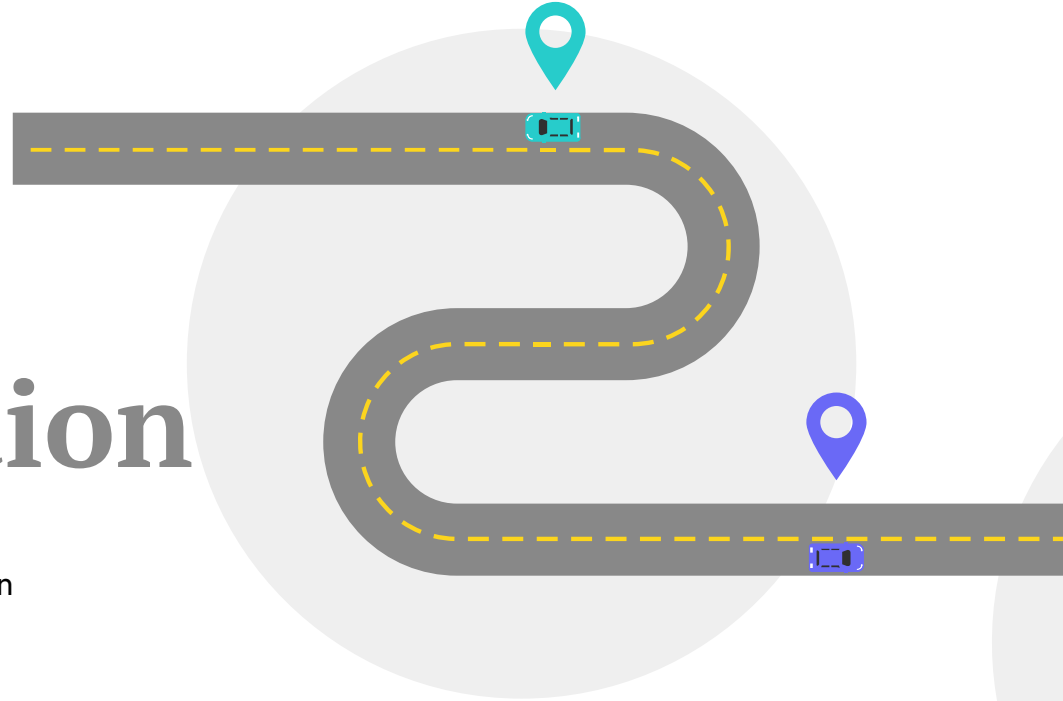


Public v. Private Transportation

Group 1:

Marisa Lala, Viktor Spasic, Laura Walkup, Kevin
Xiao



Agenda



01

Introduction

Our Main Questions



02

Data Preparation

Methods that we used



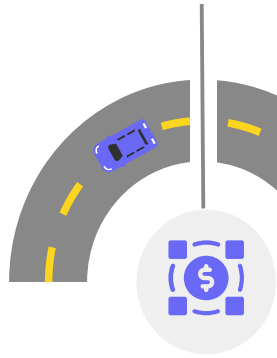
03

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



The background features a light gray surface with stylized winding roads in dark gray with dashed yellow lines. A small orange car is on a road on the left, and a small purple car is on a road on the right. Large, light gray circular shapes are also present in the corners.

