

# Partnerships for Transportation System Management and Operations

Christopher Poe, Ph.D., P.E., Assistant Director,  
Connected and Automated Transportation Strategy

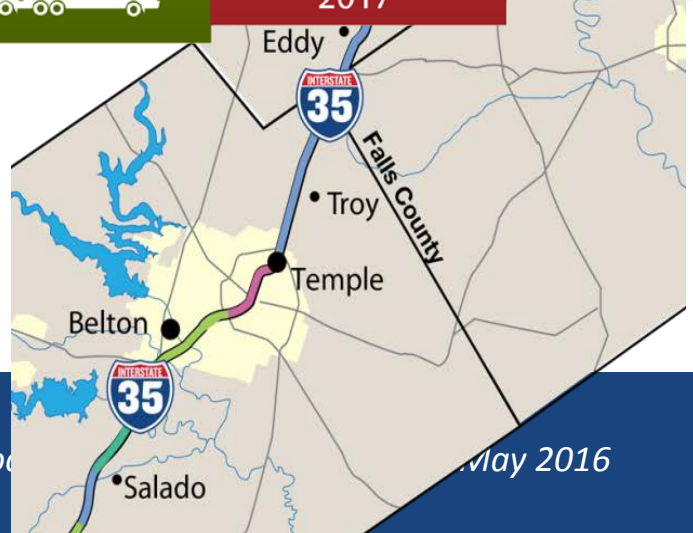
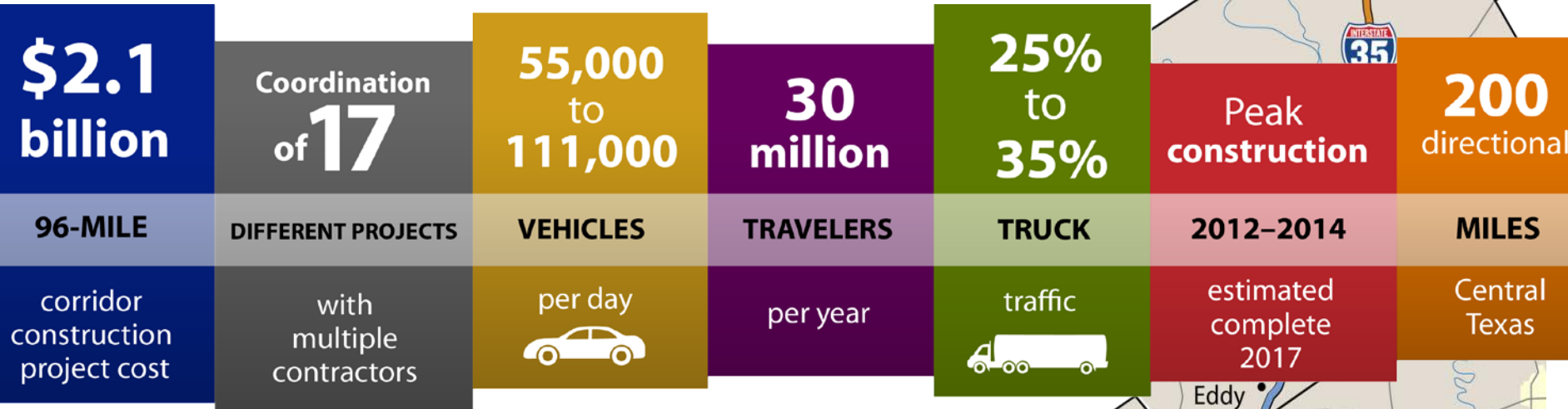


# TSM&O

- Transportation System Management & Operation
  - Both tolled and non-tolled facilities
  - Requires operations mind set
  - Not enough to operate your facility well
  - Increasingly proactive
  - Measure and improve



