

# TxDOT Innovations and Technology Deployment Briefs

## IH 10 Freeway Adaptive Traffic Signal Control



### PROBLEM

Normal, free flowing freeway conditions may be impacted by incidents, construction, as well as simply too many vehicles for the roadway to handle. When these situations occur, measures must be taken to adjust the traffic entering the freeway to minimize the increase in congestion.

### SOLUTION

One solution relies on moderating the amount of traffic entering the freeway from the frontage roads. By measuring freeway volume and communicating that information to the frontage road signals, timing plans can be created to help avoid further congesting the freeway by allowing frontage road traffic to flow more freely with more green time.

This project utilized existing fiber and radar sensors in the field. The sensors can monitor both directions of the freeway. When certain conditions are met on the freeway, the sensors can send that information to the frontage road traffic signal control cabinets. This activates the alternative signal timing plans for the frontage roads.

### BENEFITS

Freeway congestion can be improved by utilizing capacity available on frontage roads. This increased capacity can further maximize traffic throughput by increasing frontage road green-light time by an additional 10 percent, or based on cycle length, when the adjacent freeway is at 25 percent volume. This innovative approach increases the throughput of the existing freeway system, reduces delay for drivers, and saves fuel. Other uses for this technology include monitoring exit ramp conditions, and if there is backup, the sensor can trigger a low priority preemption or an alternative timing plan to clear the exit ramp traffic.

### KEY TASKS

- Adapt existing freeway sensors.
- Install additional equipment for responsive system.



PROJECT DELIVERY



CUSTOMER FOCUS



FOSTER STEWARDSHIP



PRESERVE ASSETS



OPTIMIZE PERFORMANCE



PROMOTE SAFETY



VALUE EMPLOYEES



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- Install antennas and Input/Output communication equipment at sensor locations and at intersections.
- Sensor setup for number of lanes and directions.
- Contact closure interval criteria setup for speed, volume, and/or occupancy.
- Program radio for contact closure inputs and outputs at sensor location and traffic signal cabinet.
- Connect the radio contact closure outputs at the intersection to the designated input terminals.

### DATA SOURCES

All the data collection is done by the high-definition sensor at 30 second intervals.



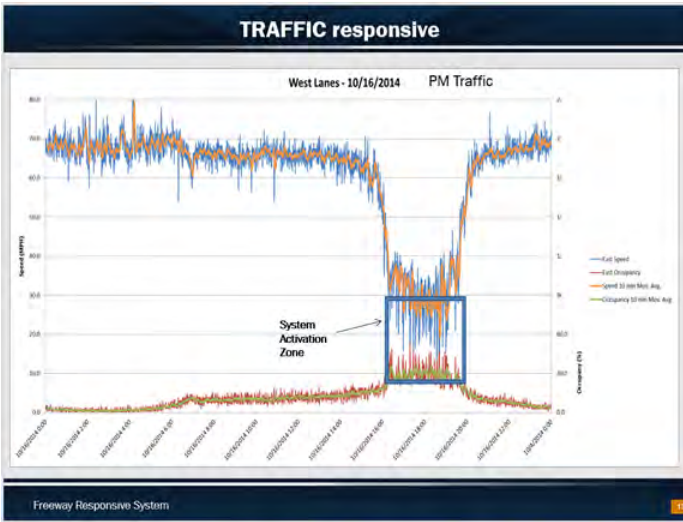
Sensors installed on IH 10 on pole.



Intersection antenna.



Project limits



System activation.



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