Agenda

I. Our Data Resources/Metrics
II. Inside The StreetLight InSight® Platform
Who We Are
We Offer The Best Big Data and Analytics Platform Together

The StreetLight InSight® Platform
StreetLight InSight Adds Value to High Priority Transportation Planning and Modeling Initiatives

**Travel Demand Modeling**
- Calibrate with Empirical, Comprehensive O-D Matrices
- Colorado DOT used StreetLight InSight to Understand Seasonal & Weekday/Weekend Trends
- Summer 2016
- Winter 2016

**Long-Term Planning**
- Study Regional Patterns & Engage With the Public
- Fehr & Peers and Napa Valley Transport Authority used StreetLight InSight to Study Regional Trends

**Travel Demand Management**
- Scan for High-Potential Project Opportunities
- Virginia DOT, Michael Baker, and SSTI Scanned for “Displaceable Vehicle Trips” with StreetLight InSight

**Performance Measurement**
- Evaluate AADT, Travel Time Reliability, & More
- Siemens used StreetLight InSight to Study the Impact of its ITS Traffic Signals on Travel Time Reliability

**Congestion Studies**
- Identify the Cause of Congestion
- The City of Lafayette, CA, and Arup used StreetLight InSight to Analyze Downtown Congestion

**Project Evaluations**
- Easily Conduct “Before & After” Studies
- Fehr & Peers and SANDAG used StreetLight InSight to Determine the Impact of a Toll on Behavior

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STREETLIGHTDATA
More Than Data Collection Alone: StreetLight InSight Helps You Transform Your Planning Practice

1. Replace and Enhance
   - Larger sample
   - Save time and money

2. Go Beyond!
   - Measure behavior as it changes
   - Unlimited data to optimize investments
   - Empirically assess performance
   - Enhance public engagement
Location Data from Mobile Devices Can Show When, Where, and How People Move

**Key Benefits**

- Accurate
- Precise
- Comprehensive
- Anonymous

Note: This image shows a filtered subset of data to improve visibility. The data is from September 2016 in Fremont, CA.
Multi-Sourced Anonymous Information Offers Precision and Contextual Richness
Our Big Data Resources Deliver a Large Sample – Plus Spatial and Temporal Precision

<table>
<thead>
<tr>
<th>Key Characteristics of Our Locational Big Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Multiple Types of Data</strong></td>
</tr>
<tr>
<td>• Location-Based Services records</td>
</tr>
<tr>
<td>• Navigation-GPS records</td>
</tr>
<tr>
<td><strong>Sample Size</strong></td>
</tr>
<tr>
<td>• Covers ~23% of adult population in US and Canada</td>
</tr>
<tr>
<td>• Unbiased sample backed up with automated normalization</td>
</tr>
<tr>
<td><strong>Spatial Precision and Coverage</strong></td>
</tr>
<tr>
<td>• As precise as 5-25 meters, average better than 18 meters</td>
</tr>
<tr>
<td>• 4-carrier coverage – no rural gaps</td>
</tr>
<tr>
<td><strong>Temporal Precision</strong></td>
</tr>
<tr>
<td>• One-hour intervals</td>
</tr>
<tr>
<td>• Weekends vs. weekdays</td>
</tr>
<tr>
<td><strong>Archival Data</strong></td>
</tr>
<tr>
<td>• Monthly data periods from 2014 through “month before last”</td>
</tr>
<tr>
<td><strong>Privacy Protection</strong></td>
</tr>
<tr>
<td>• All data is de-identified by our suppliers</td>
</tr>
<tr>
<td>• No personally identifying information</td>
</tr>
<tr>
<td>• Metrics are aggregated into groups</td>
</tr>
</tbody>
</table>

This image shows a location record’s potential location at different levels of spatial precision. At 300m to 1000m spatial precision, records cannot provide corridor- or intersection-level insights.
Sample Size for Southeast Florida

