

# 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 28<sup>th</sup>, 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).

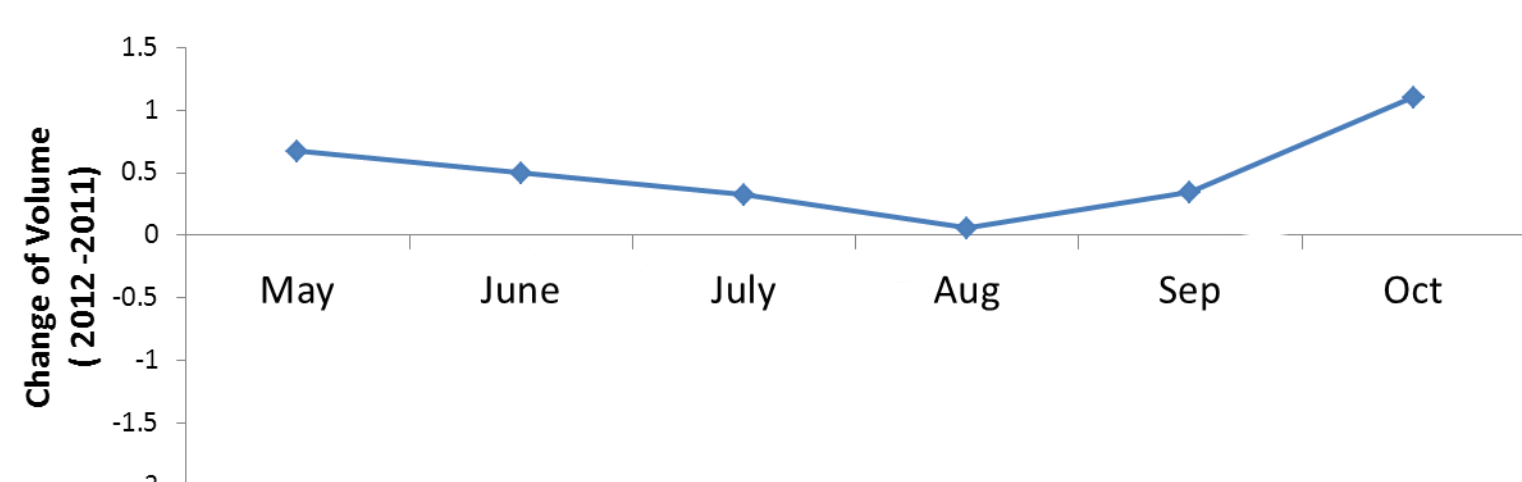


- Most likely impacted freeways and arterials
  - + I-10 between culver city and I-110.
  - + Arterial streets in parallel to Expo Light Rail.
  - + Relieve traffic during events like USC football.

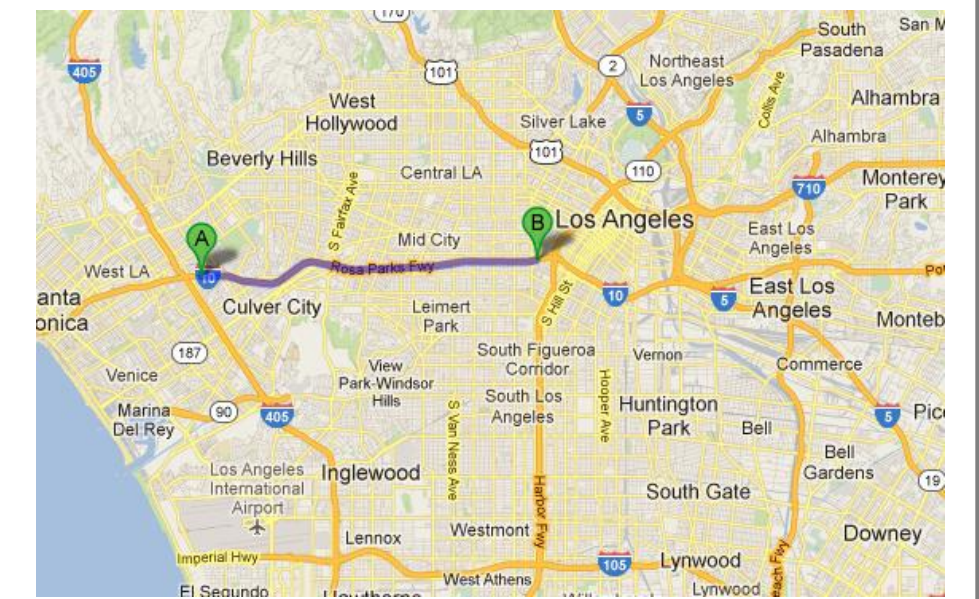
## Methodology

- 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.

