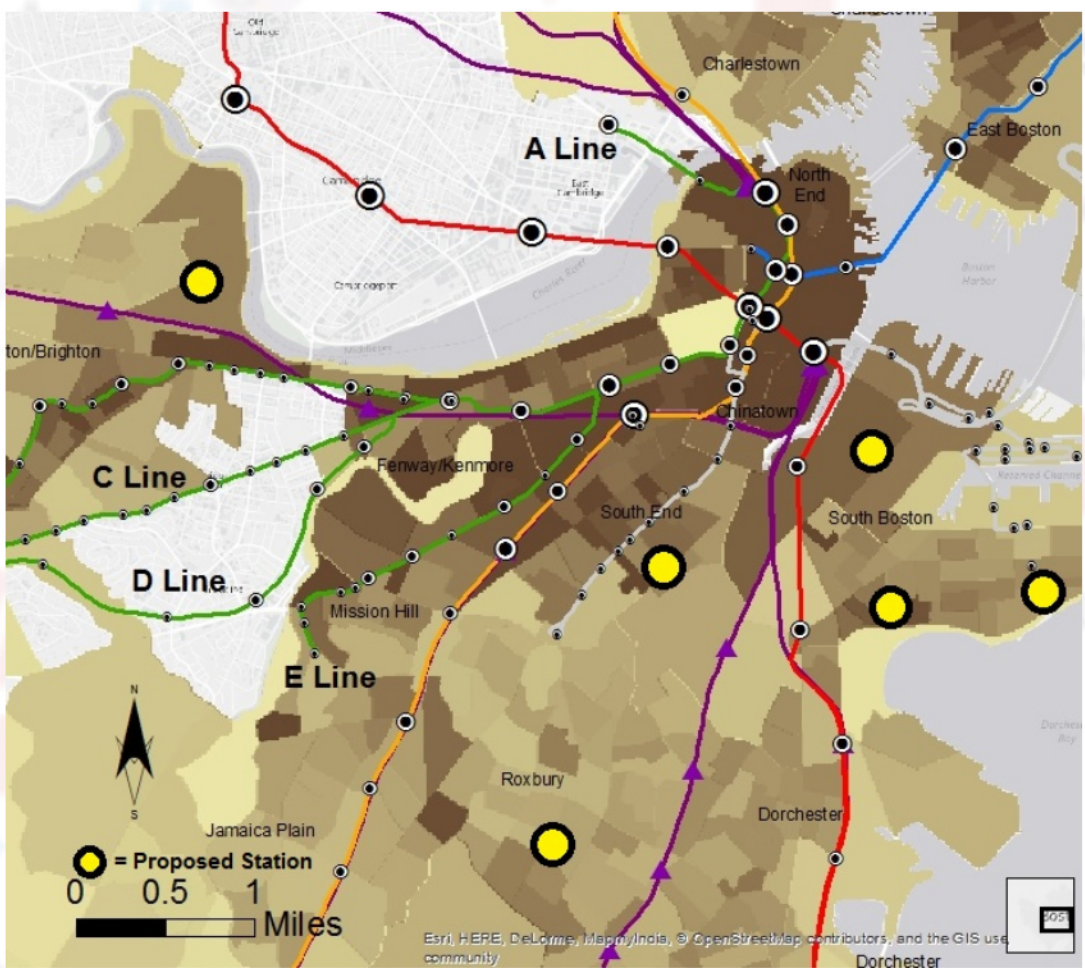
Underutilized Stations

Station	Line	Neighborhood
Roxbury Crossing	Orange	Roxbury
Green Street	Orange	Jamaica Plain
Community College	Orange	Charlestown
Savin Hill	Red	Dorchester
Fields Corner	Red	Dorchester
Andrew	Red	South Boston



Station Proposals

Neighborhood	Extension or New Line
Allston	Green
South End/Roxbury	New Line
Roxbury	New Line
South Boston (1)	Red
South Boston (2)	Red
Seaport	Red



Building Height Input

References:

MBTA Data: [http://www.mbta.com/uploadedfiles/documents/2014%20BLUEBOOK%2014th%20Edition\(1\).pdf](http://www.mbta.com/uploadedfiles/documents/2014%20BLUEBOOK%2014th%20Edition(1).pdf)