Device Share of Residents for Tracts in Southeast Florida

Average Device Share by Tract across Income Groups

Average Device Share: 23%
# StreetLight Data for Modelers

<table>
<thead>
<tr>
<th>Trip Based Model</th>
<th>Activity Based Model</th>
<th>StreetLight Insight® Project</th>
<th>StreetLight Insight® Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trip Generation</td>
<td>Activity Generation and Scheduling</td>
<td>Zone Activity Analysis</td>
<td>Zone activity by purpose</td>
</tr>
<tr>
<td>Trip Distribution</td>
<td>Tour and Trip Destination Choice</td>
<td>O-D, O-D-G</td>
<td>O-D</td>
</tr>
<tr>
<td>Trip Mode Choice</td>
<td>Tour and Trip Mode Choice</td>
<td>Trips by Mode</td>
<td>O-D by mode</td>
</tr>
<tr>
<td>Trip Time of Day</td>
<td>Tour and Trip Time of Day</td>
<td>O-D, O-D-G</td>
<td>0-D by day parts</td>
</tr>
<tr>
<td>Trip Assignment</td>
<td>Trip Assignment</td>
<td>Zone Activity (ZA) Analysis AADT Estimate</td>
<td>Combination of ZA and AADT Estimate to estimate link volumes by day parts</td>
</tr>
</tbody>
</table>

XXX: In development
# StreetLight Data for Modelers

<table>
<thead>
<tr>
<th>Modelers Want...</th>
<th>StreetLight Insight® Project</th>
<th>StreetLight Insight® Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone-to-zone person trips</td>
<td>O-D Analysis using LBS</td>
<td>O-D</td>
</tr>
<tr>
<td>Zone-to-zone vehicle trips</td>
<td>O-D Analysis using GPS</td>
<td>Personal/Commercial O-D</td>
</tr>
<tr>
<td>Trip length/duration distribution</td>
<td>O-D Analysis/Traffic Diagnostics</td>
<td>Premium trip attributes</td>
</tr>
<tr>
<td>Trips by income and purpose</td>
<td>O-D Analysis/Traffic Diagnostics</td>
<td>Premium traveler attributes</td>
</tr>
<tr>
<td>Time of Day</td>
<td>O-D Analysis/Traffic Diagnostics</td>
<td>Basic trip attributes</td>
</tr>
<tr>
<td>Dwell times between trips on a tour</td>
<td>Tours Analysis (custom)</td>
<td>Dwell time between trips</td>
</tr>
<tr>
<td>Trips using a link(s)</td>
<td>O-D M-F</td>
<td>O-D</td>
</tr>
<tr>
<td>Intersection delays</td>
<td>Segment Analysis</td>
<td>Travel Time</td>
</tr>
<tr>
<td>Travel time on a link</td>
<td>Segment Analysis</td>
<td>Travel Time</td>
</tr>
</tbody>
</table>
Modeling and Survey Applications

VDOT Statewide Travel Model

- 6,000+ TAZ OD Matrix
- Income, trip purpose
- Select links and key OD trip pairs
- Short trips, circuity, low-income
- Top-level excitement, sponsorship
- Stakeholder access, participation
- Data visualization and exploration

Southeast Florida Tri-County Travel Survey

- Personal & commercial
- O-D patterns and basic trip purpose
- Complement Other Survey Data
  - Hard to reach populations
  - Sample size/scale/cost
  - Frequency of updates, trends
  - Origin, destination, route
  - Performance Management
How To Use StreetLight Insight®
Setting Up A StreetLight InSight Analysis Always Requires Three Basic Steps

1. **Input Your Zones**
   Gates, Segments, or Areas

2. **Set Up & Specify Project Options**
Setting Up A StreetLight InSight Analysis Always Requires Three Basic Steps

3. Visualize and/or Download Project Output

StreetLight InSight Visualizations

Full CSV Metric Download
We Make it Easy to Understand the Sample Size of StreetLight InSight Projects

Total Sample Size Metrics CSVs
A CSV file that describes the estimated number of devices or trips included in the analysis comes with all Projects that use a single data source.

- Navigation-GPS Data
  Sample Size = Approximate Number of Trips in Project's Sample

- Location-Based Services
  Data Sample Size = Approximate Number of Devices in Project’s Sample
  Available with all Projects for no extra fee

Download Device Counts with Metrics
Device or trip counts are included in CSV file downloads in their own column next to Index values.
Use Cases

- Internal-External Trips
- Commercial Vehicle Tours
- Corridor Studies
- Traffic Diagnostics
Internal-External Trips

% Difference from Count

StreetLight Data
AirSage
Internal-External Trips

Commercial
External-to-
Internal Trips
Internal-External Trips

Personal External-to-Internal Trips
### Commercial Tours

#### Commercial Trip Metrics

<table>
<thead>
<tr>
<th>For Trips</th>
<th>Commercial Trip Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Touching 1 zone,</td>
<td>For Tours</td>
</tr>
<tr>
<td>• Going between an origin/destination</td>
<td>• Touching 1 zone</td>
</tr>
<tr>
<td>• Select link (origin/middle/destination)</td>
<td>• Going between a “final” O/D or “intermediary” O/D pairs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average Travel Time + Distribution of Travel Times</th>
<th>Average total tour time/distance and distribution of total tour times/distances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Trip Distance + Distribution of Trip Distances</td>
<td># of trips/stops per tour</td>
</tr>
<tr>
<td>Distribution of trip/stop duration per tour</td>
<td></td>
</tr>
</tbody>
</table>

