



# The Long Way Round

An analysis on transit deserts and deficiencies in The Bronx

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# Project Question(s)

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Where are the conventionally defined “transit deserts” in the Bronx and does this definition adequately describe the state of transit in the Bronx?

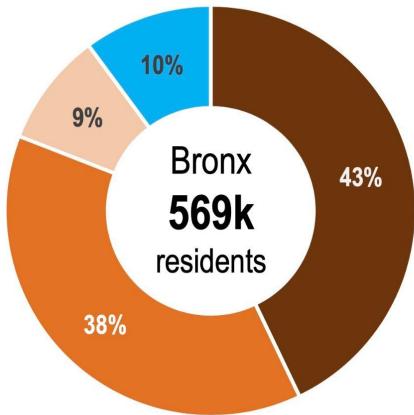
- Is there a significant spatial pattern to these transit deserts?



## The Borough Far Uptown

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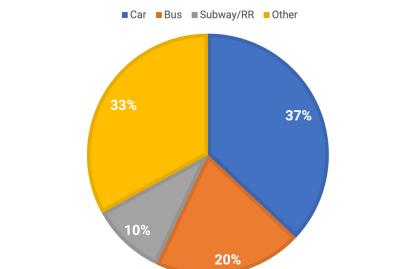
- The Bronx is the northernmost of all NYC Boroughs connected to the rest of the city via bridges and tunnels to Manhattan
- While a large portion of Bronx residents work in Manhattan, the majority do not
- Commuting for those who live and work in the Bronx looks very different compared to those who work elsewhere



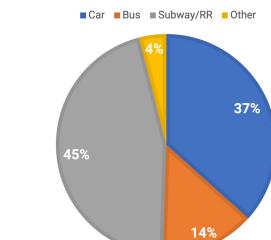
**NYC Residents' Workplace**

- Within home borough
- In Manhattan
- In a different Non-Manhattan Borough
- Elsewhere in the Region

**WORKERS LIVING/WORKING IN THE BRONX**



**WORKERS LIVING IN THE BRONX COMMUTING ELSEWHERE**



## Motivation

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- I lived in the Bronx last summer, I saw first hand how great the NYC Subway system was for getting around (around usually meaning down to Manhattan and back)
  - I also experienced how bad New York traffic can be in a car
- New York is known for being the one American City where public transit is *the* mode of getting around so a transit study would be appropriate
- Hopefully, this project show the need for more intraborough transit options in New York and generally a reexamination of circumferential transit routes in other cities

# Just Out of Reach

While the New York City Subway system provide transit access to millions across the city, many in the outer-boroughs still live in areas practically unaccesible from any train station.