# I-35 Widening Project





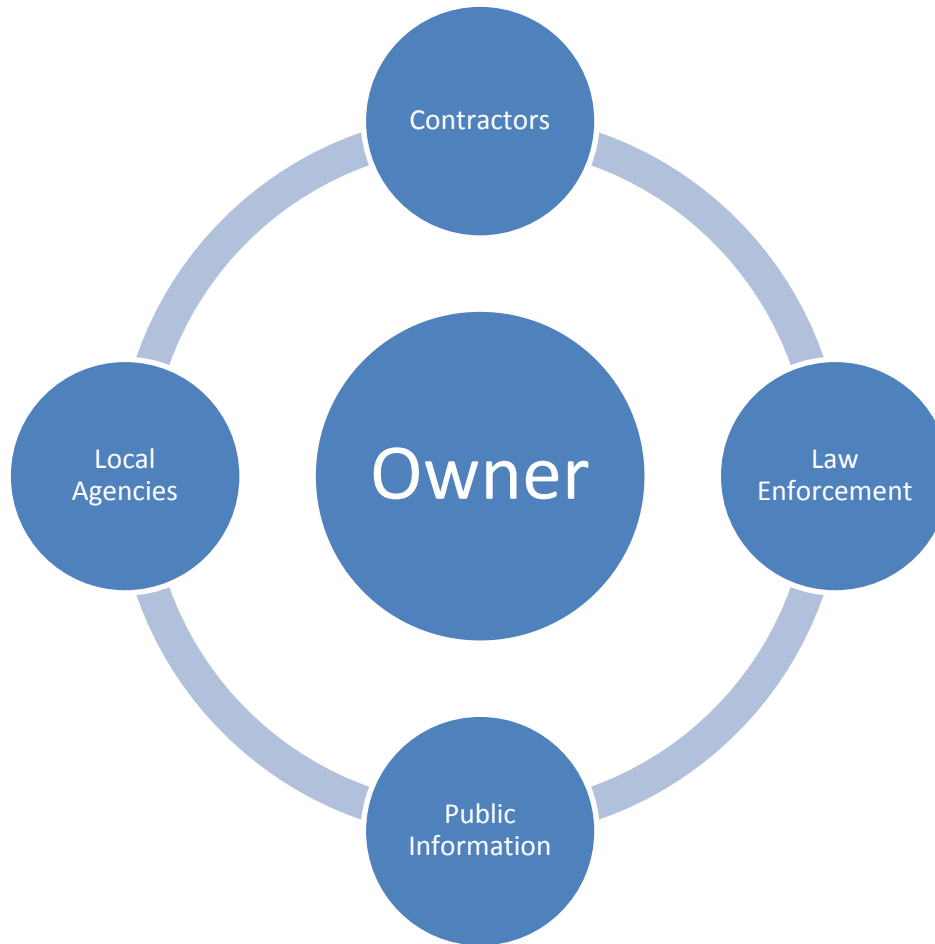
# Work Zones Challenges

- Work zones create:
  - Geometric constraints (loss of shoulders / narrow lanes)
  - Congestion for lane closures
- Often unexpected (mid-day, night)
- Construction coincides with high truck travel
- Phases of construction:
  - Create dynamic environment
  - Restrict right-of-way
  - Disrupt utilities





# Construction Partnerships





# Infrastructure



BT Readers



PCMS



Queue Warning Systems



Wavetronix  
Volume  
Sensors



CCTV



- Started with I-35
- Temporary Infrastructure
- Transitioning to Permanent as available
- Alternate routes
- Detour routes
- [Google Earth File](#)

# Customer Travel Information

72337

05/16/2016 Mon

**TxDOT I-35 Alerts:**  
Waco - Vehicle Collision  
Status Detected - New  
I-35 NB @ 4th St/5th St  
At MM 335  
(1/2)

9:12 AM

**TxDOT I-35 Alerts:**  
Est. Backup 2-4 miles  
More details: <http://kaduh1.info/AvoGvQy>  
(2/2)

9:16 AM

**TxDOT I-35 Alerts:**  
Waco - Vehicle Collision  
Status Cleared - Update  
I-35 NB @ 4th St/5th St  
At MM 335

Enter message

TravelTimes  
5 through Central Texas  
...dor · my35.org

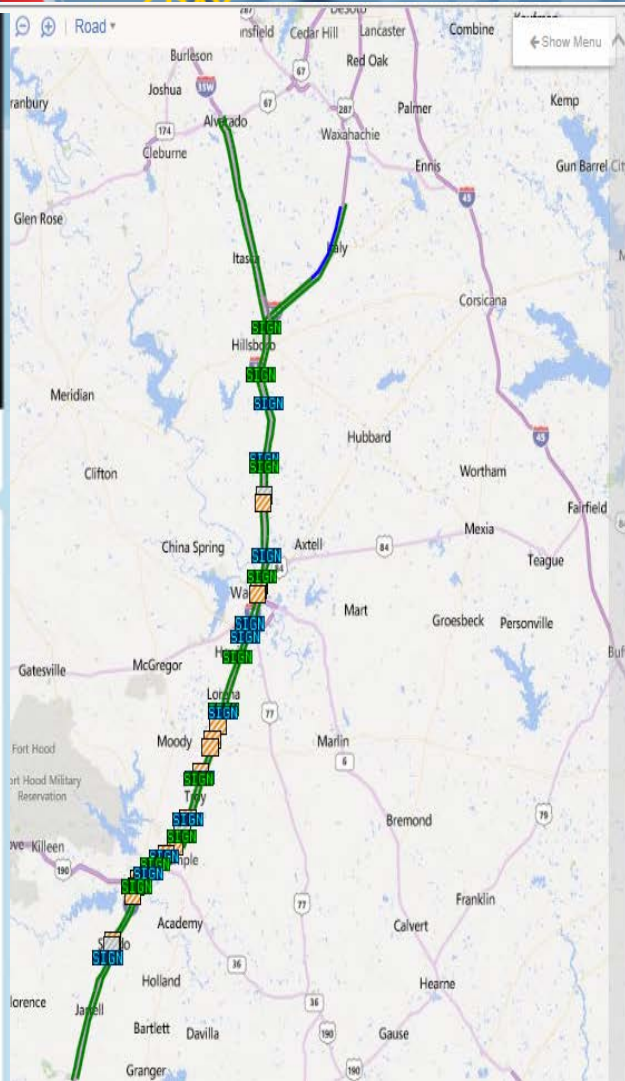
Follow

...s - 9h  
...rs Ln~MM 339) to West (County Line  
11:54 PM #My35CentralTexas

...s - 9h  
...rs Ln~MM 339) to West (County Line  
11:34 PM #My35CentralTexas

...s - 10h  
...rs Ln~MM 339) to West (County Line  
11:14 PM #My35CentralTexas

...s - 10h  
I-35 NB: S of Lacy Lakeview (Meyers Ln~MM 339) to West (County Line  
Rd~MM 355) - 12 miles - 43 min @ 11:09 PM #My35CentralTexas



