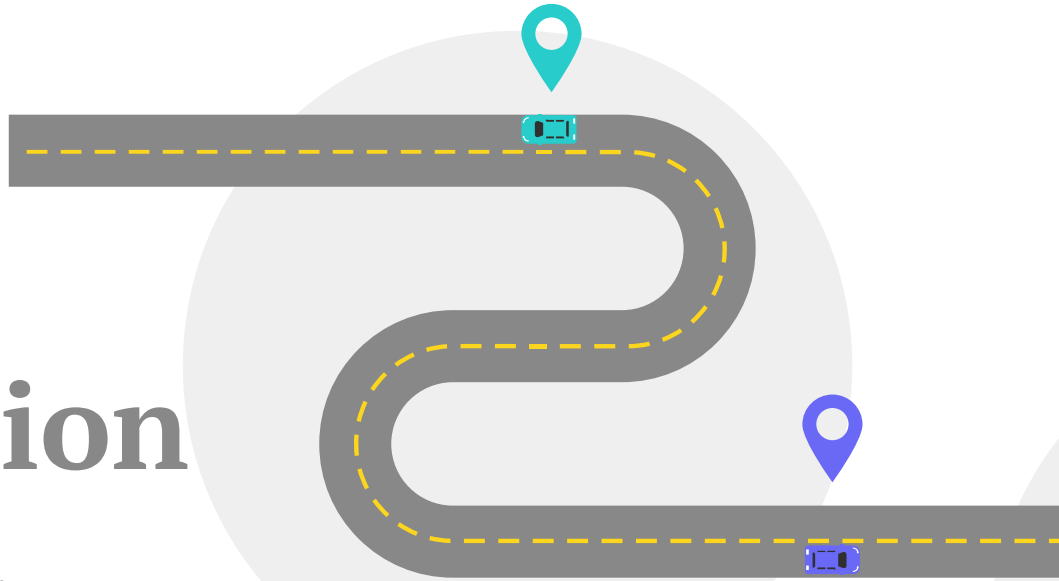
Public v. Private Transportation



Group 1:
Marisa Lala, Viktor Spasic, Laura Walkup, Kevin Xiao

Agenda

01

Introduction

Our Main Questions

02

Data Preparation

Methods that we used

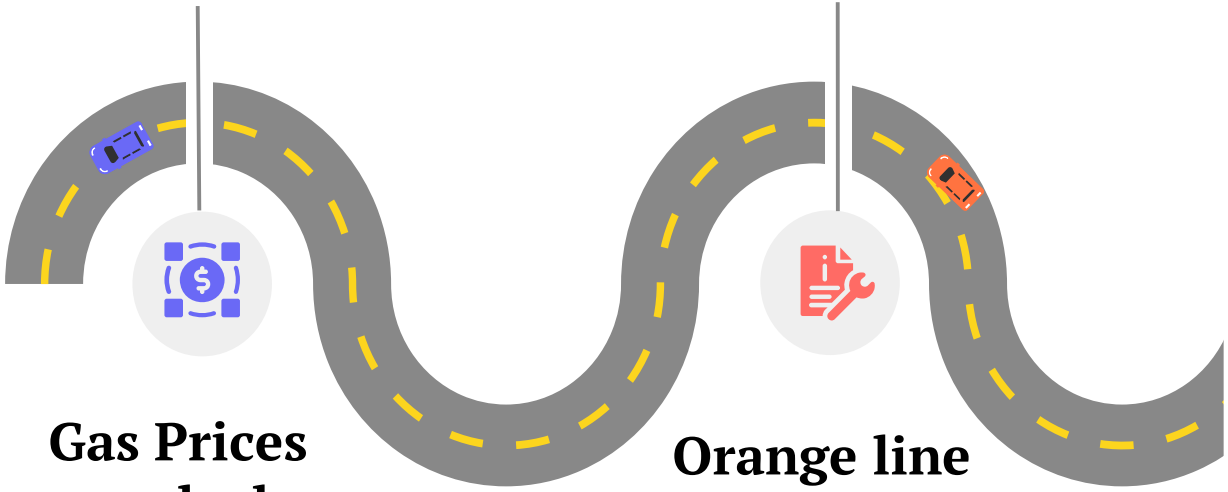
03

Conclusion

Were we able to answer the questions?

