



# TEXAS DEPARTMENT OF TRANSPORTATION

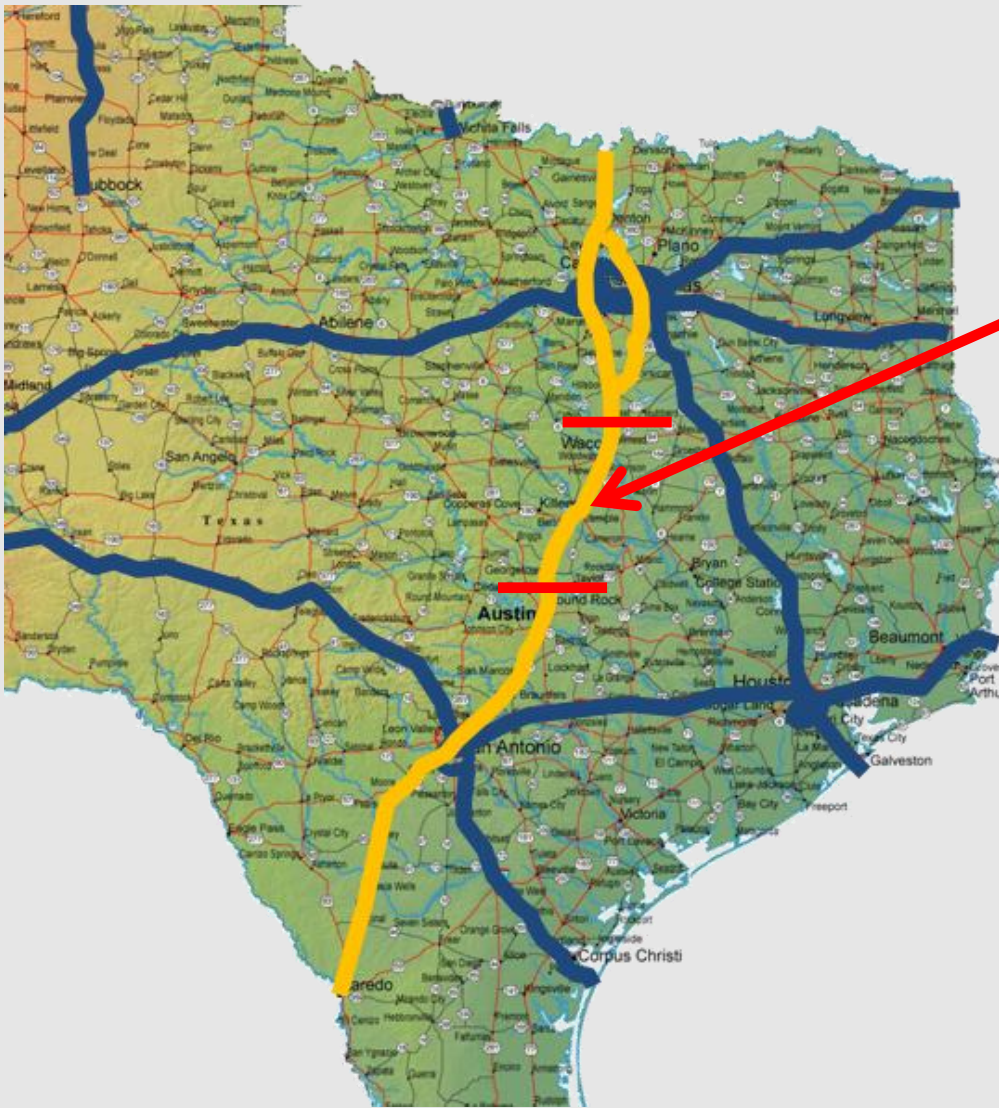


## I-35 SMART WORK ZONE UPDATE

John Habermann, P.E.  
WASHTO 2015 Subcommittee  
on Materials & Construction



# Overview



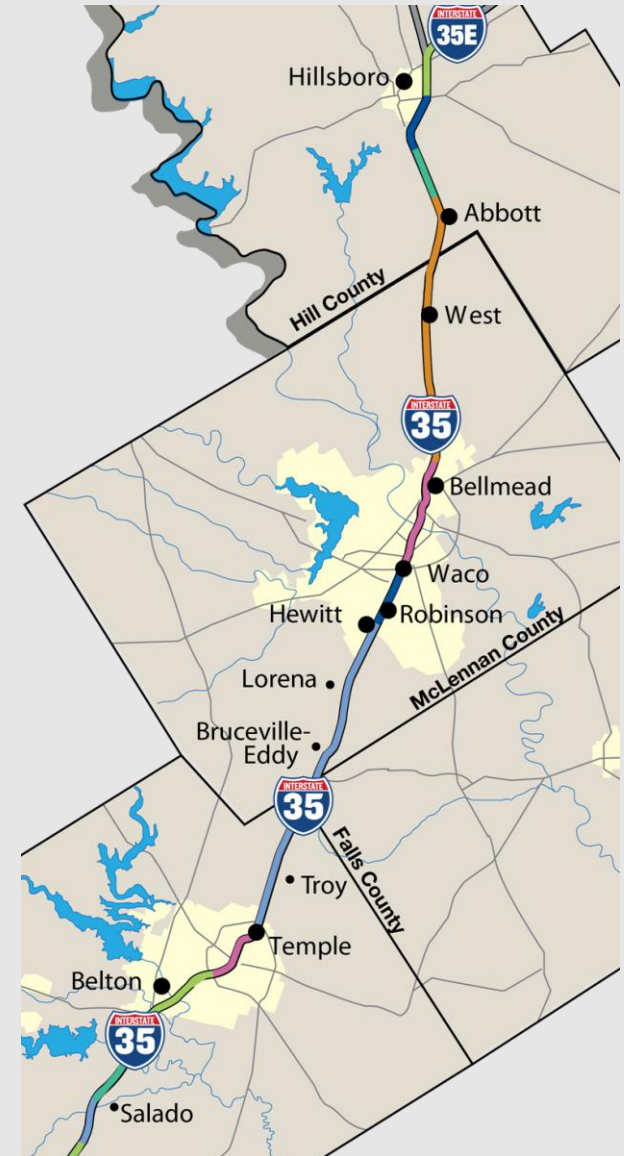
Current scope of I-35 Widening. (South of Salado to Hillsboro)

TxDOT is committed to finishing the widening of Main Street Texas (I-35) to six lanes from San Antonio to Hillsboro.