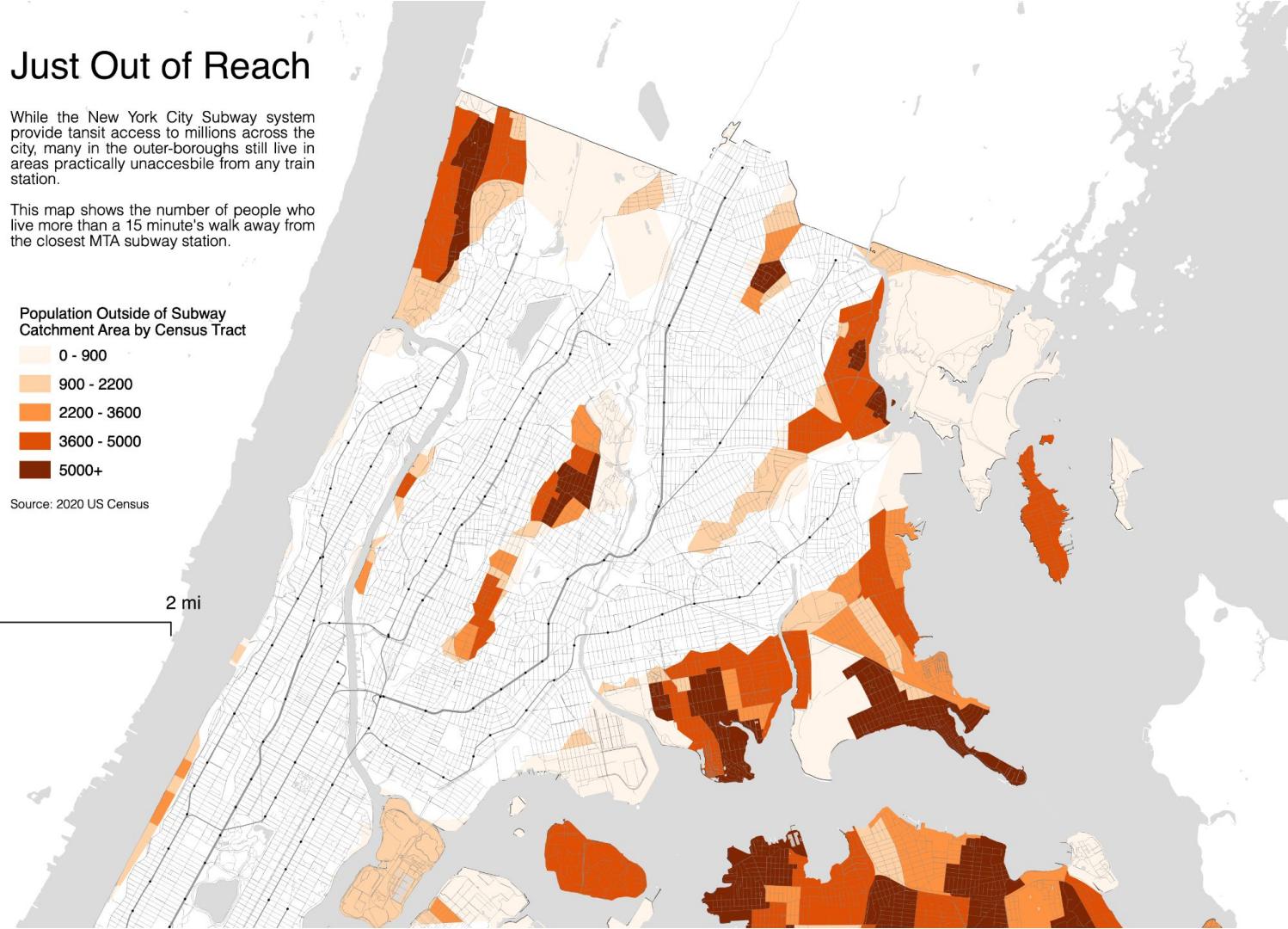
This map shows the number of people who live more than a 15 minute's walk away from the closest MTA subway station.

Population Outside of Subway  
Catchment Area by Census Tract

- 0 - 900
- 900 - 2200
- 2200 - 3600
- 3600 - 5000
- 5000+

Source: 2020 US Census

0 2 mi



# New York City Subway Diagram



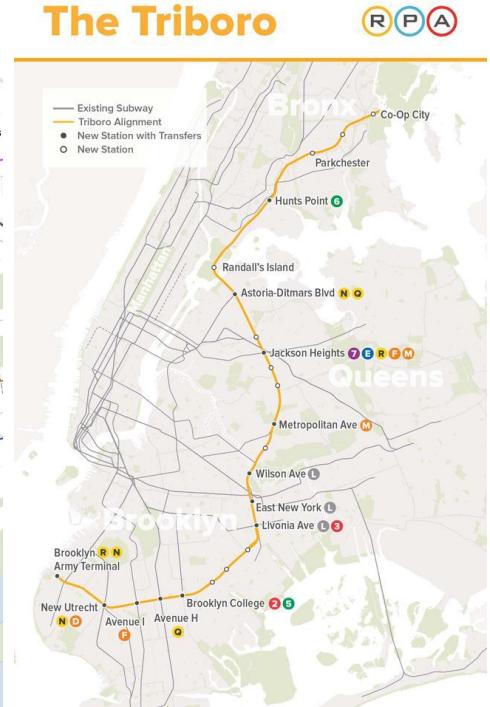
# The Borough Far Uptown

- The “Interborough express” is currently in the works connecting Brooklyn and Queens in an attempt to better increase connectivity
- This plan is disappointing to many in the Bronx as this does not follow through with the original Triboro plan