Our Questions

June 13, 2022



Gas Prices peaked

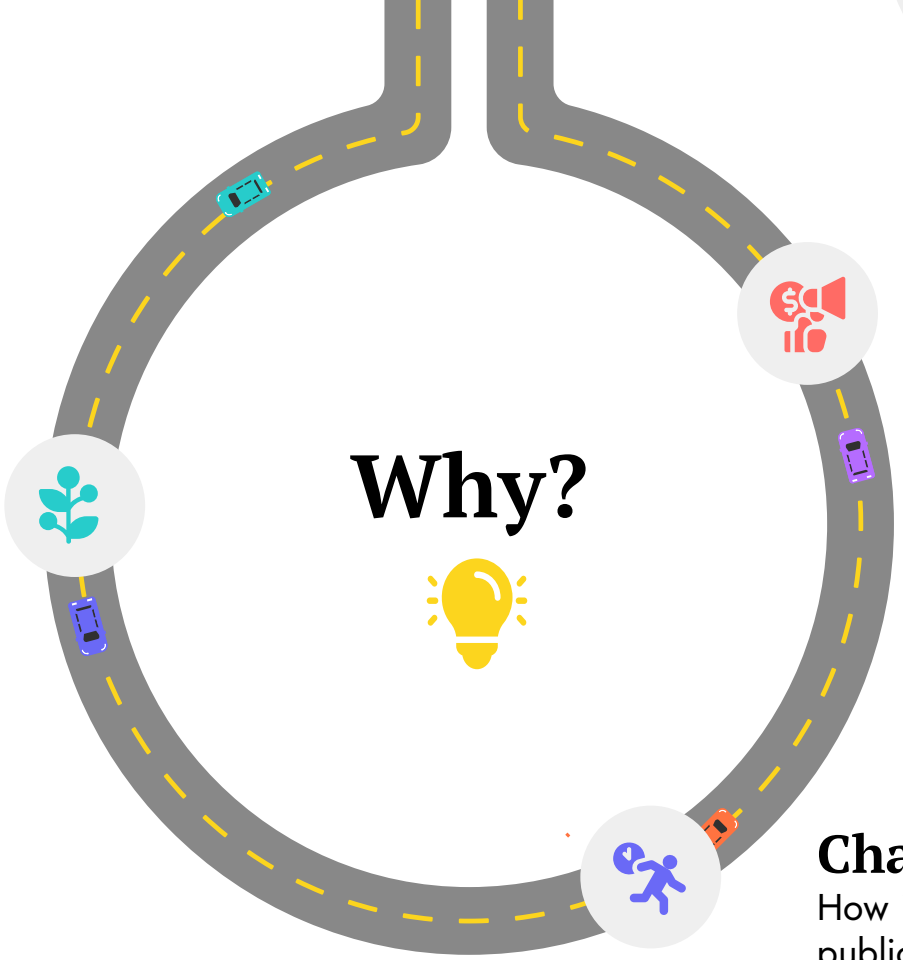
What was the effect on public and private transportation?

August 19,2022

Orange line shut down

What was the effect on public and private transportation?

Why?



Goals

Boston aims to be carbon neutral by 2025

Price affect

Sensitivity of population by increases in gas prices

Changes

How inconvenience of public transportation affect people's behaviour

Why cell-phone data fits our interest?

