

# The Impact of Covid-19 on Travel



Data Science Major Capstone  
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## Motivation

I found it both relevant and of interest to look into the potential effects Covid-19 had on travel trends, and how these trends differ based on sociodemographic factors.

## Research Question

How has Covid-19 impacted daily travel trends within Chicago, Washington DC, Dallas, and Seattle?

## Data

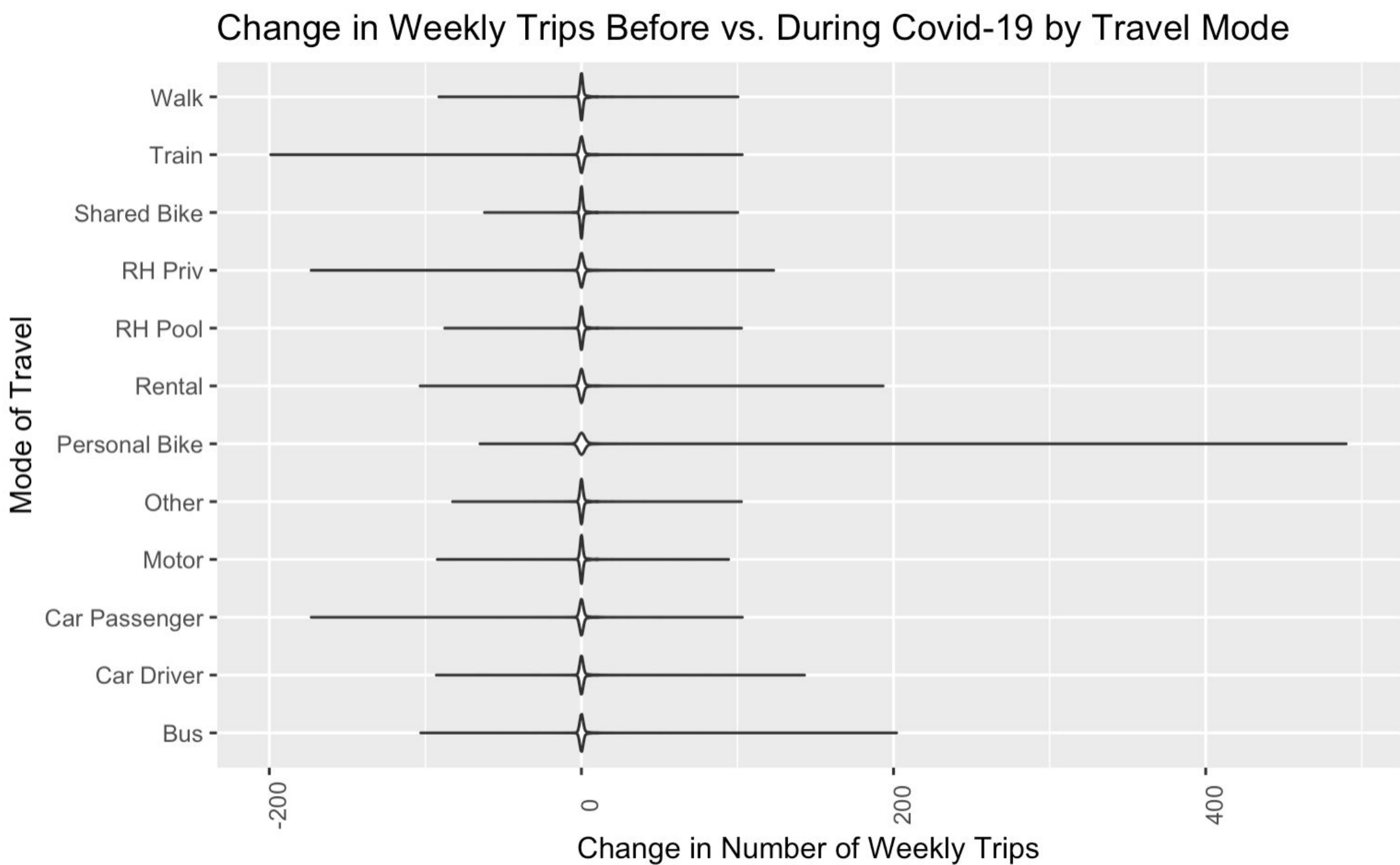
The data was collected as a survey sent to 4000 randomly selected participants in 4 major U.S. cities. The survey was sent out twice, once before and once during Covid-19 to the same cohort of participants. The question of interest in the survey was:

*In the past week, how many trips did you make using each of the following transportation modes?*

Of 3993 respondents, 2593 (64.9%) traveled *less*, 884 (22.1%) traveled *the same*, and 488 (12.2%) traveled *more* during Covid-19 than they had before.

## Change in Trips

Weekly # trips before Covid-19 - Weekly # trips after Covid-19



Mode	Before	After	% Change
Train	0.0161	0.0325	-0.0163
Bus	0.0220	0.0425	-0.0205
Car Driver	0.5441	0.5060	+0.0380
Car Passenger	0.1557	0.1461	+0.0096
Rental	0.0156	0.0126	+0.0030
RH Private	0.0312	0.0537	-0.0225
RH Pool	0.0124	0.0186	-0.0061
Shared Bike	0.0081	0.0093	-0.0011
Personal Bike	0.0336	0.0285	+0.0051
Walk	0.1529	0.1479	+0.0049
Motor	0.0166	0.0109	+0.0056

## Discussion

Travel is understood as a “derived demand” meaning it stems from the activities at the destination rather than the travel itself. So, while overall transportation usage declined, people did not appear to be switching modes of transportation, but those who could appeared to be dropping their preferred method of travel completely.

## Model

*Which sociodemographic factors contribute to best predicting the change in number of trips before and during Covid-19?*

Stepwise Regression → AIC criterion

## Results

$$\widehat{\text{Change Mode Travel}} = \text{Male} + \text{HHCars} + \text{Student} + \text{ColDeg} + \text{EssWkr} + \text{Seattle} + \text{Black} + \text{EmpBenParking} + \text{PTinfrequent} + \text{PTsuperuser} + \text{PTnonuser}$$

5 fold cross-validation score:

## Future Considerations

In the future, I would like to break down my analysis by the four major U.S. cities. I would also like to look at how working from home abilities and employment status affected individual travel trends.