Current Plan

## The Triboro



Original Triboro Plan

## Data Sources

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Google Maps API



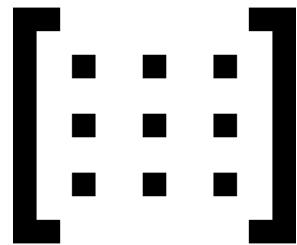
MTA Station and GTFS Data

## Research Method

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1. Determine Points



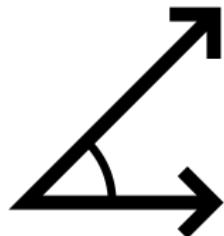
2. Create origin-destination matrix



3. Find travel times for each O-D pair with Google Maps API

## Research Method

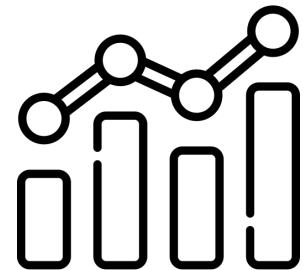
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4. Determine north-south and east-west components



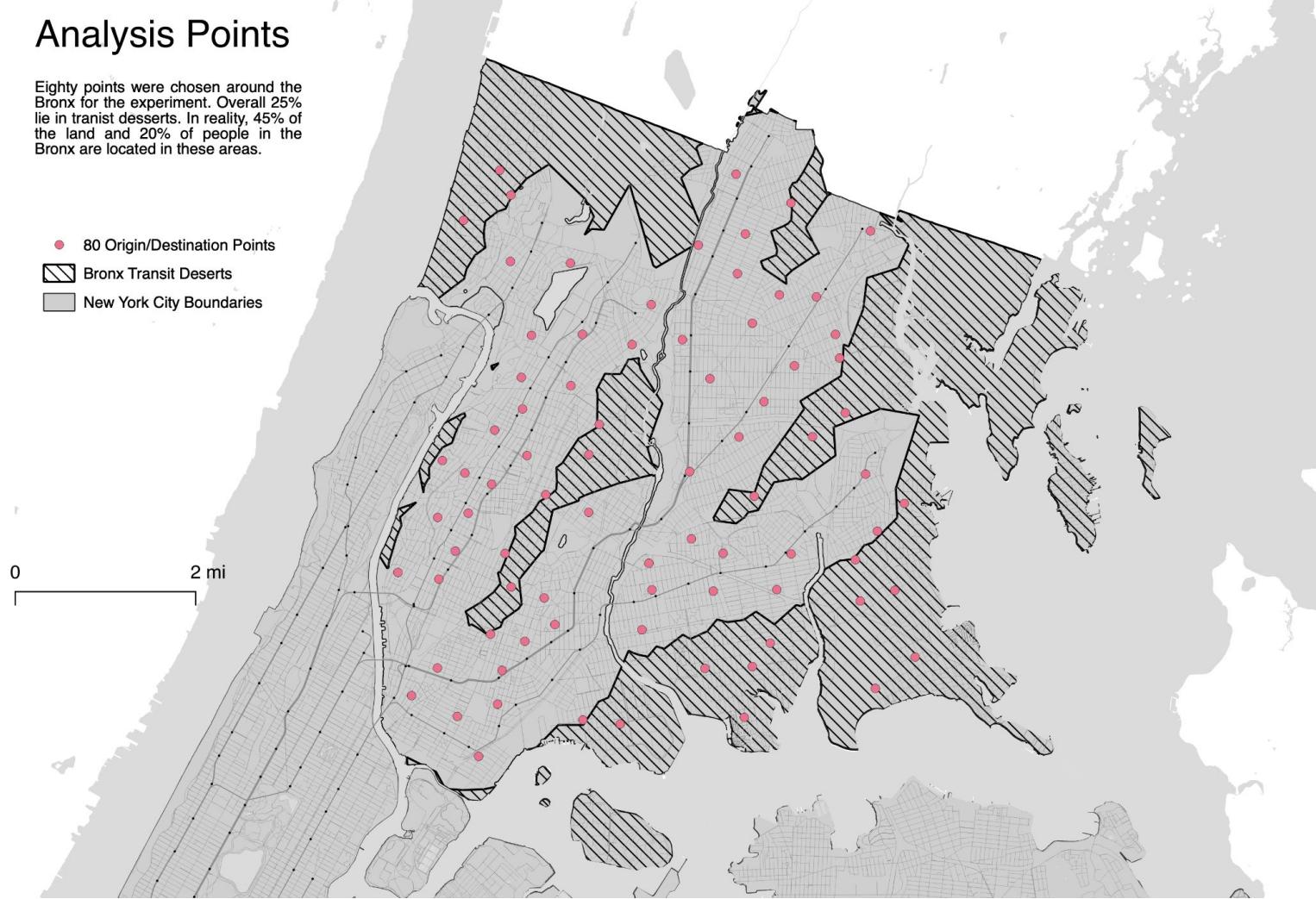
5. Using said components, create a metric to evaluate each pair



