Big Data Pilot Project: Replica
Data for Transportation Planning

A Full Travel Day Example

3. What is the most common type of purpose of your travel?
   - Family Vacation
   - Adventure
   - Business
   - Spiritual
   - Religious

4. What mode of transportation do you opt? Rate them on the basis of your preference (most preferred at the top, least preferred at the bottom):
   - Car, Bus, Train, Airplane, Ship

5. Where do you go most often?
   - Hill Stations
   - Beaches
   - Deserts
   - Historically Significant places
   - Commercially Busy cities

6. Have you traveled Internationally?
   - Yes
   - No

7. With whom, do you travel most often?
   - Family
   - Friends
   - Colleagues
   - Alone

8. Where do you like to stay?
   - Expensive Hotels
   - Economy Hotels
   - Resorts

9. What is generally the length of the trip?
   - 1-2 days
## Household Travel Survey vs. Big Data

<table>
<thead>
<tr>
<th></th>
<th>Household Travel Survey</th>
<th>Big Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Size</td>
<td>Small (&lt;0.5%)</td>
<td>Large (&gt;5%)</td>
</tr>
<tr>
<td>Total Cost</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Unit Cost</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Timeliness</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Privacy Concerns</td>
<td>High</td>
<td>Low to Medium</td>
</tr>
<tr>
<td>Data Quality</td>
<td>High</td>
<td>Medium to High</td>
</tr>
<tr>
<td>Seasonal Variation</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Project Status

• Project partners: SACOG, Caltrans, CARB
• Data coverage: quarterly travel snapshot from Sept. 2018 – Nov. 2020
• Current available data: Sept. 2018 – Aug. 2020
• Authorized online users: the project partners and SACOG member agencies
• Data request: general public (including consultants)
• Contact: Shengyi Gao, 916.340.6239, sgao@sacog.org
Replica Big Data Methodology

• Raw data: smart phone app based locations; cellular data; commercial marketing data

• Sample size: 5 to 30 percent samples for each census block
What Are in Replica Online Platform?

Replica gives you a complete picture of movement patterns in your region.

There are three ways to access the data...

**Replica Reports**
Create simple reports about key topics in just a few clicks

**Explorer**
Filter and visualize Replica data across dozens of vital metrics

**Data Downloads**
Download data in a variety of formats for analysis in other tools
Replica Report Screen Shots

- Where did people live?
- Why did people travel?
- Which mode did people use?
Replica Applications

• Provide the latest travel snapshot for the customized geographies of SACOG region
• Fill data gaps where there are no observed data
• Analyze commute patterns between SACOG and adjacent areas
• Analyze pass-through traffic
• Analyze freight movement
• Analyze seasonal variations of traffic flows
• Analyze SB 743 projects
• Analyze the impacts of road projects
Replica Travel Shed

Travel shed: areas that trips start and pass through the selected road segment(s)

- Who are using the road segment(s) (age, income, race/ethnicity)?
- Where are they from? (trip origin)
- Where do they go? (trip destination)
- Why do they travel? (trip destination purpose)
- How do they travel? (travel mode)
- When do they travel? (trip departure time)
- How far do they travel? (travel distance)