

EVALUATING THE IMPACT OF URBAN TRANSPORTATION POLICIES: SPEED LIMIT CHANGES IN SÃO PAULO, BRAZIL

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Introduction

- From 1970 to 1996, population of São Paulo doubled and the number of vehicles increased six-fold
- In 2015, the car speed limit on the main urban highways in São Paulo (*marginais*) were reduced from 90 km/h to 70 km/h. This change affected 46 km of road and more than 1.2 million trips a day.
- In 2017, the speed limit was reverted to pre-2015 levels.
- Improving the speed of travel in large and congested cities could be very beneficial in reducing fuel use and emissions (Anas and Timilsina, 2009)
- Increasing the speed limit is also associated with increased traffic accidents and elevated pollution concentrations. (van Benthem, 2015)

Research Questions

What is the welfare effect of a speed limit change?

Main benefit: Increased consumer surplus from reductions in travel time

Main cost: Value of damages from additional traffic accidents

Descriptive Statistics

Mode	Distance (km)		Duration (min)	
	Mean	Total (Millions)	Mean	Total (Millions)
Public	14.17	153.6	67.80	735.3
Private	10.32	81.8	23.16	183.5
Walking	1.22	8.3	12.50	84.7

Empirical Method

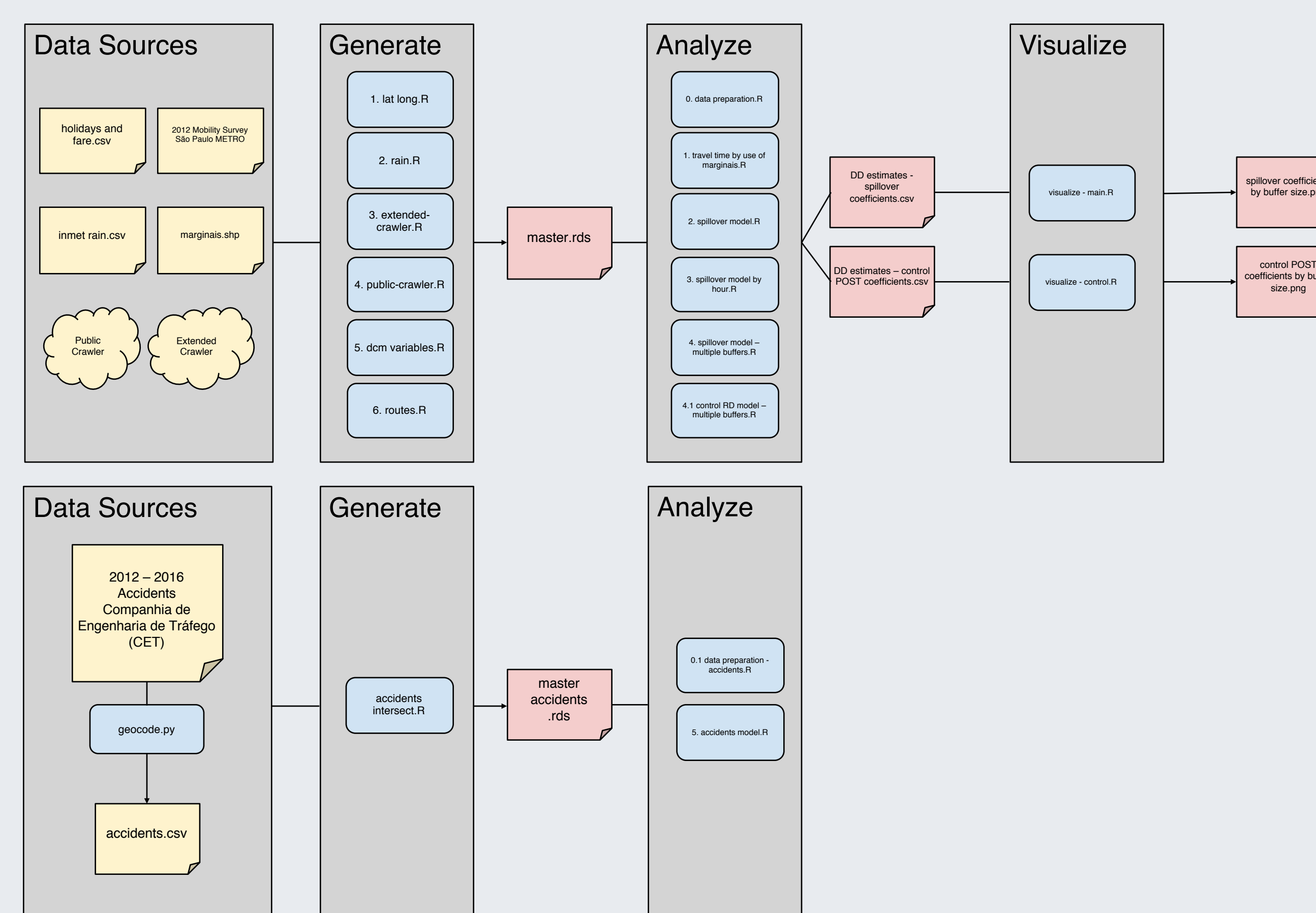
$$\ln TT_{it} = \alpha \cdot \text{rain} + \beta \cdot \text{date} + \gamma \cdot \text{holiday} + \theta \cdot \text{weekday} + \epsilon_{it}$$