**Why cell-phone data fits
our interest?**

POIs selection



Private Transportation

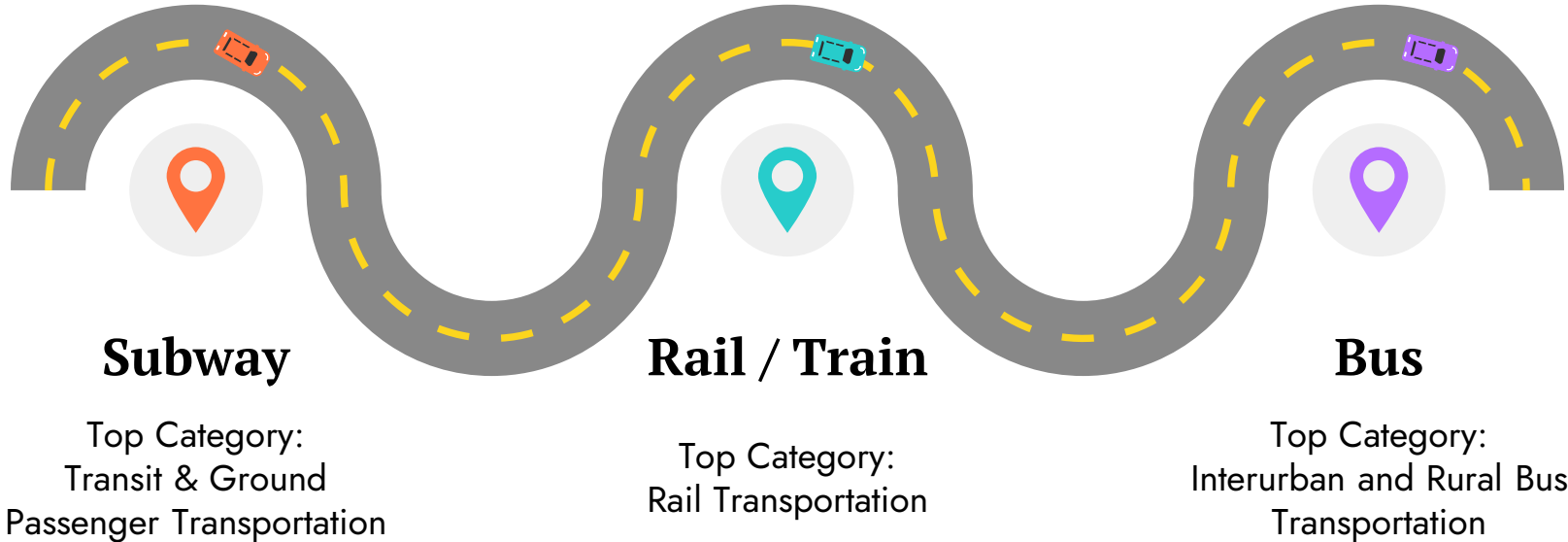
Using Gas Stations to represent the traffic by private vehicles



Public Transportation

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

Public Transportation?



The background features a light gray color with several stylized, winding road segments in a darker gray. Each road has a dashed yellow center line. Three small car icons are placed on these roads: an orange car on a road in the bottom left, a purple car on a road in the top right, and a small blue car on a road in the top center. Large, light gray circular shapes are also scattered in the background.

#1

Is our data set biased?

