Transit & Air Quality

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Introduction

Goal: Examine the **influence transportation infrastructure** has on the **air quality and climate** of Boston and surrounding neighborhoods.

Motivation

Understand **correlation** between **transport infrastructure, air quality & health of people**, since transport plays an essential role in the lives of Boston residents

Background

1. Poor air quality disproportionately affects communities in Boston.
2. Can combat poor air quality by transitioning to alternative energy sources, but complex!

Datasets

Proximity to roads (PPI Roads): Contains data about the spatial patterns of residents living in close proximity to roads with the highest levels of vehicle air pollution emissions across the MAPC region

- Population Density based on race
- PPI values: 0(lowest) - 5(highest)

Air Quality Data:AirNow API

- Latitude
- Longitude
- Zipcode
- Aqi
- Category Name

Census(Transport, Income, Household Size) Data (Census Bureau)

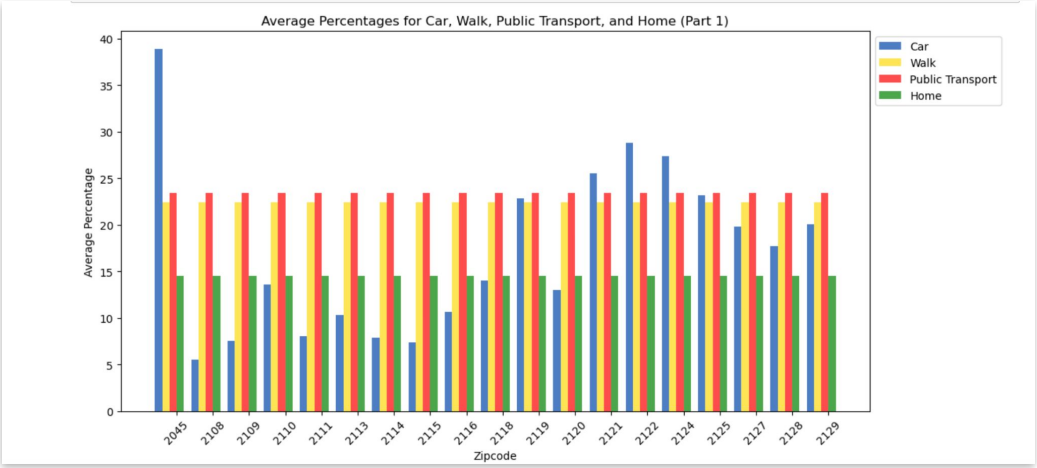
- % Boston population used cars, public transportation, walked or worked from home

Early Insights(Questions 1 & 3)

	CategoryName	Count
0	Good	15699
1	Moderate	625
2	Unhealthy for Sensitive Groups	47

In 2021:

- Yearly change was NOT a lot(AQI stayed in the range of 31-32)
- 96% of Boston's neighborhood reported 'Good' air quality in 2021.



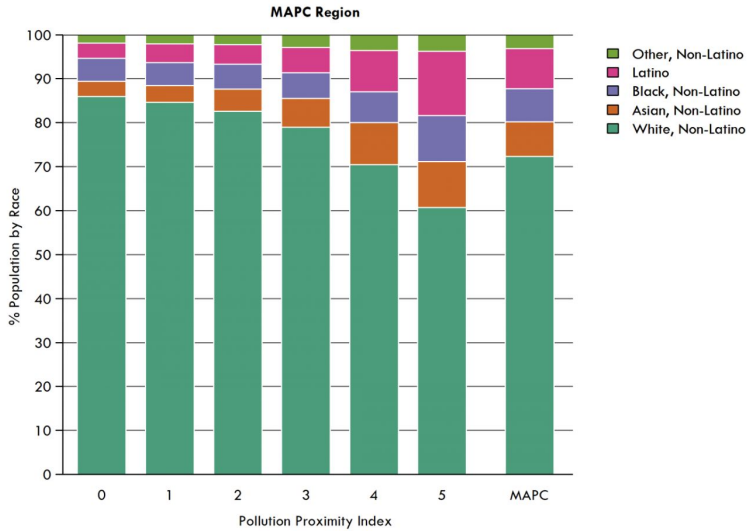
Car and public transportation: MOST common transport mediums

- **Further Study:** Impact of this on overall health and air quality

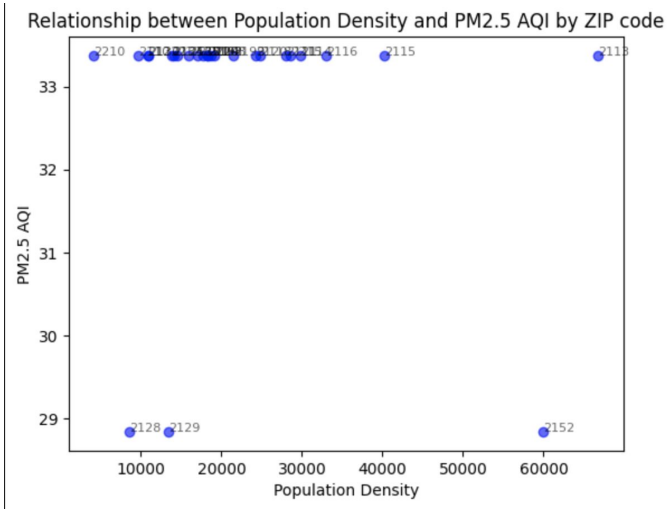
Early Insights(Question 2)

The share of residents of color increases with increasing PPI.

- Black and Asian residents: 30-40% higher than their share of regional population
- Latino residents is 60% higher.



- Though not a significant correlation, the most densely populated zip codes have relatively worse air quality



Challenges Encountered/Limitations

1. **Air Quality(AQI) Data:**
   - **Time Consuming**: data collected for >40 hours.
   - **Data pre-processing:** needed to perform a lot of data cleaning to ensure we get the most relevant data points.
   - **Average AQI:** Mean air quality values were similar across 38 zip codes.

2. **Project Feasibility**:
   - **Scope:** The 3 base questions can be analyzed or observed despite having similar values. Provides basic insights into both the overall air quality and demographics of Boston residents.

3. **Communication:**
   - **Timely Notice:** Receive specifications near deadlines, realignment of work.
   - **Responsiveness:** Faculty and TPMs could address student concerns in a more timely manner.

Next Steps

1. Explore possible **correlations** between zip code and AQIs

2. **PPI & transportation** infrastructure impacts

3. Yearly **AQI change & health** outcome

Extension Proposal

How does the health of people change according to the air quality of the district they live in?

- zipcode vs. asthma rates

Does the air quality change based on the crime rates of the district?

- zip code vs. crime index