6. Test for statistical significance between the two axes

# Analysis Points

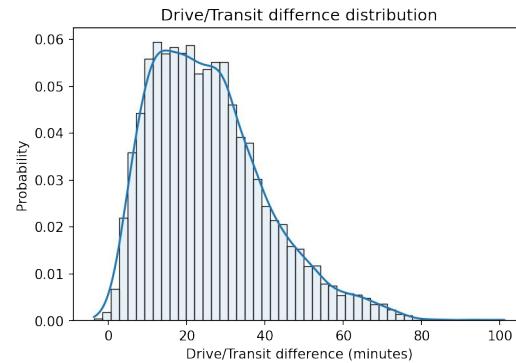
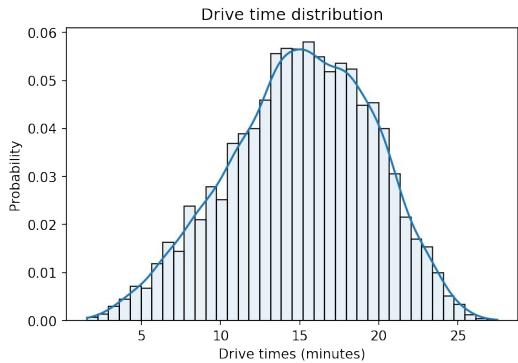
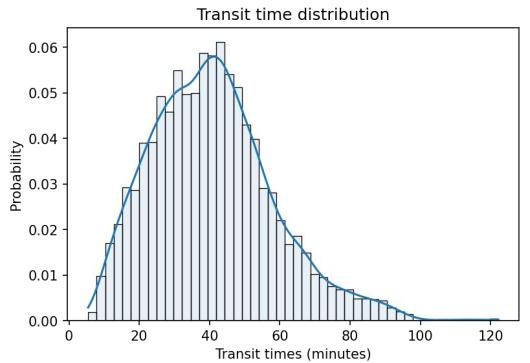
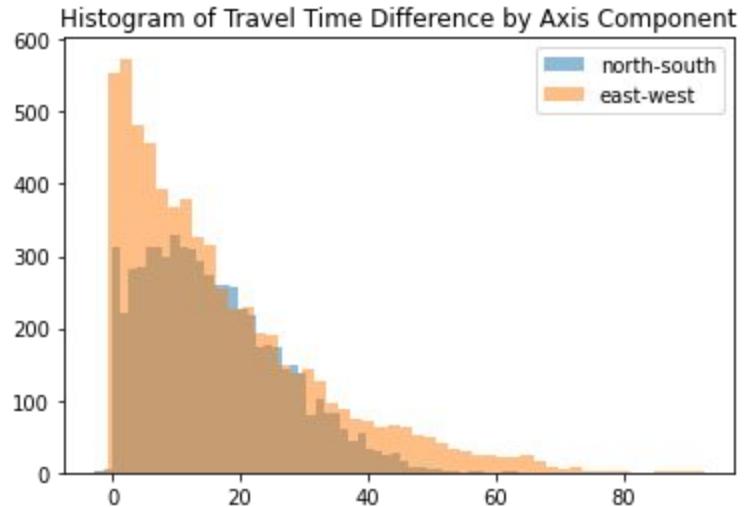
Eighty points were chosen around the Bronx for the experiment. Overall 25% lie in transit deserts. In reality, 45% of the land and 20% of people in the Bronx are located in these areas.