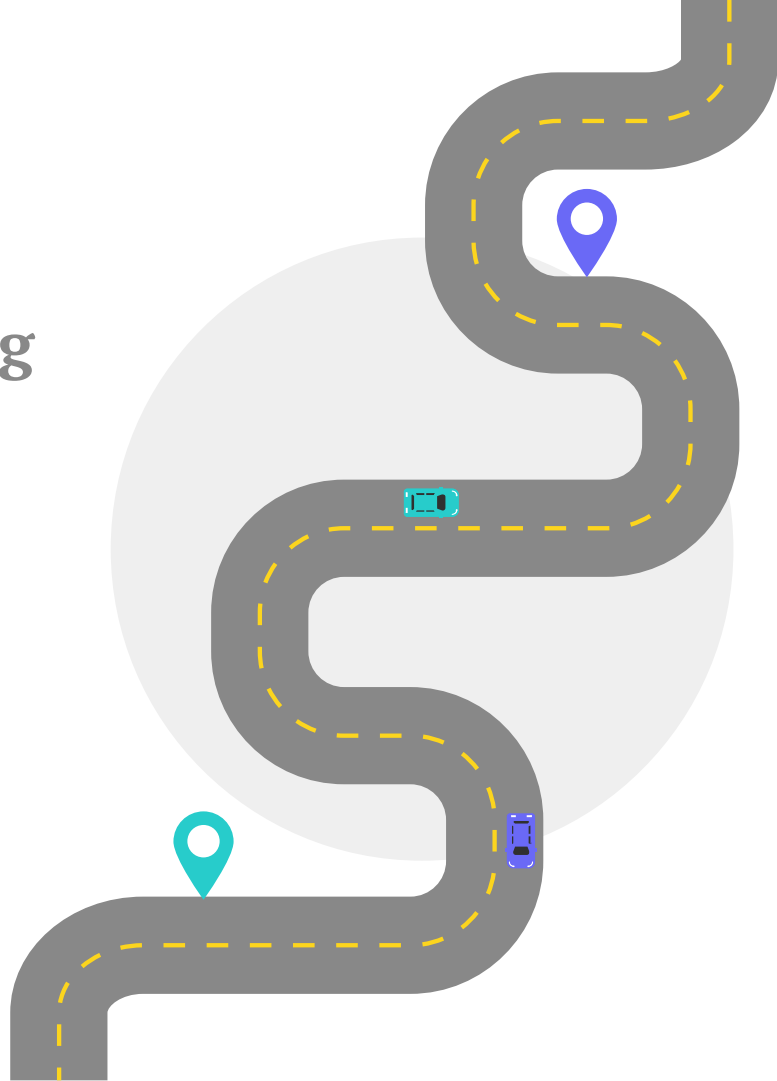
Using Chi-square test to explore

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



The slide features a light gray background with decorative elements: stylized gray roads with yellow dashed lines curving at the top and bottom, and small teal and blue car icons on these roads. A large, bold black text "Missing values?" is centered in the upper half. Below it, the number "12" is displayed in a very large, bold black font. At the bottom, a line of smaller black text explains the missing values.

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

A decorative graphic on the left side of the slide. It features a grey winding road with a dashed yellow center line. An orange car is driving on the road, and an orange location pin is positioned above it.

0.153

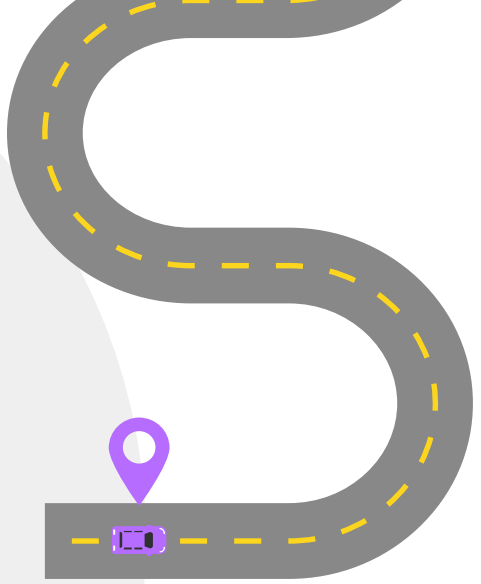
Chi-square statistics

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

A decorative graphic on the right side of the slide. It features a grey winding road with a dashed yellow center line. A purple car is driving on the road, and a purple location pin is positioned above it.

The background features stylized, winding grey roads with dashed yellow lines. A small orange car is on a road in the bottom left, and a small purple car is on a road in the top right. Large, light grey circles are also present in the background.