POIs selection

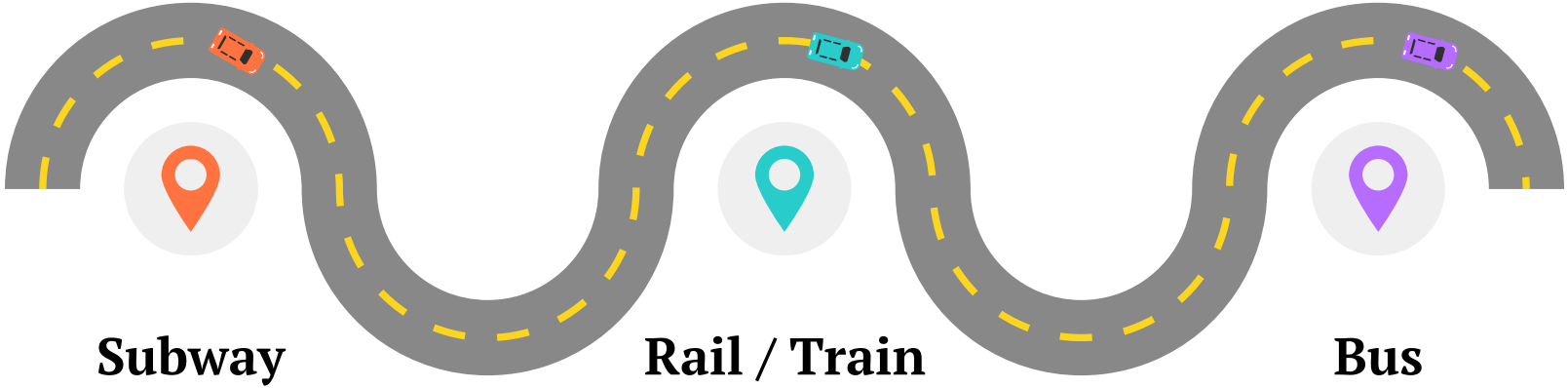
Private Transportation

Using Gas Stations to represent the traffic by private vehicles

Public Transportation

Using a number of stations/route to represent the traffic by public methods

Public Transportation?



Subway

Top Category:
Transit & Ground
Passenger Transportation

Rail / Train

Top Category:
Rail Transportation

Bus

Top Category:
Interurban and Rural Bus
Transportation

#1

Is our data set biased?

