Data tools for Walking, Biking and Safe Routes to School Decision Making

Safe Routes to School National Partnership

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Transportation Behavior Today is Changing Rapidly

To keep up with fast-changing travel behavior, we need data that:

1. Describes Current Behavior
2. Measures Change Over Time
3. Is Diagnostic & Predictive
Big Data Can Help us Understand Travel Behavior more quickly and comprehensively
What Big Data are we working with?

Mobile device data from ~23% of US and Canadian adults and ~12% of commercial truck trips.

Video shows a subset from Oct 8th, 2017 in San Bernardino, California.
StreetLight InSight turns Big Data into actionable transportation analytics on demand.
Our Goal:

Be as accurate as a temporary count or survey – but available everywhere, affordably, in a few minutes, with frequent updates
Location data from mobile devices can show when, where, and how people move

Key Behaviors:

1. Accurate
2. Precise
3. Comprehensive
4. Anonymous

Note: This image shows a filtered subset of data to improve visibility. The data is from Sept 2016 in Fremont, CA.
How modes are determined

**Training a Random Forest Classifier**

**Training Data Sources**

- Caltrans Travel Survey (NREL)
- Atlanta Regional Travel Survey (NREL)
- Mid-Region Travel Survey – Albuquerque (NREL)
- Southern Nevada Household Travel Survey (NREL)
- Capital Bikeshare
StreetLight’s nationwide sample (for May 2017) is 86 times larger than NHTS!

StreetLight’s average trip distance are shorter than surveys, especially NHTS

<table>
<thead>
<tr>
<th>Mode</th>
<th>NHTS (miles)</th>
<th>SL – Nat’l (miles)</th>
<th>CHTS (miles)</th>
<th>SL – CA (miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bicycle (all)</td>
<td>2.38</td>
<td>1.51</td>
<td>1.50</td>
<td>1.32</td>
</tr>
<tr>
<td>Bicycle (&gt;300m)</td>
<td>1.57</td>
<td>1.37</td>
<td></td>
<td></td>
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</tbody>
</table>
Validation – Compare to Permanent Counters (SFMTA)

Sample penetrations highly clustered between 1 and 5% with average 6.4%

Histogram of StreetLight Sample Penetration (All Day Types)
Origin of Bike Trips going to Jack London Square (average weekday-all day period)
Activity near schools

- 23% of the adult population
- Do not have data on children for privacy
- Can’t look at specific school locations
Crossing locations

115 people walking

72 people walking
How data can help inform decisions

Vista, CA

School
Collision Data Helps Prioritize Safety Improvements
Density of Pedestrian Trips in the City of Santa Ana

High Pedestrian Activity and Collisions