

# TRANSIT ACCESS BY SOCIOECONOMIC STATUS IN METRO BOSTON, 2014

## Introduction

The access to transit is important to link people's home to everywhere. Transit options such as walking and biking also advocate an active lifestyle and promote individual's health. Nevertheless, benefits of transit infrastructure are not equally distributed among different population groups. The access to public transportation is closely related to accessibility of jobs for low-income population (Glaseser et al., 2008). Previous studies suggest inequity of access to transit among people with different socioeconomic status and a better-designed transit system could help link underserved community to job opportunities (Foth et al., 2013). However, it has not been well studied in Massachusetts. A better understanding of how access to transit varies by residents' socioeconomic status will aid planners' and public health professionals' in future infrastructure establishment and improve disproportionate distribution of public transportation.

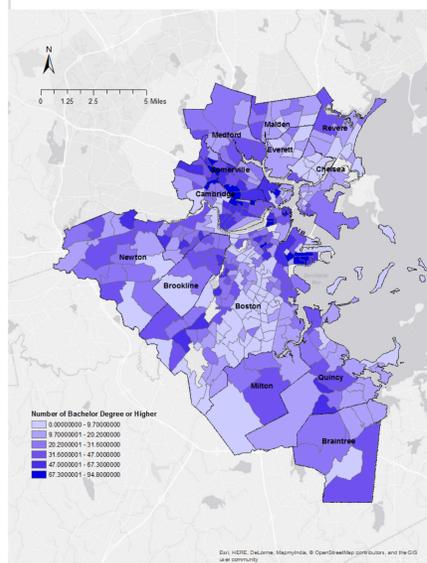
In Massachusetts, approximately 500,000 people use the public transit systems on each weekday (MassDOT, N.A.). These include 183 bus routes, 3 rapid transit lines and 5 light rail lines (MBTA, N.A.). The Hubway system is a bike share program in the Boston region and has been radiated to Brookline, Cambridge and Somerville with more than 160 stations and 1,600 shared bikes (Hubway). The overarching goal of this project is to assess the relationship between residents' socioeconomic status and accessibility of public transportation in order to address socioeconomic disparities in access to transit in Metro Boston area.

## Results

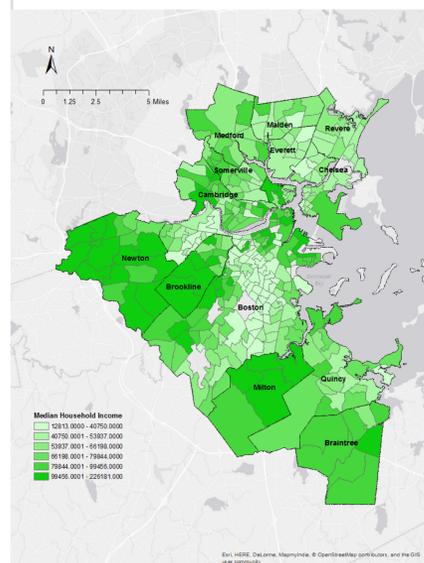
People with lowest median household income had relatively restricted access to public transit. Residents from West Roxbury, Mattapan and Dorchester are of the greatest concern because of their relatively limited access to public transit and low median household income.

People living in Somerville, Cambridge, and Quincy had relatively higher education level and median household income than other areas, as well as better availability of bus stops and train stations in the community. People who lived in North end, South End and West End of Boston had highest median household income and highest accessibility to bus, train and Hubway. They also lived closest to train stations as evidenced by network analysis, where most areas were within biking distance to train stations.

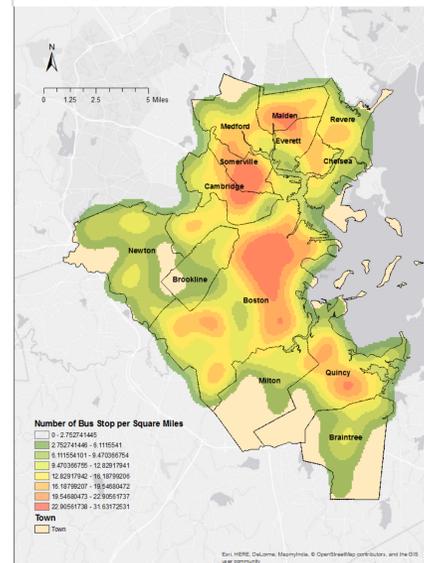
Map 1. Number of Bachelor Degree or Higher in Metro Boston Area