- Using data from household survey, create a set of trips representative of total trips taken in São Paulo.
- Use Google Directions API to collect data on trips taken
 - Counterfactual trips taken using different modes of transportation (public vs private)
 - Counterfactual trips taken at different times of the day (20 minute intervals)
- Compare trips taken on roads with speed change with trips taken on roads without speed change

Data

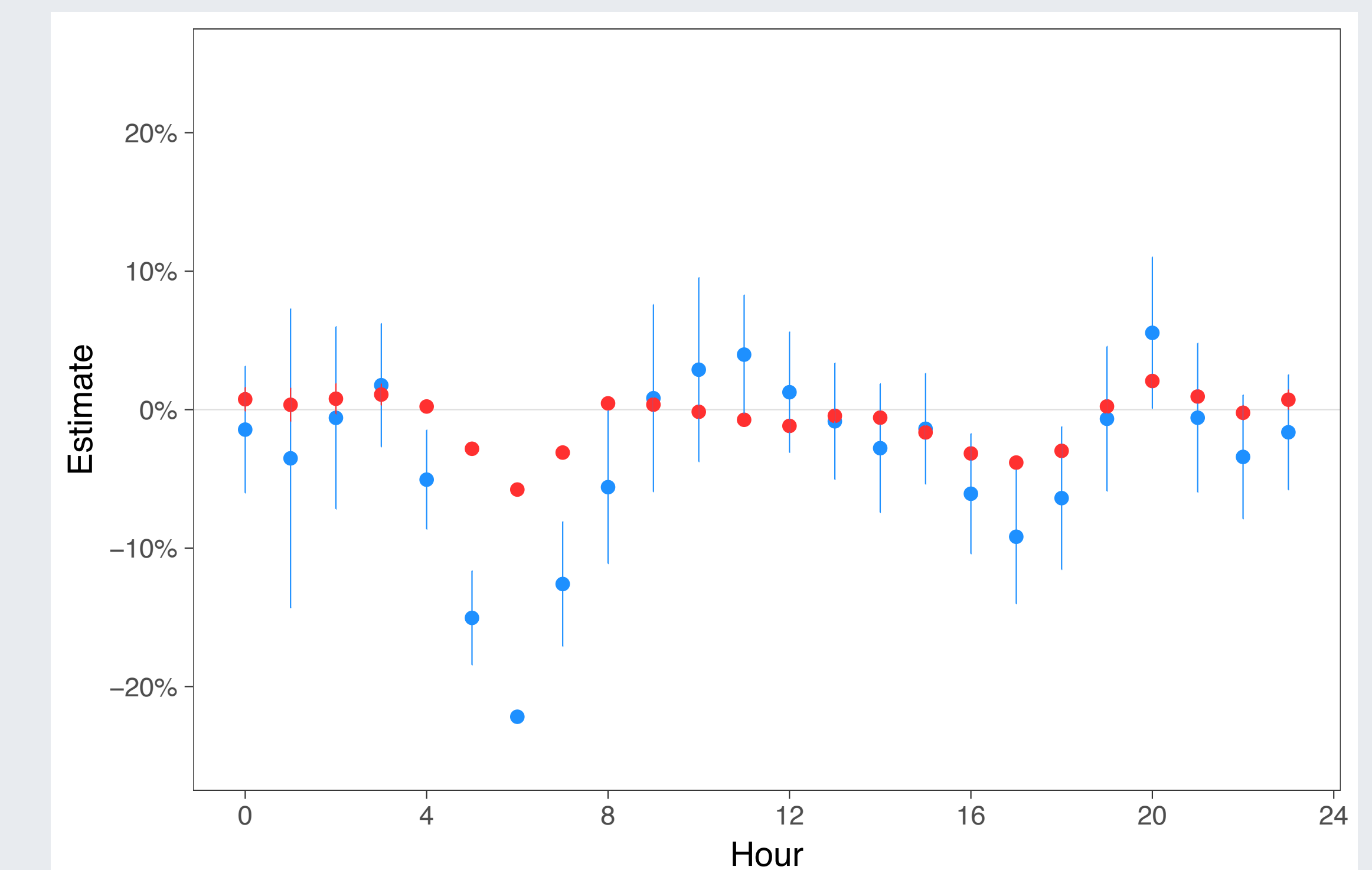
- 2012 Mobility Survey (São Paulo METRO)
- Real-time Traffic Data (Google)
- Geocoded traffic accidents (CET)