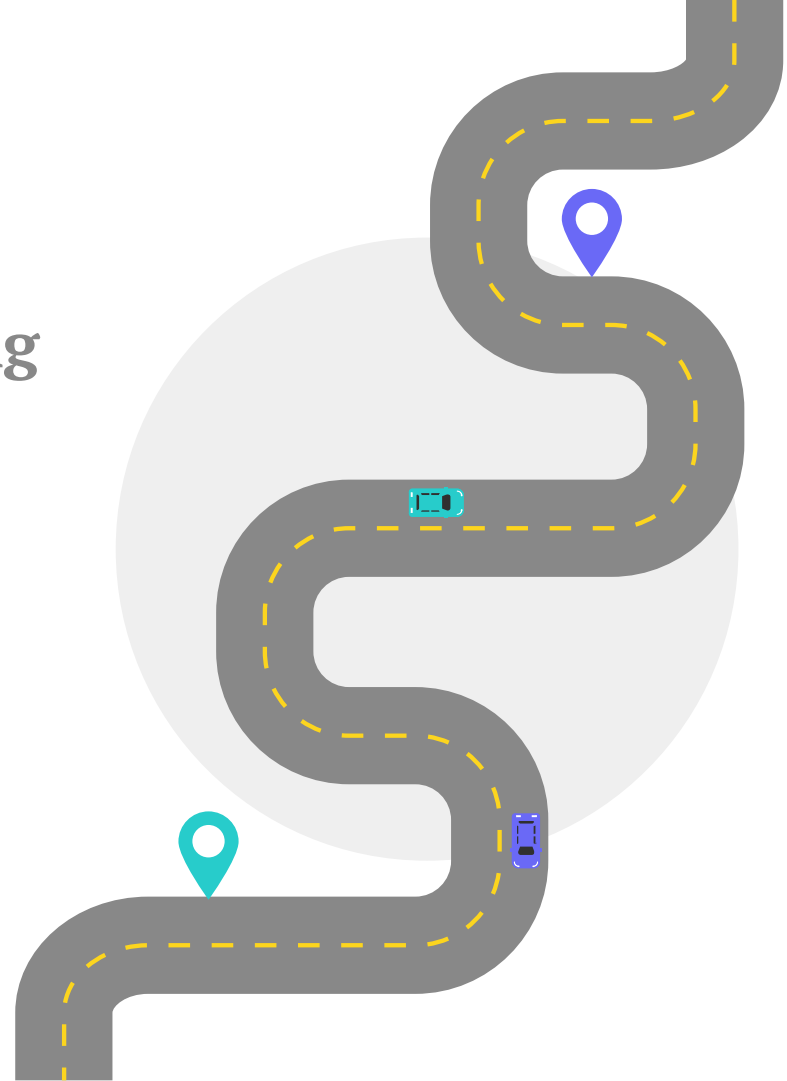
Using Chi-square test to explore

Preparations

Loading, joining, and cleaning

The steps we take before conducting Chi-square test:

- Loading the data
- Joining the data frames
- Inspecting and cleaning the data we need



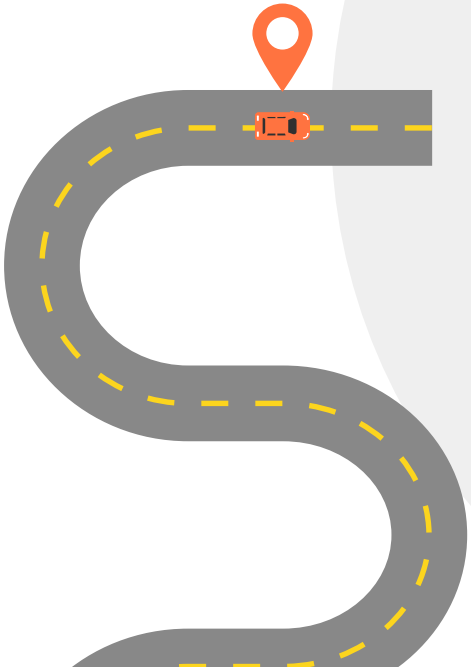
Missing values?

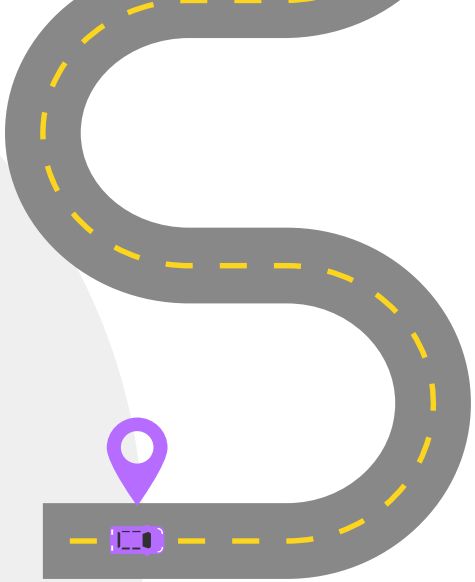
12

12 MBTA stations were left out with no top_category values

Observed vs. Expected

Private	20 POIs Observed	113 Gas Stations
Public	52 POIs Observed	265 Stations/Routes
Total	72 POIs Observed	378 Total POIs in population





0.153

Chi-square statistics

0.694

P-value

Do not reject H_0

Hypothesis 0: the proportions of private vs. public POIs in the sample are the same with the proportions in population

#2

Data cleaning/manipulation

Analysis of the trend required:

- Successful Chi-square test result
- Looking at visits to gas stations and public transportation POIs
- Assigning top category values to rows with missing top category

Next steps

- Aggregate the raw visit counts
  - Create a new category field to replace top_category
  - New column to divide top_category values into two categories:
    - *Private*
    - *Public*
- Translate the date field into the corresponding number of the month