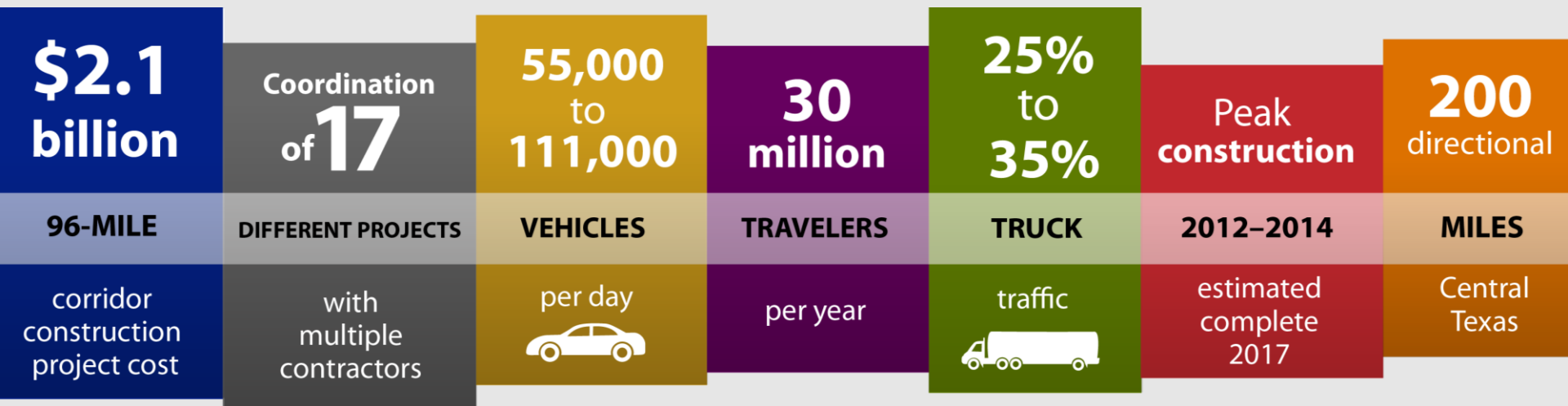


# Overview

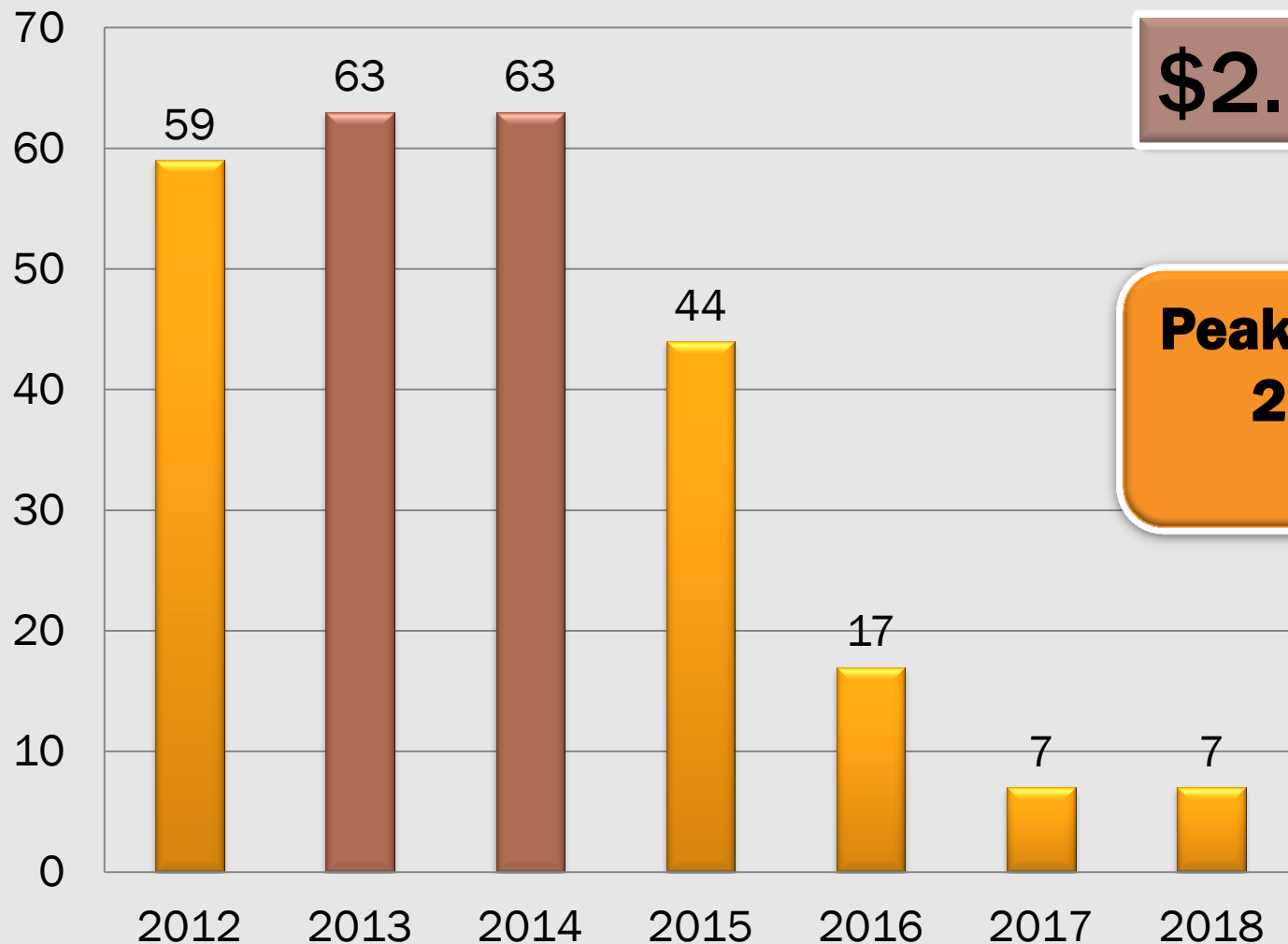
- 200 directional miles – Central Texas
- 14 segments / 19 projects
- Costs: ~\$2.1B
- Traffic Volumes
  - 55,000 – 111,000 vehicles/day
  - Trucks: 25% – 30%
  - Over 5 years ~ 185 million trips
- TxDOT mitigation of impacts
  - Limited lane closures
  - Blackout dates
  - Completion incentives
- Complete 2018



# I-35 Demographics



## I-35 Miles Under Construction




**\$2.1 Billion**

**Peak Construction:  
2013–2014  
63 miles**

# Traveler Information During Construction

- Provide information on current and forecasted travel conditions across multiple construction zones to assist:
  - Local residents
  - Regional travelers
  - Long-distance travelers
- Focus of system is on the construction-related impacts

# I-35 Construction Traveler Information System Components

- Real-time queue warning
  - Lane and road closure information
  - Current travel time information
  - Expected construction delay information
  - Volume and spot speed data
  - Traffic cameras at high incident locations
  - Portable Changeable Message Signs
- 