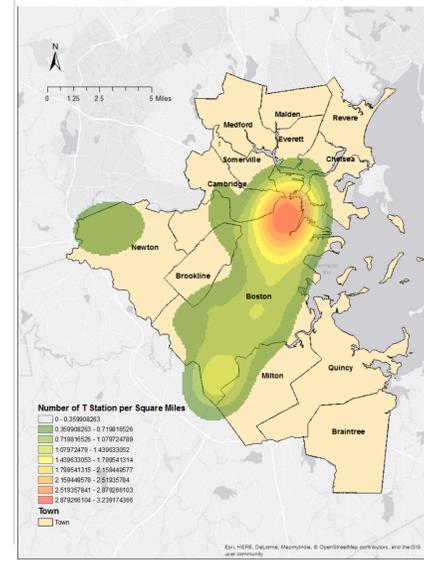
Map 2. Median Household Income in Metro Boston Area



Map 3. Density of Bus Stops in Metro Boston Area



Map 4. Density of Train Stations in Metro Boston Area



## Discussion

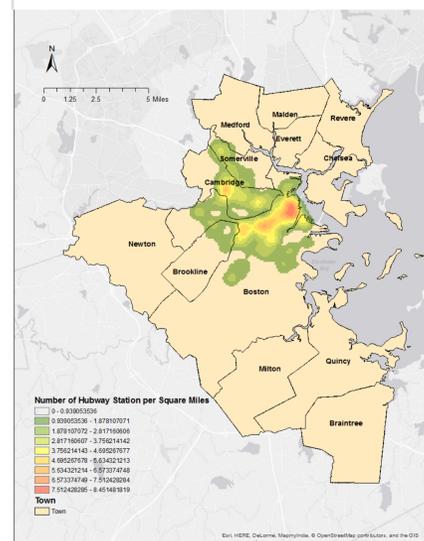
This study identifies that residents in West Roxbury, Mattapan and Dorchester are underserved communities in terms of access to public transit and their household income. The present study, however, only evaluates association between access to public transit and median household income and education level, and does not take other relevant factors into consideration, such as age, race/ethnicity, housing price, unemployment rate, travel time to workplace, etc. Better understanding of how these factors influence people's access to public transit and choice of commuting will help policymaker to identify characteristics of target population and develop more equitable public infrastructure. A spatial-temporal analysis on how the access to public transit has been changed in the past few years could provide a more comprehensive picture of the evolution of public transportation in Massachusetts.

## Methods

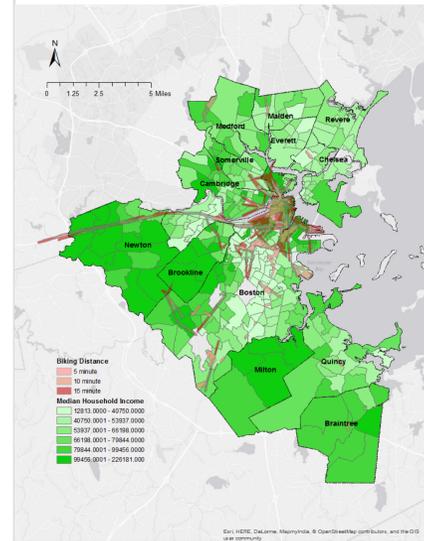
This study focused on cities in Metro Boston area that are covered by public transportations, including Boston, Braintree, Brookline, Cambridge, Chelsea, Everett, Malden, Medford, Milton, Newton, Quincy and Somerville. The latest data of MBTA bus stops and trains was obtained on from MassGIS, and that of Hubway stations was downloaded from ArcGIS. Information of residents' median household income and education level was gathered from Census.gov at census tract level.

A density analysis was conducted to picture distributions of bus, train and Hubway stations. Network areas were created to visualize areas that are within 5-, 10- and 15-minute biking distance to train stations. Choropleth maps were generated to show relationship between densities of public transit and median household income.

Map 5. Density of Hubway Stations in Metro Boston Area



Map 6. Network Areas within Biking Distance to Train Stations



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 Data Source:  
 Census.gov, MassGIS  
 Date: May 6, 2016

## References

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