Scaling

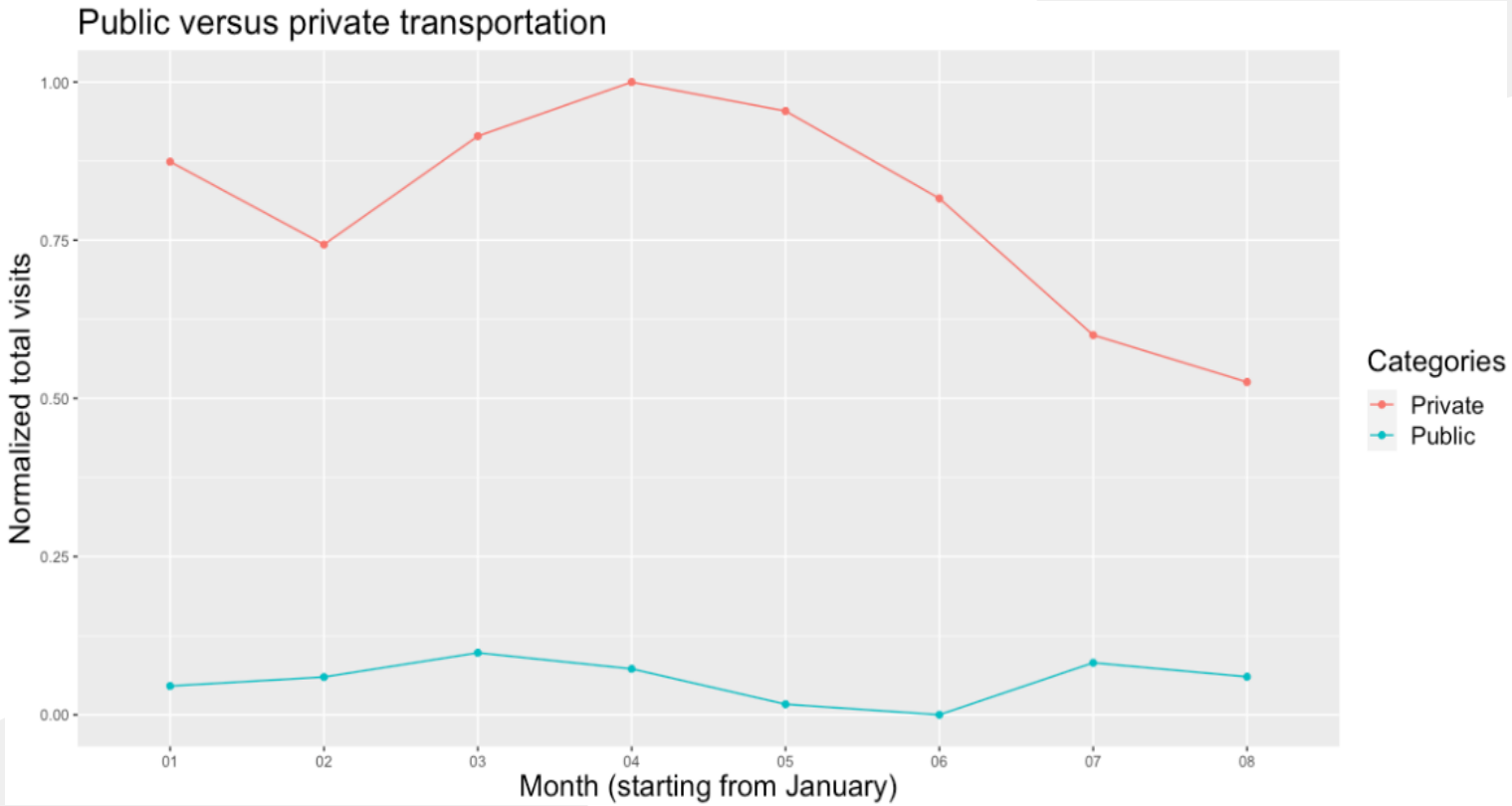
No scaling

Max total visit		2768
Min total visit		370

Normalization

Max total visit		1
Min total visit		0

Graphic Results



Some Considerations

POI Category

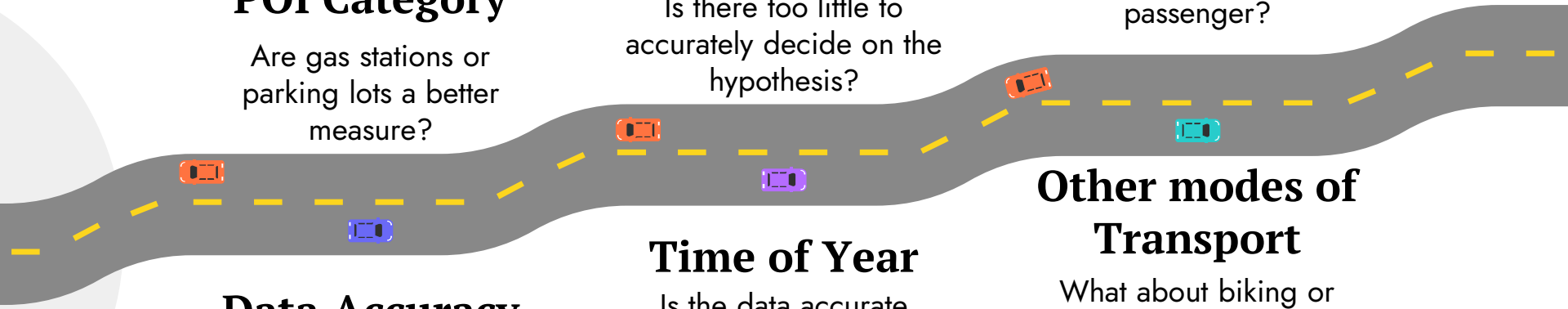
Are gas stations or parking lots a better measure?

Observation Number

Is there too little to accurately decide on the hypothesis?

Passenger Number

Is there more than one car passenger?



Data Accuracy

Is there overlap from other businesses?

Time of Year