# Current I-35 field deployments

## ■ Bluetooth

- Travel time detection
- 40 segments, 2-5 miles in length

## ■ Wavetronix

- Volume detector sites
- 17 sites with volume/classification

## ■ CCTV

- Digital with PTZ
- 6 current, at locations of interest

## ■ PCMS

- Display travel time messages

- ~10 per direction at ~10 mile spacing





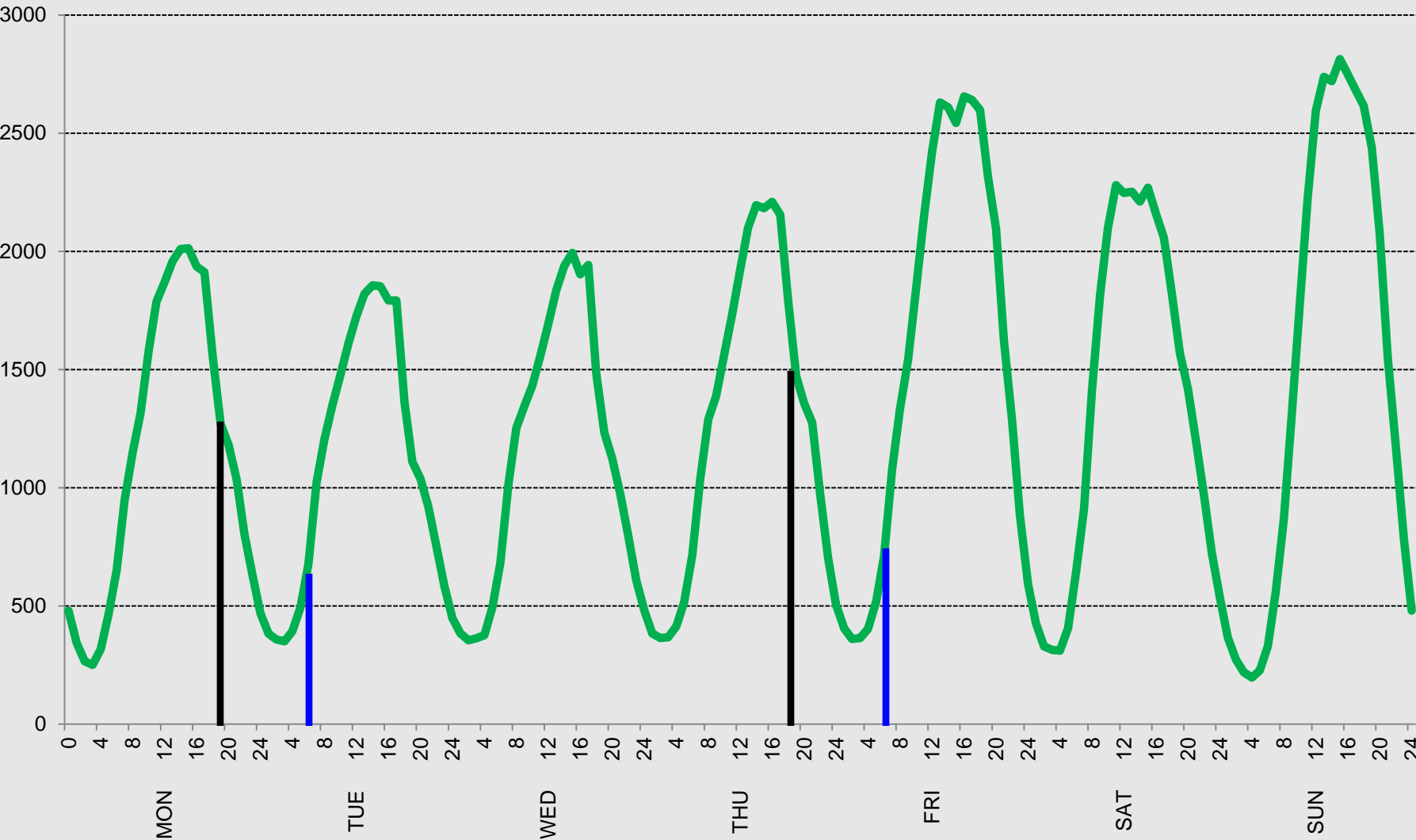
# Travel Time Information Component

- Point-to-point travel times obtained via Bluetooth technology
- Presented for short distances ahead on PCMS signs throughout the corridor
- Travel times are automatically updated every 5 minutes through Center-to-Center protocol and TxDOT's Lonestar ITS platform



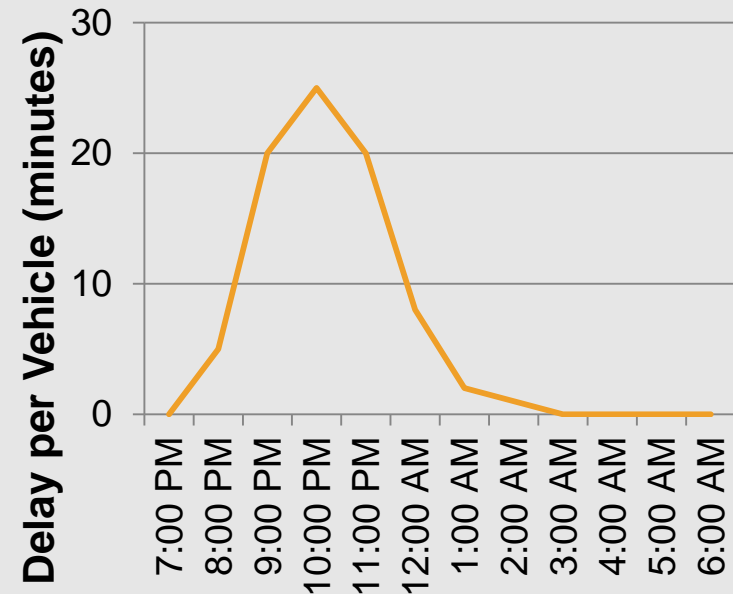
# Examples of Support: Lane Closures

Historical Hourly Volumes on IH-35 Southbound at West South (Tokio Rd.)  
(6-month average)