# Results

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- On average, journeys by transit were 3 times as long as journeys by car in the Bronx and on average 30 min longer
- The “North-South” metric average was 18.28 while the “East-West” metric average was 20.83\*
  - This difference was statistically significant

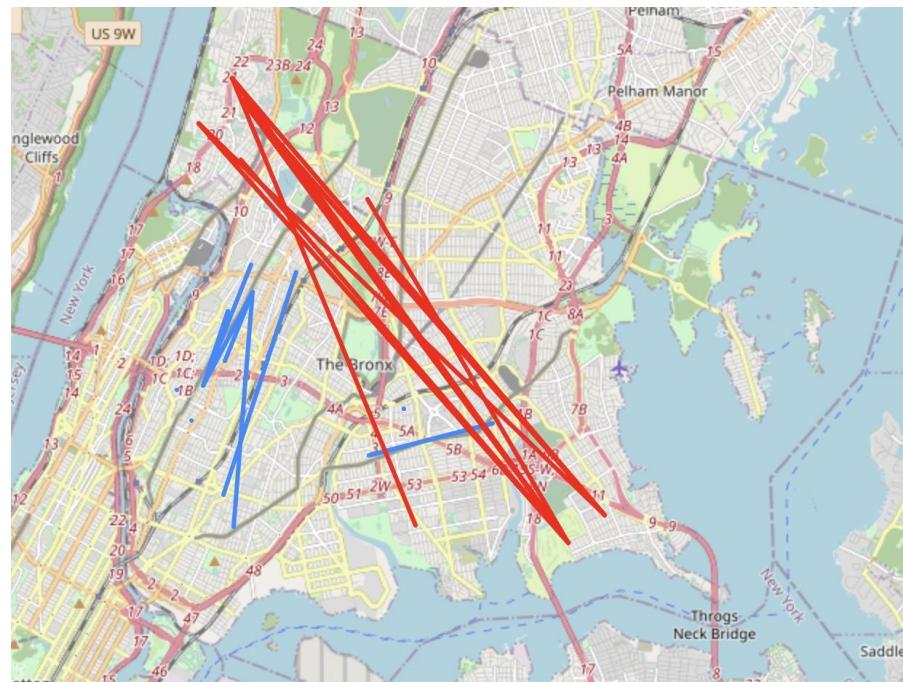


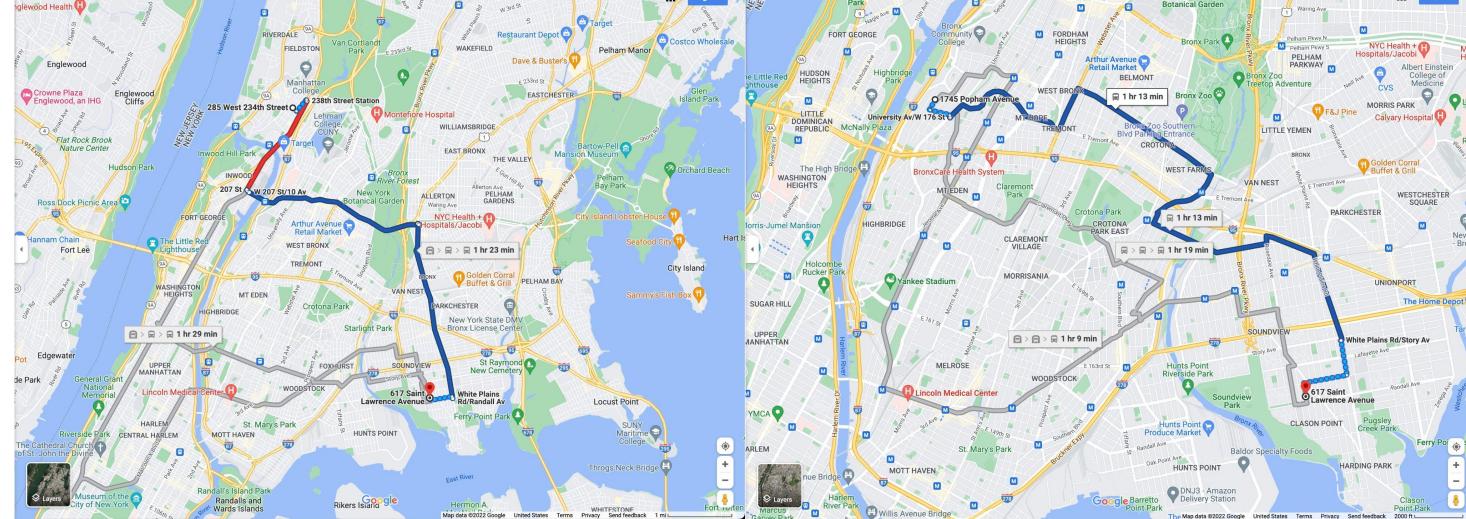
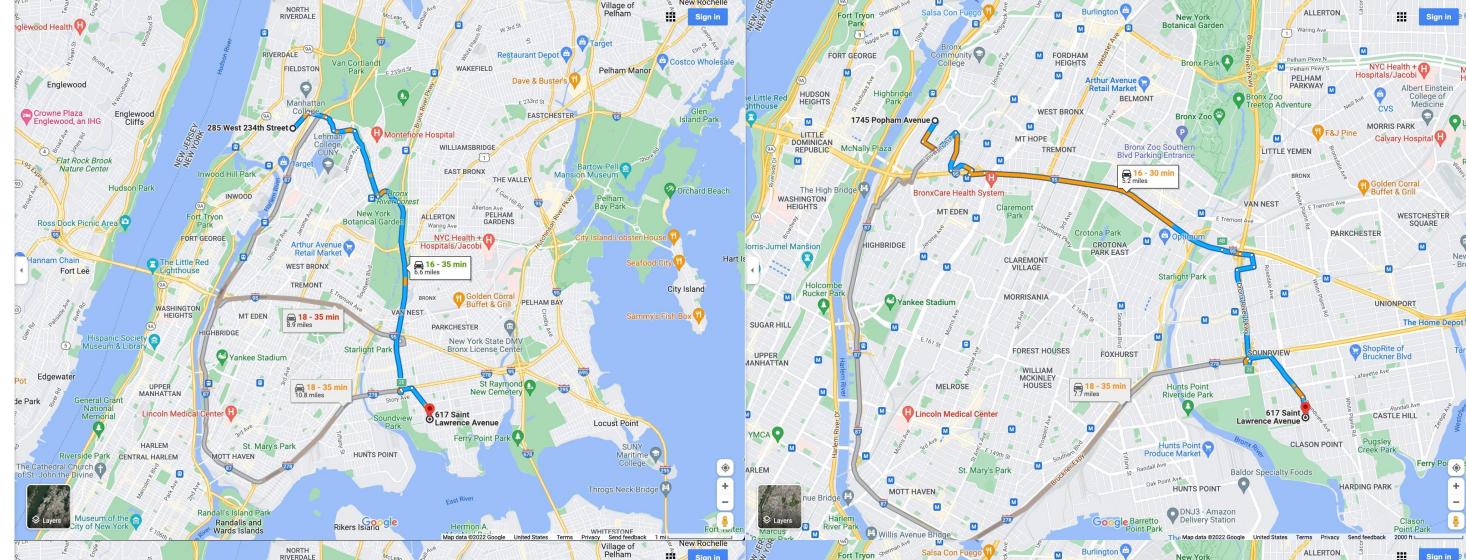
\*Analysis was done among the top 75% of trips by travel difference

