Analyzing Travel Patterns with Big Data

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Location Data from Mobile Devices Can Show When, Where, and How People Move

Video shows a subset of Oct 8, 2017 in San Bernardino
StreetLight InSight Turns Big Data into Actionable Transportation Analytics On Demand

Metrics:
- AADT
- Origin-Destination
- Select Link
- Commercial Trips & More

Massive Mobile Data + Contextual Data

StreetLight InSight®
Arc of Putting Big Data to Work

- Unlimited Data to Optimize Investments
- Empirically Assess Performance
- Enhance Public Engagement
- Go Beyond!
- Go Bigger!
- Replace & Enhance
- Save Time & Money
- Large Sample
- Measure Behavior as it Changes

Save Time & Money

Large Sample

Replace & Enhance

Measure Behavior as it Changes

Unlimited Data to Optimize Investments

Empirically Assess Performance

Enhance Public Engagement

Go Beyond!

Go Bigger!

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Signal Studies

Travel Demand Modeling

Toll Planning

Equity + Investment Priorities

Reduce Costs / Increase Benefits

Measure Behavior as it Changes

Equitable EV Charging Investment Plan

Data-Driven Active Mode Investment Triage

Assess Impact

Signal Studies

Travel Demand Modeling

Toll Planning

Equity + Investment Priorities

Save Time & Money

Large Sample

Replace & Enhance

Measure Behavior as it Changes

Unlimited Data to Optimize Investments

Empirically Assess Performance

Enhance Public Engagement

Go Beyond!

Go Bigger!

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Today, we’ll discuss two examples in CA

1. Replace and Enhance
   Project Performance Measurement in Fremont, CA

2. Go Beyond!
   Travel Demand Management in San Diego, CA
Congestion is a Serious Problem in Fremont, California

Fremont traffic is an outcome of the imbalance between housing and jobs. **Annual Growth in Silicon Valley**

- **50,000** New Jobs vs. **5,000** New Homes

Fremont is at the crossroads of major commute corridors. Fremont’s geographic location is literally a “funnel for traffic” from jobs to homes in the Tri-Valley, Contra Costa County, Central Valley, and beyond.

**FREMONT FUNNEL EFFECT: EVENING COMMUTE**

- Peninsula
- Niles Canyon
- South Bay
- 84
- Contra Costa County
- Tri-Valley
- Sunol Grade
- Central Valley

**REGIONAL EFFORTS**
- BART Extension to San Jose (2018)
- New Express Lanes on I-680 (2019)
- Additional ACE Trains:* 4 to 6 Trains (2020) 6 to 10 Trains (2025)

*Subject to project approval

**LOCAL CITY EFFORTS**
- City Council Mobility Task Force Established to Improve Congestion and Encourage Mobility
- Ramp Metering and Turn Restrictions
- New Technology for Traffic Signals
- Partnership with Waze

Infographic and photo shown here are property of the city of Fremont, CA.
Did New Ramp Meters and Turn Restrictions Reduce Cut-Through Trips in Fremont, CA?

**Need:** The City of Fremont needed to build buy-in for congestion mitigation tactics from city hall and residents

**Question:** Did the new restrictions and ramp meters reduce cut-through commuter trips through neighborhoods?

**Challenge:** Lack of empirical data sources that demonstrated performance

**Solution:** The City of Fremont used StreetLight InSight to measure cut through trip volumes before and after the tactics implementation. Results showed a 33% reduction overall (weighted average).

<table>
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<th>Calle Amigo to EB Niles Canyon Rd</th>
<th>Viento Dr to EB Niles Canyon Rd</th>
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The City of Fremont Ran a Series of Big Data Analytics to Measure Project Performance

About the Analyses

Analytics Derived:
- Origin-Destination Analysis
- Origin-Destination with Middle Filter
- Zone Activity
- AADT
- Visitor Home-Work Analysis
- Trip duration, speed, circuity

Locations Studied:
- Highways
- Ramps
- Neighborhood roads
- Intersections

Data Ranges:
- Before-and-after (varied by study and turn restriction)
- Seasonal (spring v. summer, monthly – helped for studying impact of major employers like Stanford)

Outputs

- Real-world evidence of congestion mitigation and reduction in cut-through trips
- Series of handouts and public communications

140 studies in total

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Go Beyond:
San Diego, California
Big Data Presents New Opportunities to Planners – No Matter What Approach is Used

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   - Project Performance Measurement in Fremont, CA

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Questions?

Thank You!
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