# Lane and Road Closure Information Component

- Database of all planned closures maintained
- Public closure notices:
  - Daily
  - Rolling 7-day advance schedule (2x weekly)
  - High-impact only
- Each freeway lane closure analyzed to predict queues and delays

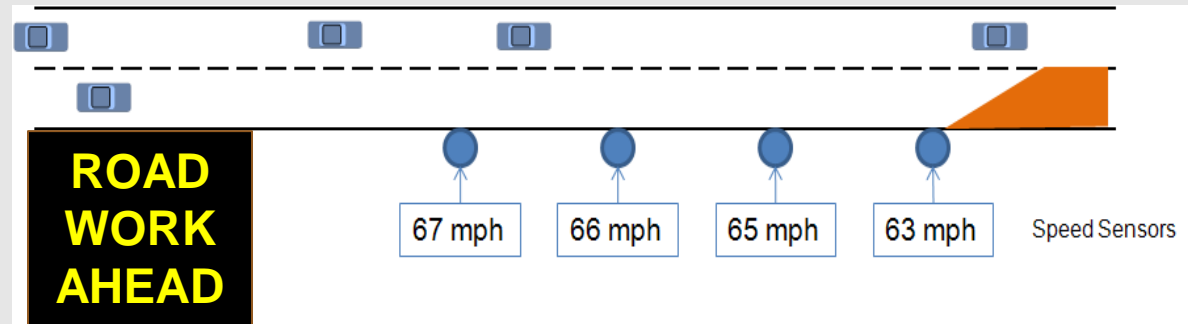


# Lane Closure Analysis

Southbound	1A	1B	1C	2A	2B	3A-1	3A-2	3B	3C	4	4A	BRB	5A	5B	5C	Total Delay	Total Travel Time	% Delay
7 PM	0	6.8	0	0	0	0	0	8	0	0	0	0	0	7.6	0	22.4	122.4	22.4
8 PM	0	8.3	0	0	0	0	0	10.8	0	0	0	0	0	7.4	0	26.5	126.5	26.5
9 PM	0	7.5	0	0	0	0	0	10.8	0	0	0	0	0	0	0	18.4	118.4	18.4
10 PM	0	3.2	0	0	0	0	0	8.1	0	0	0	0	0	0	0	11.3	111.3	11.3
11 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0
12 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0
1 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0
2 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0
3 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0
4 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0
5 AM	0	3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	3.4	103.4	3.4
6 AM	0	0	0	0	0	0	0	5.4	0	0	0	0	0	0	0	5.4	105.4	5.4