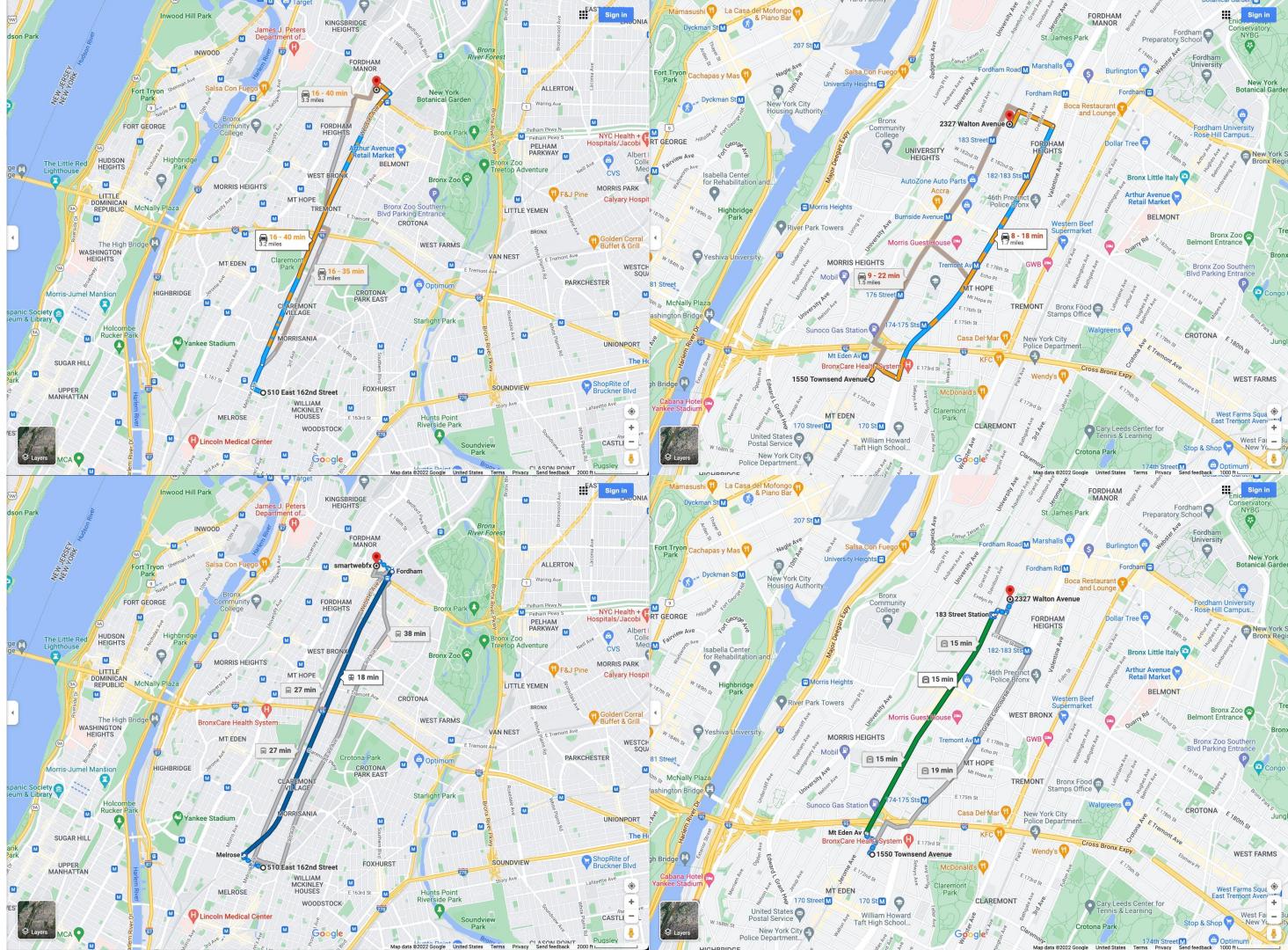
# Results

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- All of the trips where transit beat cars were along subway lines
- The longest differences were found between points that were in “transit deserts”
- Typically for long east-west journeys, Google Transit routed people on Buses rather than trains which often lack their own right-of-way



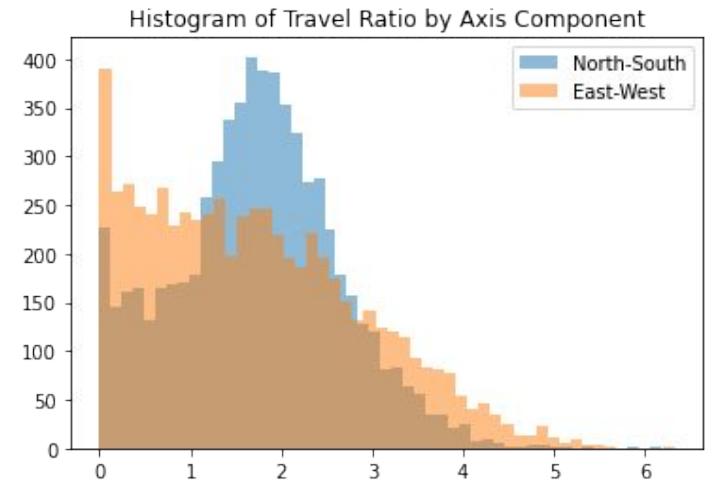
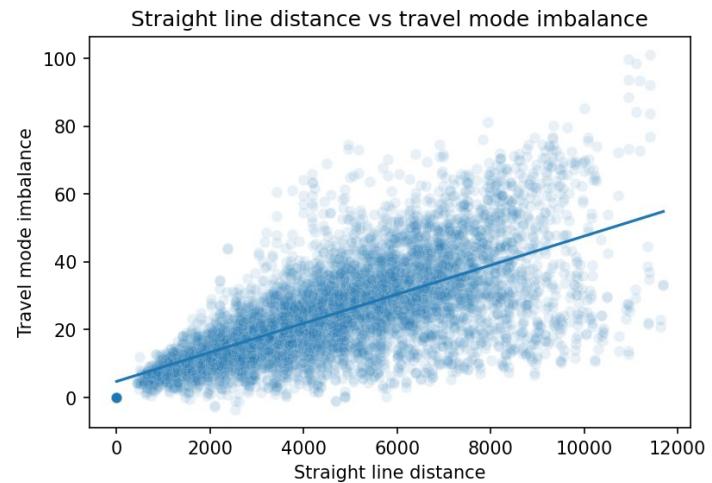




# Results

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- Generally, the variance of the time difference between transit and car got larger as the distances got longer as one might expect
- To account for this, ratios between car and transit times were compared with the same component analysis method
- The North-South ratio component averaged 1.89 while the East-West component averaged 2.03\*
  - Also a statistically significant result



\*Analysis was done among the top 75% of trips by travel difference

## Conclusion

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- Generally, it is more difficult to travel east-west than it is to travel north-south in the Bronx
  - This result isn't only limited to conventional transit deserts also this drive-transit disparity is noticeably longer
- Lack of strong interborough connectivity could pose a challenge to the 43% of Bronxites who work within their home borough
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## Future Analysis

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- Hope to in the future access or generate some demand data to see actual paths people might take
- Where might an intra- or inter-borough express line make the most sense
  - Especially if it is linking with the other outer-boroughs
- Only 24% of NYC Subway stations are accessible, what if we limited analysis to just those stations how much worse does travelling around look