	2011: Diff(I10-I110)	2012: Diff(I10-I110)	2012-2011
May	3.3296	4.0022	0.6726
June	3.3369	3.8353	0.4984
July	4.5258	4.8513	0.3255
Aug	4.5151	4.5708	0.0557
Sep	4.477	4.8192	0.3422
Oct	4.1151	5.2194	1.1043

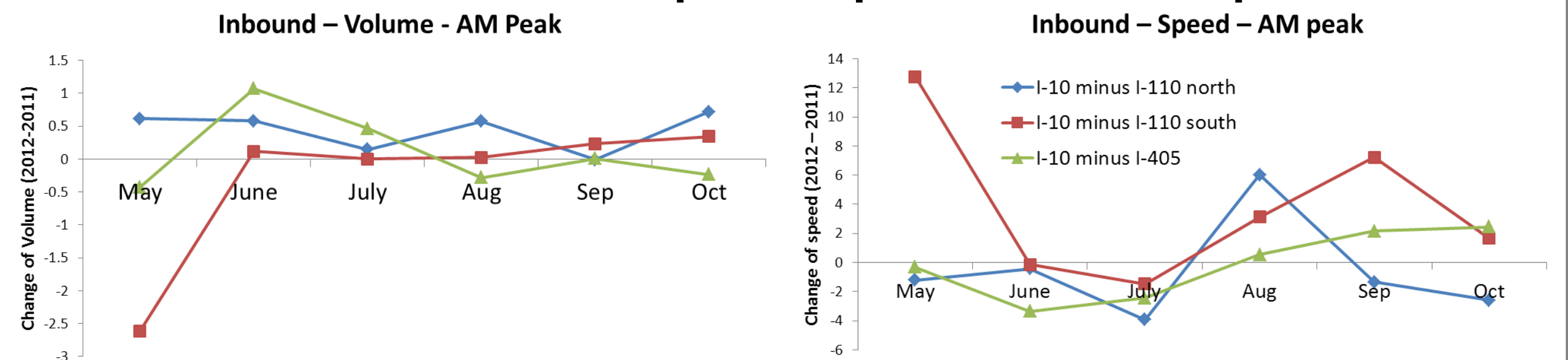


## Evaluation

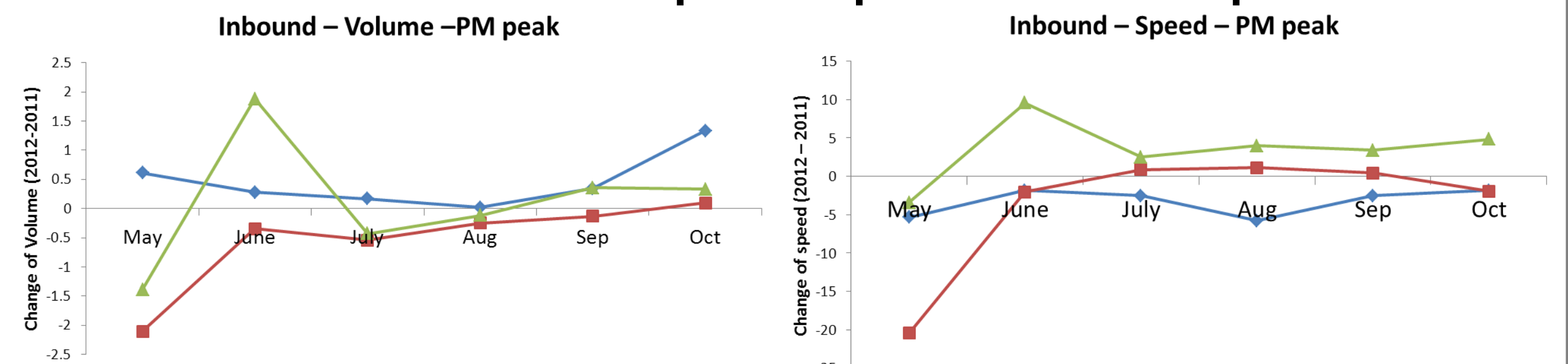


- Benchmark Corridors:
  - + I-110 between I-10 and I-105.
  - + I-110 between I-101 and Pasadena.
  - + I-405 between Sunset Blvd. and I-105.

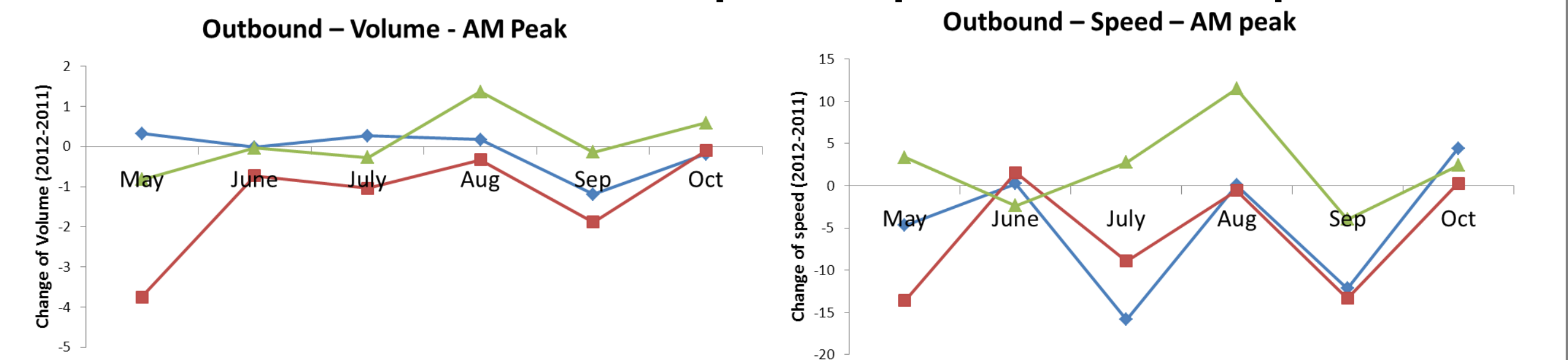
### Inbound direction volume/speed impact on I-10: AM peak hour



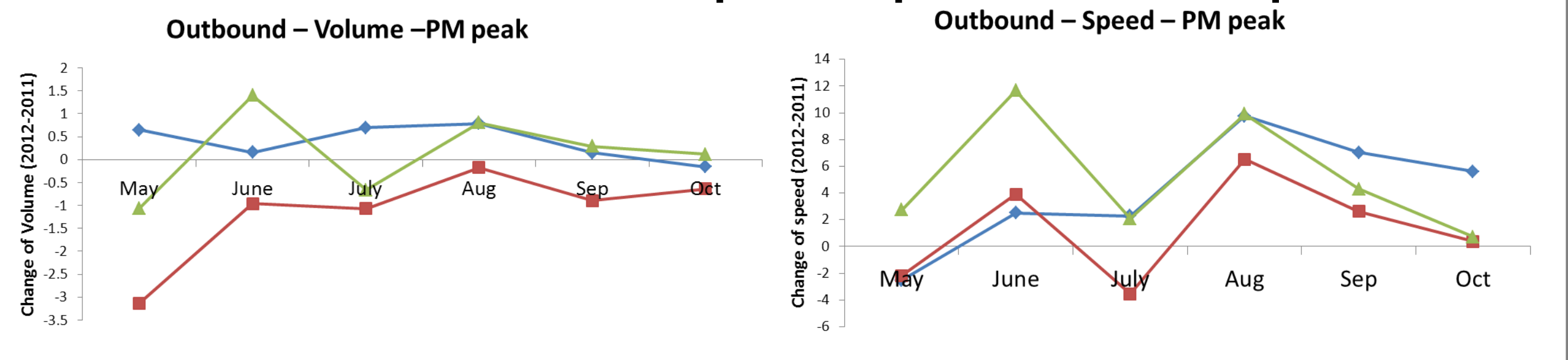
### Inbound direction volume/speed impact on I-10: PM peak hour



