Cutting Back Cut-through Trips in Fremont, California: Measuring the Impact of Signal Time Changes

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Agenda

I. The Challenge: Congestion in Fremont
II. Taking Action to Stop Cut-Through Trips
III. The Solution: Performance Analysis
IV. Q&A
The Challenge:
Congestion in Fremont
Congestion is a Serious Problem in Fremont, California

Can you guess if this is a street parking or if this is a traffic jam?
Local Traffic Engineers Blamed the Job-Housing Imbalance in the San Francisco Bay Area

**Joe to Housing Ratio**
(Source: U.S. Census Bureau, 2016 Estimates)

- Santa Clara County: 1.58
- San Mateo County: 1.37
- Alameda County: 0.97
- Contra Costa County: 0.77
- San Joaquin County: 0.72

City of Palo Alto = 3.13
City of Santa Clara = 2.08

Graph provided by City of Fremont
Taking Action to Stop Cut-Through Trips
The City of Fremont Implemented New Traffic Policies: Ramp Metering, Turn Restrictions, and a Waze Partnership

- **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.

**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 by the city of Fremont, CA.*
However, Highway Metering and Turn Restrictions Inconvenienced Some Residents

“Overall, since we partnered with Caltrans to add ramp metering to 680 a month ago, I believe the travel time savings of the “Fremont cut-through” have been eliminated, but we are finding that the navigation apps are slow to change, as are people’s old habits...”I appreciate you stating that it’s far too soon to label the ramp metering a disaster. One perspective to be aware of is that since the ramp meters became operational last month there have been several incidents that have gridlocked the transportation system in the Fremont area. Niles Canyon Road was closed twice during commute periods, forcing traffic to detour to 680 and through Fremont interchanges. There was a peak period traffic crash on 680 another day. And we had “carmageddon” on Friday the 13th — the day before the three-day MLK weekend when traffic congestion on 680 started before noon due to a swarm of folks headed to Tahoe to enjoy epic ski conditions. Many folks have been inaccurately associating the traffic congestion from these “special conditions” to the new ramp meters.

Hans-the-Traffic-Czar
(Hans Larsen, Public Works Director, City of Fremont)
The Solution: An *Empirical* Performance Analysis

Proving to Stakeholders that Congestion Was Accurately Diagnosed and Mitigation Tactics Were Effective
The City Turned to Big Data for Performance Measurement

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
They Used StreetLight Data’s On-Demand Platform to Run Transportation Analytics

Massive Mobile Data + Contextual Data ➔ Processing Software ➔

- Corridor Studies
- Congestion Analyses
- Air Quality/ GHG Estimation
- Corridor Studies
- AADT
- Freight Modeling
- Internal/External Studies
- Public Engagement
- Accessibility Studies
- Travel Demand Models
- Equity Assessments
140 Studies Were Completed in Total

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
- Confirmation of the cause of congestion
- Real-world evidence of congestion mitigation and reduction in cut-through trips
- Series of handouts and public communications
First, The City Validated the Assumption that Congestion Was Caused By Cut-Through Trips by Commuters

~40% of trips end in the surrounding yellow and orange ZIPS
Next, Traffic Engineers Analyzed The Turn Restrictions to Determine Their Impact on Cut-Through Trips

Graphics by the city of Fremont, CA.
The City Also Validated the Impact of Ramp Metering on Cut-Through Trips

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Graphics by the city of Fremont, CA.
Results Were Also Shared with Residents in A Detailed Public Newsletter
The City’s Public Work Department Now Has More Support and Better Data to Prioritize Future Projects

Upcoming Projects:

• I-680 Regional Express Lane
• BART Extension
• ACE Trains
• New traffic signal systems
• Optimizing traffic signal timing
Pros and Cons of Using Big Data

- Empirical Analytics
- Go “Back In Time”
- No Counts
- Public Support
- Measure Complete Trips
- Learning Curve
Q&A

Thank you!

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