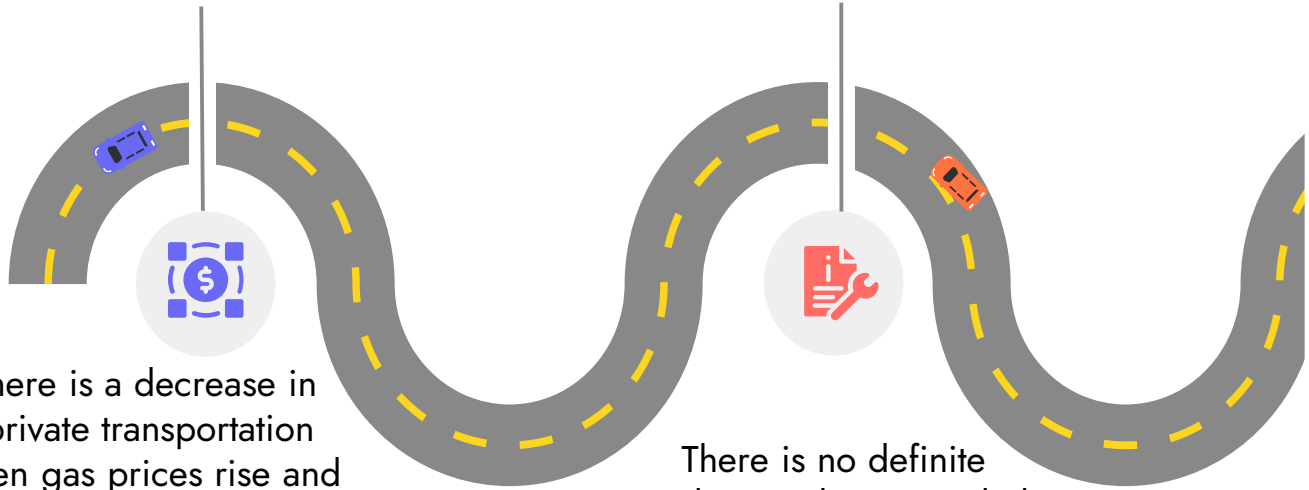
Is the data accurate considering population fluctuations?

Other modes of Transport

What about biking or walking?

Where our Questions Answers

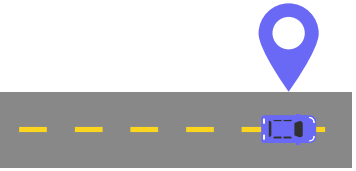
Gas Prices peaked



There is a decrease in private transportation when gas prices rise and consumers seems sensitive to price

Orange line shut down

There is no definite conclusion, there is a slight rise in public transport and no rise in private transport



Thank you!

Any Questions?