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How We Turn GPS Data into Tours

We process the data algorithmically in two phases:
1. Conversion of Data Records to Trips
2. Conversion of Trips to Tours
### Custom TAZ-level Commercial Tours with Context

*Example: Heavy Duty Truck Leaving Port of Houston on Weekday Morning*

![Map of Houston area with routes marked]

<table>
<thead>
<tr>
<th>Tour ID</th>
<th>Stop Index</th>
<th>TAZ ID</th>
<th>Land Use</th>
<th>Arrive Time</th>
<th>Depart Time</th>
<th>Stop Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>0</td>
<td>2374</td>
<td>Manufacturing</td>
<td>na</td>
<td>9am</td>
<td>na</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>7771</td>
<td>Warehouse</td>
<td>11am</td>
<td>11:30am</td>
<td>19</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>5468</td>
<td>Retail</td>
<td>12:30pm</td>
<td>1pm</td>
<td>20</td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>8939</td>
<td>Retail</td>
<td>2pm</td>
<td>2pm</td>
<td>15</td>
</tr>
<tr>
<td>11</td>
<td>4</td>
<td>7771</td>
<td>Warehouse</td>
<td>3pm</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>44</td>
<td>0</td>
<td>7771</td>
<td>Warehouse</td>
<td>na</td>
<td>4pm</td>
<td>na</td>
</tr>
<tr>
<td>44</td>
<td>1</td>
<td>5468</td>
<td>Retail</td>
<td>5pm</td>
<td>5:30pm</td>
<td>20</td>
</tr>
<tr>
<td>44</td>
<td>2</td>
<td>5375</td>
<td>Retail</td>
<td>6pm</td>
<td>6:30pm</td>
<td>25</td>
</tr>
<tr>
<td>44</td>
<td>3</td>
<td>7771</td>
<td>Warehouse</td>
<td>8pm</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>75</td>
<td>0</td>
<td>5555</td>
<td>Agricultural</td>
<td>na</td>
<td>5am</td>
<td>na</td>
</tr>
<tr>
<td>75</td>
<td>1</td>
<td>3234</td>
<td>Warehouse</td>
<td>11am</td>
<td>4pm</td>
<td>235</td>
</tr>
<tr>
<td>75</td>
<td>2</td>
<td>1202</td>
<td>Warehouse</td>
<td>5pm</td>
<td>7pm</td>
<td>105</td>
</tr>
<tr>
<td>75</td>
<td>3</td>
<td>2039</td>
<td>Warehouse</td>
<td>9pm</td>
<td>na</td>
<td>na</td>
</tr>
</tbody>
</table>
Commercial Tour-based Freight Modeling & Planning

**EX:** Heavy-Duty Truck Tour Routes from Port of LA/LB
Trip and Tour Metrics Reveal Differences
Half of HD and nearly 60% of MD trucks go somewhere else within the port boundaries for their first trip
Corridor Studies: SH 71 in Austin
Corridor Studies: SH 71 in Austin

O-D to Pre-Set Geography

Majority of trips on SH 71 are Barstop locals

SH 71 is highly utilized for east/west trips between Austin and Houston

55% of trips ending in Bastrop are locals and 13% are coming from nearby block groups along SH 71 west of Bastrop.
Corridor Studies: SH 71 in Austin

O-D Analysis

Only 14% of trips on SH 71 going eastbound to Bastrop are coming from SH 71 west of SH 130.

The majority, 45%, are coming from highways 21 and 304.

46.3% of trips on SH 71 west of SH 130 end up going northbound.
Corridor Studies: SH 71 in Austin

Segment Analysis

SH-71 segments near the river crossing to Bastrop are the most congested during rush 4-6pm hour
Corridor Studies: SH 71 in Austin

Traffic Diagnostics

High transit score

47% of vehicle trips on SH71 can potentially be taken off the highway with better transit between Austin and Bastrop.
Corridor Studies: Austin Roads

Traffic Diagnostics

Roads with:
- Low to medium traffic (AADT < 30K)
- Highly congested (Congestion level > 25%)
- High amount of vehicle trips traveling < 5 miles

Great target for bike improvements!
Thank You!

Questions/Comments?