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 Bentham, 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

<table>
<thead>
<tr>
<th>Mode</th>
<th>Distance (km)</th>
<th>Duration (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Total (Millions)</td>
</tr>
<tr>
<td>Public</td>
<td>14.17</td>
<td>153.6</td>
</tr>
<tr>
<td>Private</td>
<td>10.32</td>
<td>81.8</td>
</tr>
<tr>
<td>Walking</td>
<td>1.22</td>
<td>8.3</td>
</tr>
</tbody>
</table>

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)

Results

![Average Change In Travel Time By Time Of Day](image)

![Average Change In Travel Time On Roads With Speed Limit Change](image)

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