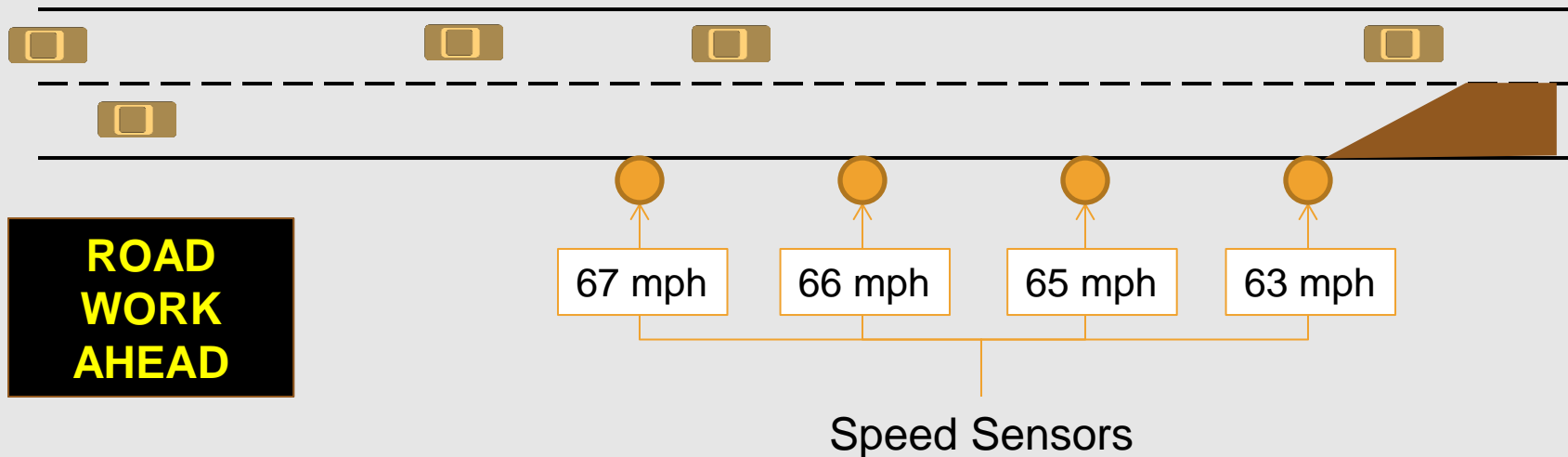
# End of Queue Warning Safety System

- Automated monitoring near a work zone
- Warning of slow speeds
- Warning of end of 'stop and go' traffic

