

Project Proposal for “Intro-Regional Migration and Transportation in New York Metro Area”

Team Members

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Overview:

This project is to capture the intra-regional migration trend in the New York Metropolitan Area in relation to transportation, and its effects on the local economy, employment, and housing affordability.

Why it's important:

On a personal level, we are interested in the transportation system and regional economics, and we chose this project because we want to use spatial data science to analyze the impact of the transit system on population migration patterns, and the effects of migration on the local economy, housing, and employment. In addition, both of us shared the connection with the New York Metropolitan Area since we have lived on the east coast, and would love to deepen our understanding of the urban system of the region.

On the broader scale, the recent trend of population decline in primary cities and suburban population growth in the American Snow belt (Northeast and Midwest), and the expansive rail services in "transit desert" (where residents need to walk at least 15 minutes to the nearest rail station) led us to consider the possible relationship between the two. The rezoning of the neighboring boroughs that allowed higher density in the early 2000s filled up the land near the train tracks, while job growth, and demand for affordable housing continue to push development outwards. The recent pandemic further led outwards migration of the New York City population to nearby cities, and we hope to capture this trend using map visualization to predict future migration trends between cities and suburbs. By analyzing the trend and impact, we want to inform policymakers of the potential outcomes of population migration on the local economy, housing costs, and job markets.

Spatial Scope:

This project focuses on the geography of the New York Metropolitan Area (the "Area"). Specifically, this region refers to the "NY-NJ-CT-PA" combined statistical area (CSA) which includes four states and 31 countries. The Area is the largest metropolitan area in the U.S. and includes many largest cities in their states such as New York City, Jersey City, and New Haven. Also, the U.S. busiest

commuter railways serve the Area, including MTA's Long Island Rail Road, NJ Transit Rail, and MTA's Metro-North. Therefore, the Area's dynamics of population, economy, and living environments are self-evident, which will provide us a huge amount of available data for the research and analysis purpose.

As for time span, this project will engage the data within the last 10 years because the regional developments and changes happen more frequently in the longer run.

Data Sources and Descriptions:

For now, four sets of data will be used in the research process: base map data, demographic data, economic data, and housing affordability data. Also, there are two kinds of data we are looking for: geospatial data (map data) and informative data (demographic, economic, and housing data). We hope to match informative data to geospatial data so that we can analyze and visualize them in a commutative way. Specifically:

1. Base Map Data:

All base data provides the fundamental framework for data analysis and representation, including the base map showing the boundaries of counties (which are our study areas) and the rail maps to show the entire commuter train network in the Area.

a. County boundary map:

- <https://catalog.data.gov/dataset/tiger-line-shapefile-2017-nation-u-s-current-county-and-equivalent-national-shapefile>

b. Transportation network map:

- New Jersey passenger rail lines:
<https://njogis-newjersey.opendata.arcgis.com/datasets/passenger-railroad-lines-in-nj?geometry=-74.812%2C40.611%2C-73.505%2C40.793>
- New Jersey passenger rail line stations:
<https://njogis-newjersey.opendata.arcgis.com/datasets/railroad-stations-in-nj>
- Long Island Railroad Map:
https://catalog.data.gov/es_AR/dataset/long-island-railroad-map

2. Demographic Data:

The data in this category will help understand the population distribution, changes (movement), and the population profile.

a. Census data of general population data: we will engage data of the number of population, education level, transportation model, etc. in order to understand the demographic profile of each county's population

- <https://data.census.gov/cedsci/table?t=Populations%20and%20People&g=3920000US095602001,095602005,095602007,095602009,345602003,345602013,345602017,345602019,345602021,345602023,345602025,34560202>

[7,345602029,345602031,345602035,345602037,345602039,345602041,365602005,365602027,365602047,365602059,365602061,365602071,365602079,365602081,365602085,365602087,365602103,365602119,425602103&y=2000&tid=DECENNIALDPSF22000.DP1&hidePreview=false](https://www.census.gov/data/tables/2018/demo/geographic-mobility/county-to-county-migration-2014-2018.html)

b. Migration census data:

- County-to-County Migration Flows (Census Data): we will look for the data who used to live in other counties live in the inner core of NY today to determine the international migration
<https://www.census.gov/data/tables/2018/demo/geographic-mobility/county-to-county-migration-2014-2018.html>

3. Economic Data:

The data in this category will help understand the population distribution, changes (movement), and the population profile. We will engage “GDP data by county” and “Personal Income and Employment data by county” and pair them with the spatial data.

- https://apps.bea.gov/iTable/index_regional.cfm

4. Housing Affordability Data:

The data in this category will help understand the population distribution, changes (movement), and the population profile. We will get the housing data for every county in our study area and match them with the spatial data.

a. Consolidated Planning /Comprehensive Housing Affordability Strategy Data:

- https://www.huduser.gov/portal/datasets/cp.html#2006-2017_query

Those data are just tentative. We will research and engage more data in-depth as we zoom in on the analysis.

Planned Analysis and Visualization:

In this project, we focus on the county level and the population flows between the inner core (Five boroughs or counties) and outer zones. We will match the economic, demographic, and housing data to each county chronologically. Through this analysis, we hope to see the gradual change over time and the movement of data density.

As for data visualization, we will map out the overall geography of the Area and its transportation network to show how the transportation system serves the Area. Also, we will illustrate all data points on the base map in a “before” and “after” style.

Expected Insights:

Through this research project, we hope to conclude and record the intra-regional migration trend in the New York Metro Area from the perspectives of the migration direction, speed, and nature. Furthermore, by exploring the relationship between population migration and the transit network,

we hope to be able to generalize the research findings to other metropolitan areas in the U.S. On the other hand, through studying the effects of migration, we hope to understand how we can respond and manage future migration and the challenges it will bring, especially in today's pandemic context.