Freeway Traffic Impact Study of Expo Light Rail

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Introduction

• **The Expo Light Rail** connecting downtown Los Angeles and Santa Monica is a significant and long-term public investment in transit, city-wide and regional mobility.

• Ridership increased steadily from 10,000 daily to 20,000 daily since the grand opening of Expo Light Rail Phase I (connecting Culver City and downtown LA) on April 28th, 2012.

• The Expo Light rail is targeted at and expected to reduce the traffic on west-east freeways, arterial streets, and other freeways with connectivity.

Motivation

• **Real-time and historical traffic sensor data**
  + Traffic sensors covering the entire network of Los Angeles County highways and arterial streets of Los Angeles City.
  + High temporal resolution: one reading per minute.
  + Spatial Resolution: approximately 0.5 miles on freeway.
  + Includes speed and volume data (# of cars per 30 secs).

• **Most likely impacted freeways and arterials**
  + I-10 between culver city and I-110.
  + Arterial streets in parallel to Expo Light Rail.
  + Relieve traffic during events like USC football.

Methodology

• **Eliminate traffic fluctuation factor**
  + Continuous factors: gas price, employment rate etc.
  + Monthly, seasonal and yearly fluctuation factors.

• **Benchmarking**
  + Use a corridor with similar traffic pattern as benchmark.
  + Example: evaluate impact of traffic volume on I-10 using I-110 as the benchmark.

Evaluation

• **Benchmark Corridors:**
  + I-110 between I-10 and I-105.
  + I-110 between I-101 and Pasadena.
  + I-405 between Sunset Blvd. and I-105.

• **Inbound direction volume/speed impact on I-10: AM peak hour**

• **Inbound direction volume/speed impact on I-10: PM peak hour**

• **Outbound direction volume/speed impact on I-10: AM peak hour**

• **Outbound direction volume/speed impact on I-10: PM peak hour**

Conclusion

• A significant initial impact on I-10 after the opening of Expo Light Rail.
• Impact gradually converges to a new equilibrium.
• The result is most consistent when using I-405 as the benchmark.
• With I-405 as the benchmark:
  + The inbound direction on I-10 during AM peak has a lower volume and higher speed after the Expo Light Rail.
  + For all other three cases I-10 has a higher volume and higher speed after the Expo Light Rail, which is a great improvement from hyper-congestion.

Future Work

• Look for possibly better benchmark corridor.
• Evaluate the impact of Expo Light Rail on traffic during events, for instance, USC football game.