Our Infrastructure

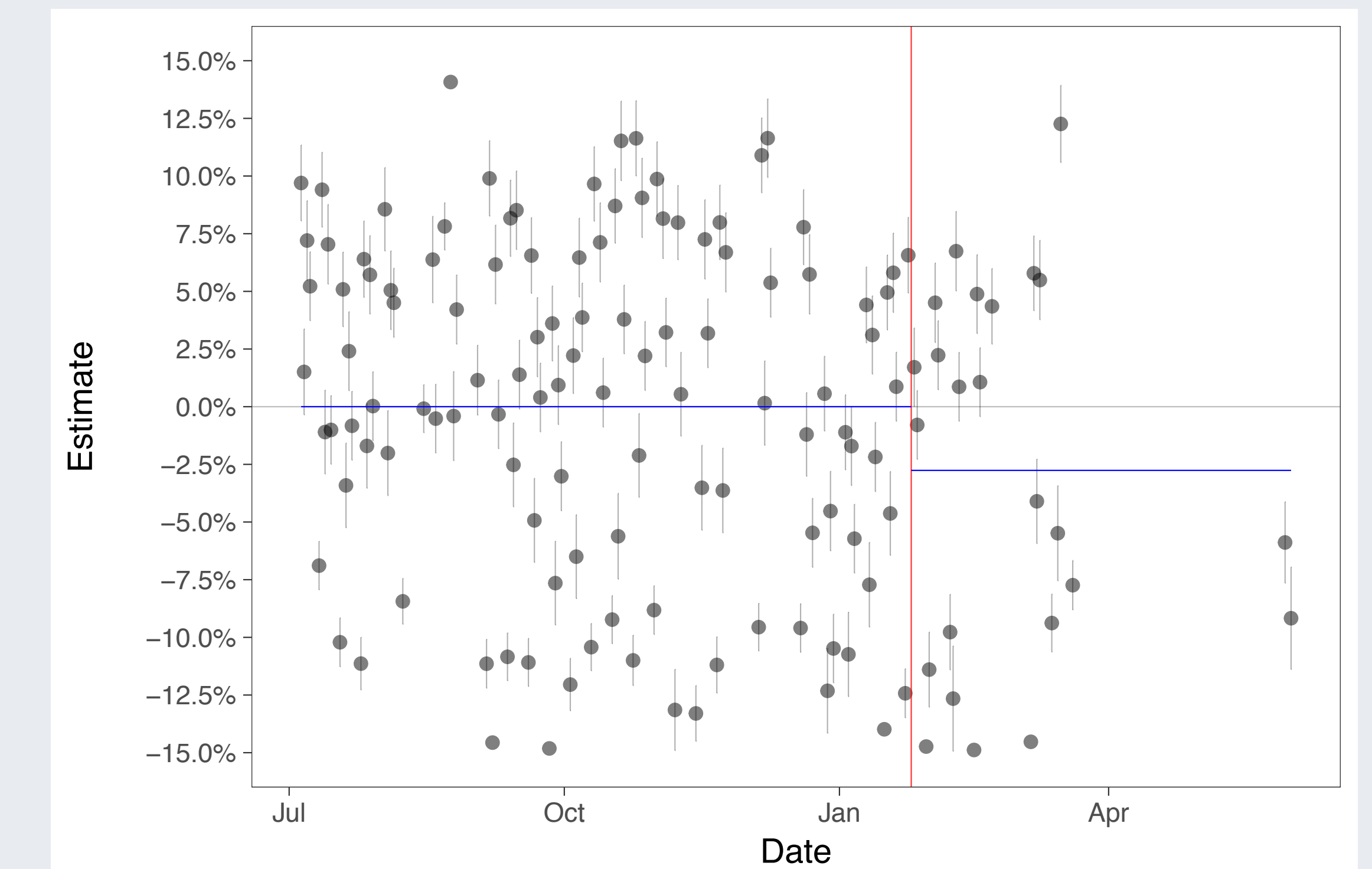


Results

Average Change In Travel Time
By Time Of Day



Average Change In Travel Time
On Roads With Speed Limit Change



Preliminary Findings

Travel time reduced by 1.1 % on all roads, travel time reduction of 2.2 % on roads with speed limit change

Largest effect seen during peak hours

Estimated economic benefits of \$400,000 USD per day