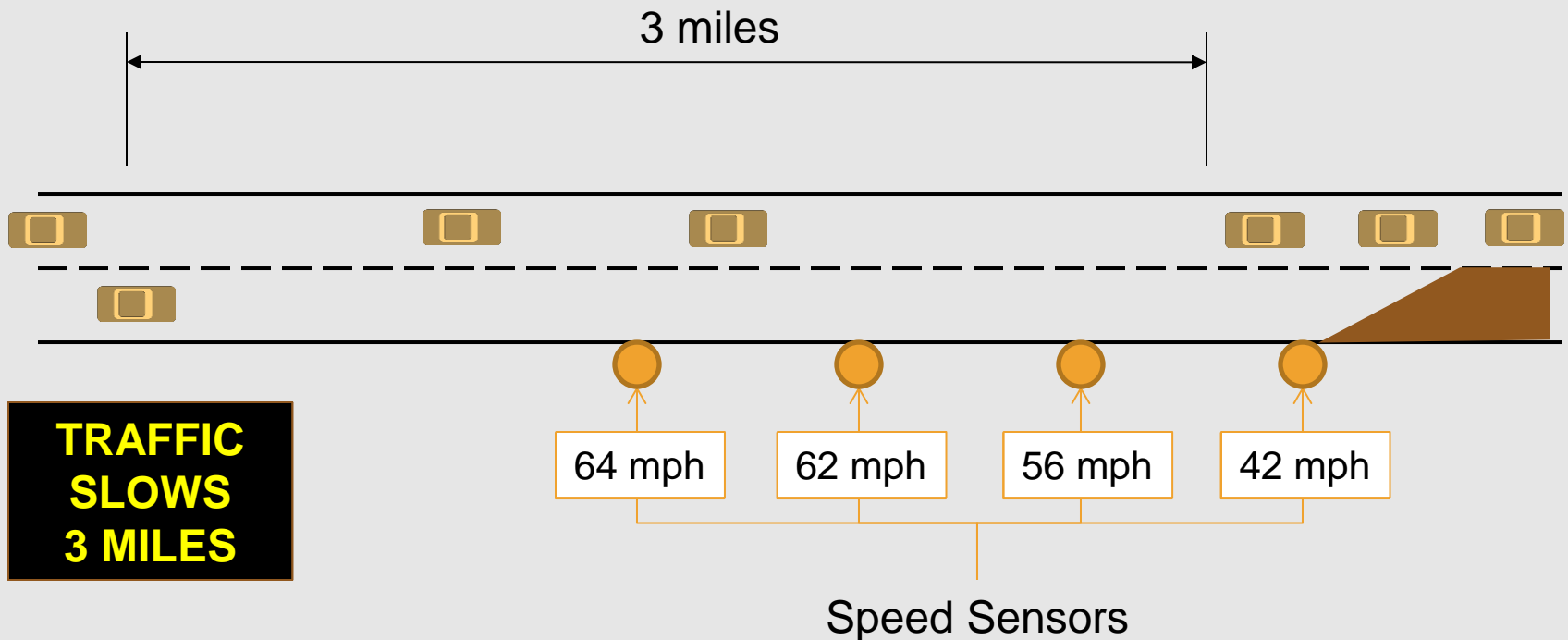




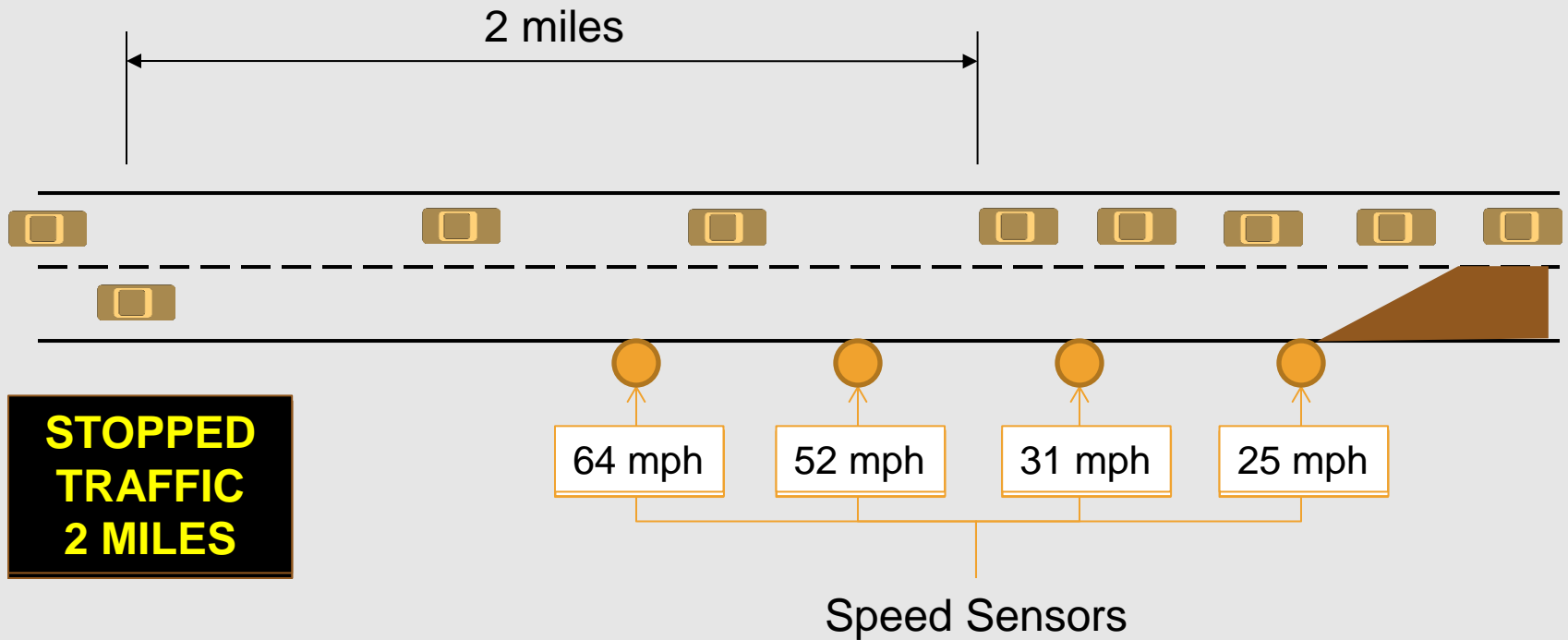
# Real-Time Queue Warning Component



## Real-Time Queue Warning Component



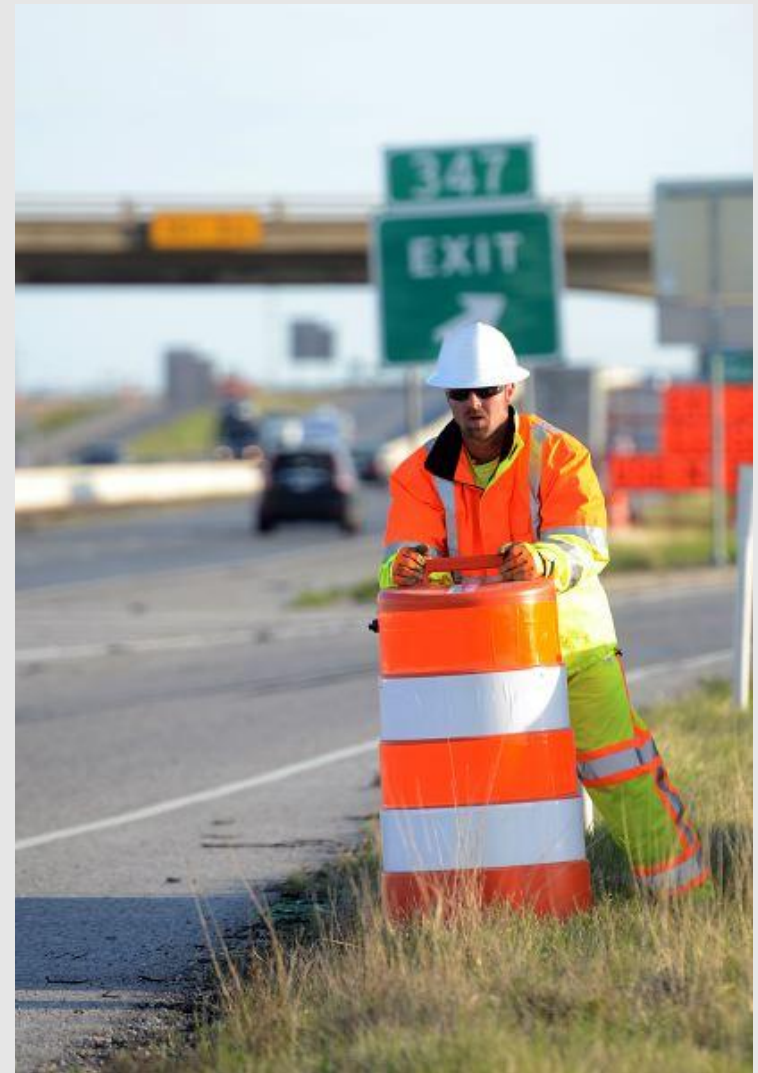
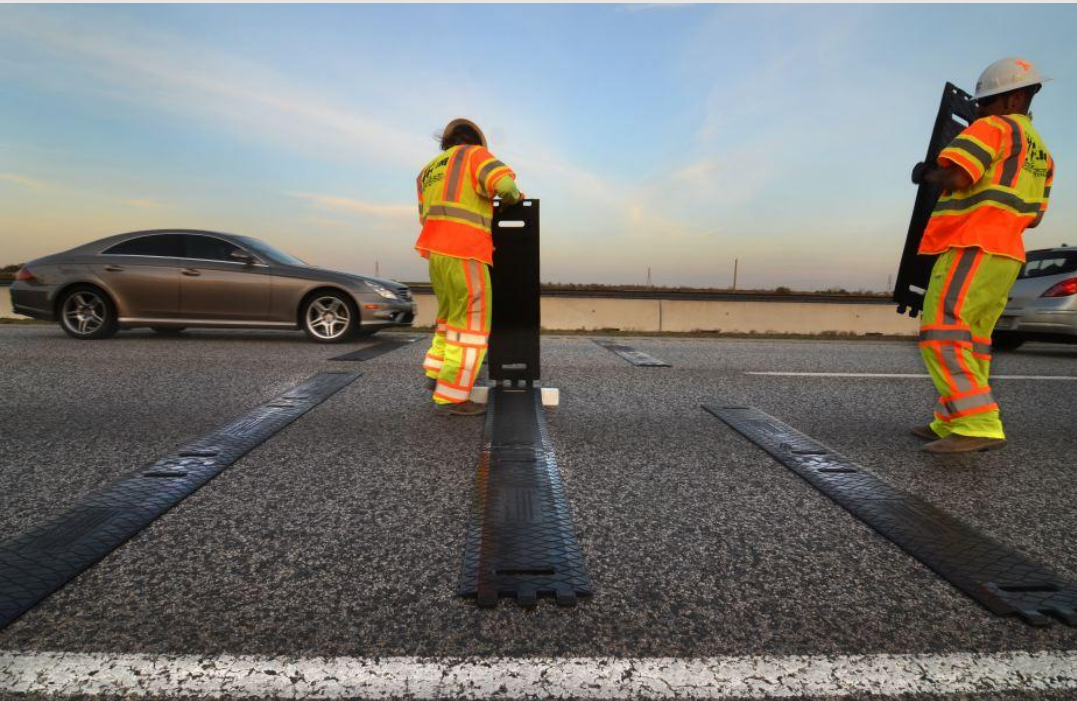
# Real-Time Queue Warning Component



# I-35 Smart Work Zones

PCMS Message	Last 5-Minute Average Speed V (mph)			
	④	③	②	①
ROAD WORK AHEAD	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0