#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

➤ No scaling

	Max total visit		2768
	Min total visit		370

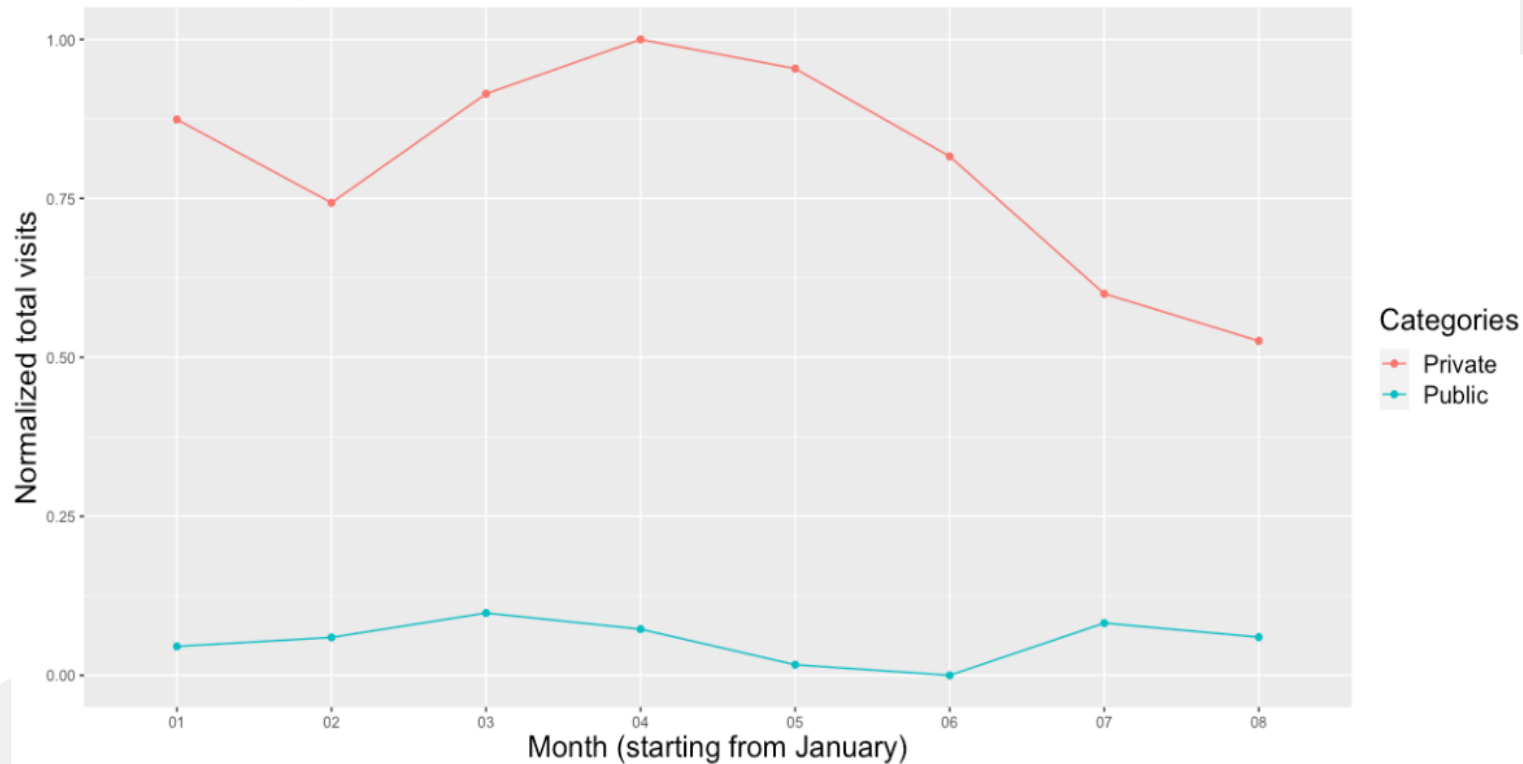
➤ Normalization

	Max total visit		1
	Min total visit		0

Scaling

Graphic Results

Public versus private transportation



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

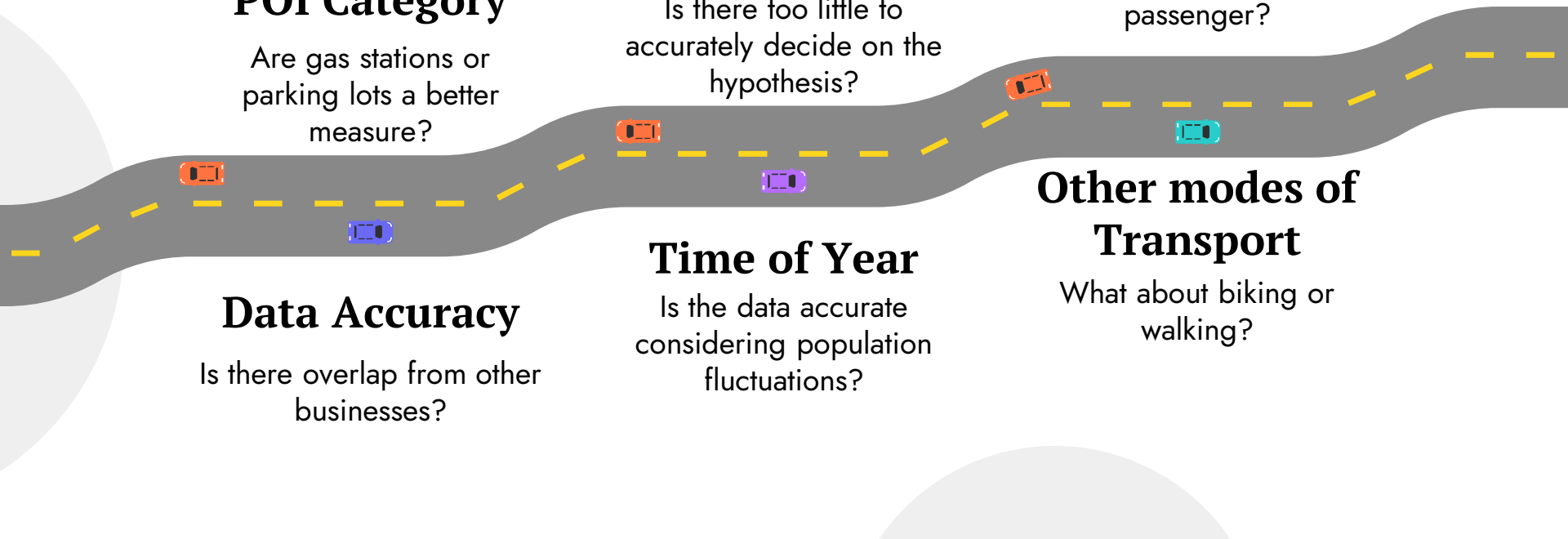
Is there overlap from other businesses?

Time of Year