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

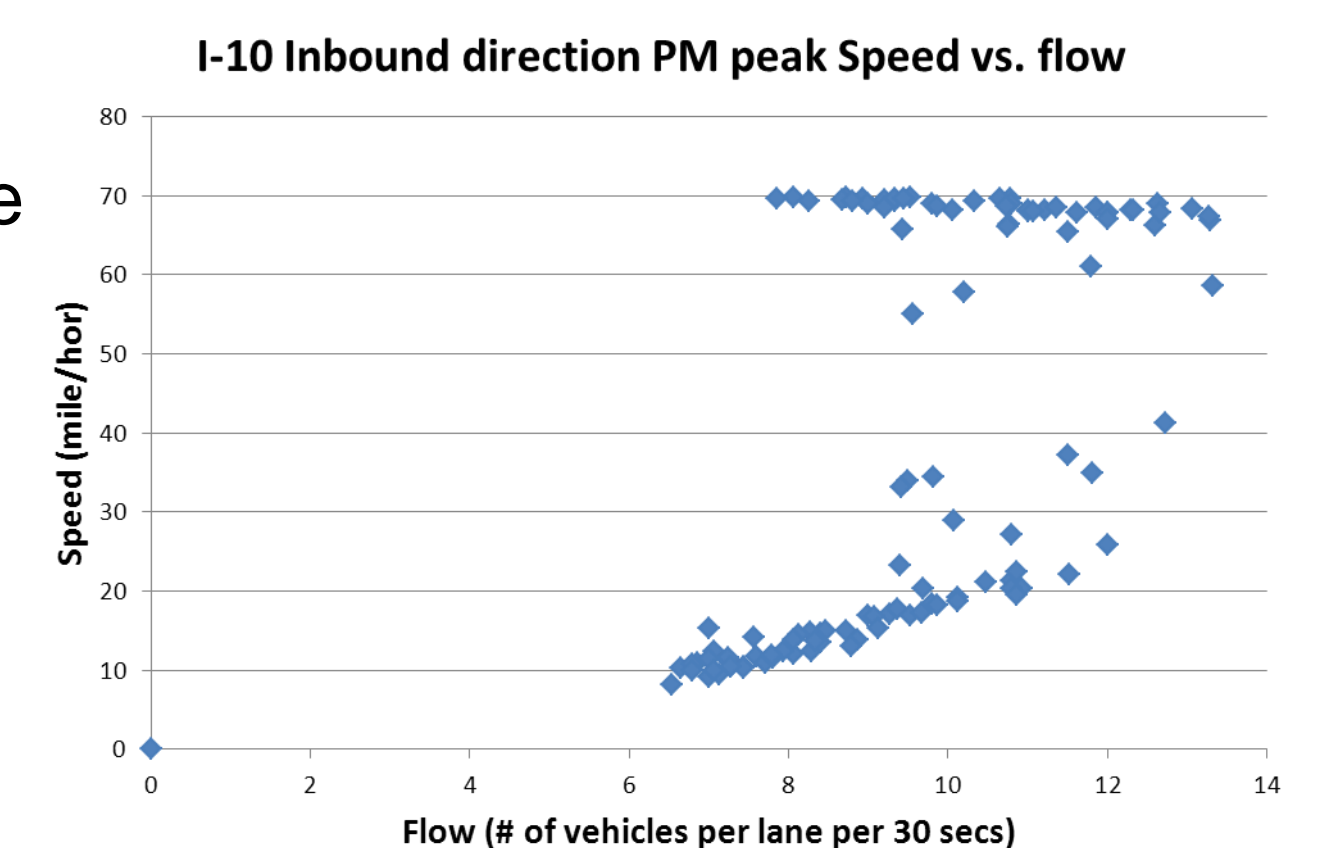


### Outbound direction volume/speed impact on I-10: PM peak hour



## 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.