SLOW TRAFFIC 3 MILES	V > 55 OR V = 0.0	V > 55 OR V = 0.0	V > 55 OR V = 0.0	$40 \leq V < 55$
SLOW TRAFFIC 2 MILES	V > 55 OR V = 0.0	V > 55 OR V = 0.0	$40 \leq V < 55$	V > 40 OR V = 0.0
SLOW TRAFFIC 1 MILE	V > 55 OR V = 0.0	$40 \leq V < 55$	V > 40 OR V = 0.0	V > 40 OR V = 0.0
SLOW TRAFFIC AHEAD	$40 \leq V < 55$	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0
STOPPED TRAFFIC 3 MILES	V > 40 OR V = 0.0	V > 40 OR V = 0.0	V > 40 OR V = 0.0	$0.0 \leq V < 40$
STOPPED TRAFFIC 2 MILES	V > 40 OR V = 0.0	V > 40 OR V = 0.0	$0.0 \leq V < 40$	Any value
STOPPED TRAFFIC 1 MILE	V > 40 OR V = 0.0	$0.0 \leq V < 40$	Any value	Any value
STOPPED TRAFFIC AHEAD	$0.0 \leq V < 40$	Any value	Any value	Any value

# I-35 Smart Work Zones





# I-35 Smart Work Zones



# Variable Speed Limits



# Questions or Comments