Is the data accurate considering population fluctuations?

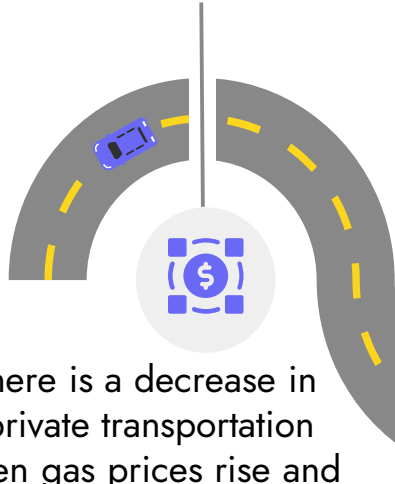
Other modes of Transport

What about biking or walking?



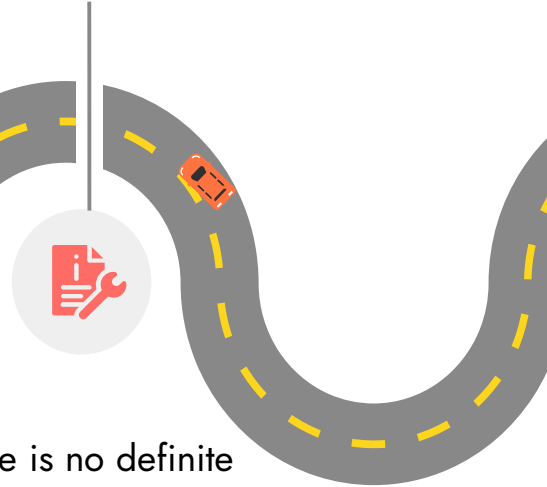
Where our Questions Answers

**Gas Prices
peaked**

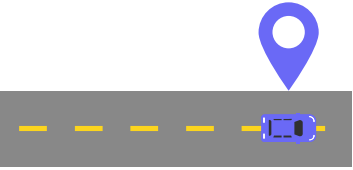


There is a decrease in private transportation when gas prices rise and consumers seems sensitive to price

**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?

