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GIS 585
Final Project Methods + Outline
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1. Abstract

The densest urban areas in the United States have witnessed extreme increases to average housing costs over the last thirty years, massively contributing to the cost of living in those areas. Demand for more walkable, transit-oriented urban spaces has encouraged unprecedented real-estate speculation in America's increasingly desirable downtown cores, representing a significant shift in the location-selection behavior of the country's labor force away from the suburbs and into urban centers, which leads to the co-occurring twin phenomena of gentrification and displacement.

This GIS project aims to investigate how this phenomenon of urban redevelopment in the last half-century has affected urban neighborhoods in the metro areas that constitute the Greater Boston Area by means of analysis of demographic and economic data from the US Census Bureau as they relate to physical spatial infrastructure features including protected bike lanes and public-transit hubs in Boston and Cambridge, Massachusetts.

The purpose of this analysis is to inform the decisions of state and municipal urban planning and economic development officials and to better understand the populations that are effectively served by capital improvements to bicycle, pedestrian, and transit-oriented infrastructure in terms of income (or rent as percentage of income), race, and educational attainment.

2. Source Data

Layer	Description	Source
GROSS RENT AS A PERCENTAGE OF HOUSEHOLD INCOME (GRAPI) From 2010, 2015, 2020	CSV File. Describes change in rent burden by census tract over time. Particular interest GRAPI ≥ 35%.	American Community Survey DPO4. Selected Housing Characteristics. US Census Bureau.
Cambridge MA Bicycle Paths + Facilities	Public Shapefile	Cambridge MA GIS Data Dictionary
Cambridge Land Use Map	Public Shapefile	Cambridge MA GIS Data Dictionary
MEDIAN GROSS RENT, TOTAL From 2015 and 2019	CSV File. Includes actual recorded median gross rents.	American Community Survey B25031. Median Gross Rent by Bedrooms. US Census Bureau.
MBTA Rapid Transit	Public Shapefile (line and point)	MassGIS December 2021
YEAR HOUSEHOLDER MOVED INTO UNIT. From 2010, 2015, 2020	CSV File. Describes residential turnover by census tract. Particular interest in % of movers after 2019.	American Community Survey DPO4. Selected Housing Characteristics. US Census Bureau.
RACE. From 2010, 2015, 2020	CSV File. Particular interest in % change of non-white residents since 2010	American Community Survey B02001. Race. US Census Bureau.
2020 Cambridge Census Tracts	Public Shapefile.	Cambridge MA GIS Data Dictionary
EDUCATIONAL ATTAINMENT. From 2010, 2015, 2020	CSV File. Particular interest in % of non-degree holders.	American Community Survey S1501. Educational Attainment. US Census Bureau.
2020 Census Tracts in Boston.	Public Shapefile.	Analyze Boston (data.boston.gov)
Existing Bike Network	Public Shapefile	Analyze Boston (data.boston.gov)

3. Preliminary Methods
   1. Study map area
      i. Layers of 2020 Census tracts in Cambridge and Boston, Massachusetts focused on center-point at Mass Ave Bridge crossing over Charles River.
      ii. Create joins between census tract shapefiles and census demographic data CMVs (Rent Burden, Gross Rent, Year Moved, Race, and Educational Attainment)
   2. Calculate Change in Demographic information (Rent Burden, Gross Rent, Year Moved, Race, Educational Attainment)
      i. Create different map layouts for each, changing symbology to reflect % change
         1. Graduated color schemes with different colors for different % demographic changes
      ii. Create graphs demonstrating correlation between rent increases, rent burdens, length of tenancy (i.e., year moved), race, and educational attainment.

4. Proposed Study Area Map

Greater Boston Bicycle and Rapid Transit Infrastructure by Boston + Cambridge Census Tracts (2020)

Legend

- • MBTA Subway Station
- — MBTA Subway Line
- — Protected Bicycle Lanes
- ▢ BOSTON
- ▢ CAMBRIDGE

0   0.5   1   2 Miles