MAP
LINK
LINK
MAP
LINK
LINK
LINK
MAP
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LINK

May 2016

# Prediction



LISTING COVERS 7AM THURSDAY, APRIL 30 THROUGH 7AM FRIDAY, MAY 1

This listing is subject to change due to inclement weather or other unforeseen events that may occur.

**Hide Summary**

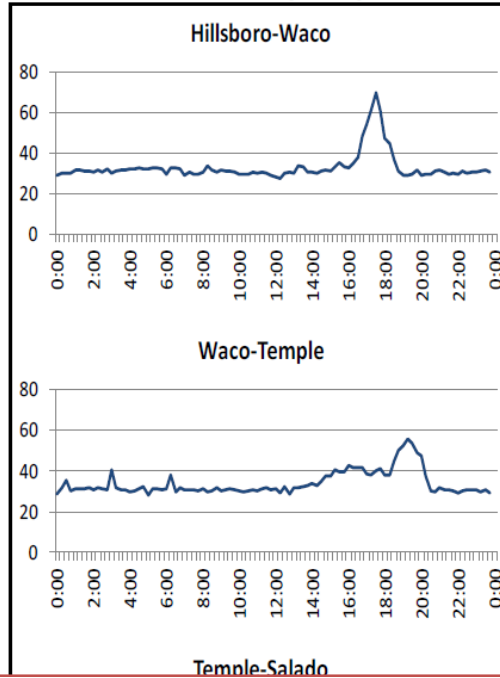
## Expected Delay Summary (in minutes)

Northbound	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	0	0	0	0	0	0	0	0	10.3	0	0	0	0	0	10.4	110.4	10.4
8 PM	0	0	0	0	0	0	0	0	0	13.2	0	0	0	0	0	13.2	113.2	13.2
9 PM	0	0	0	0	0	0	0	0	0	13.7	0	0	0	0	0	13.7	113.7	13.7
10 PM	0	0	0	0	0	0	0	0	0	11.9	0	0	0	0	0	11.9	111.9	11.9
11 PM	0	0	0	0	0	0	0	0	0	7.1	0	0	0	0	0	7.1	107.1	7.1
12 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	102	2
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	0	0	0	0	0	0	0	0	4.8	0	0	0	0	0	4.8	104.8	4.8
6 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0

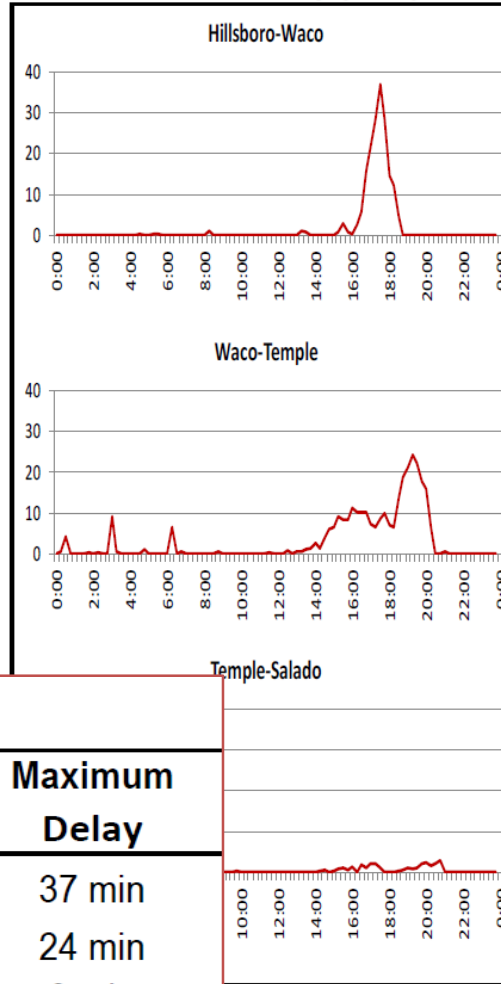


# Measurement

Travel Time (min)



Delay (min)



## Southbound

	Maximum Travel Time	Maximum Delay
Hillsboro-Waco:	70 min	37 min
Waco-Temple:	56 min	24 min
Temple-Salado:	24 min	3 min

Grade: D



# End-of-queue warning systems

- More than 450 deployment nights
- Specialty deployments
  - DPS investigations
  - Semi-permanent locations
  - Waco 6-bridge package
- TxDOT pioneered approach
- Several states now following and looking at alternative contracting
- Key is assessment / business rules



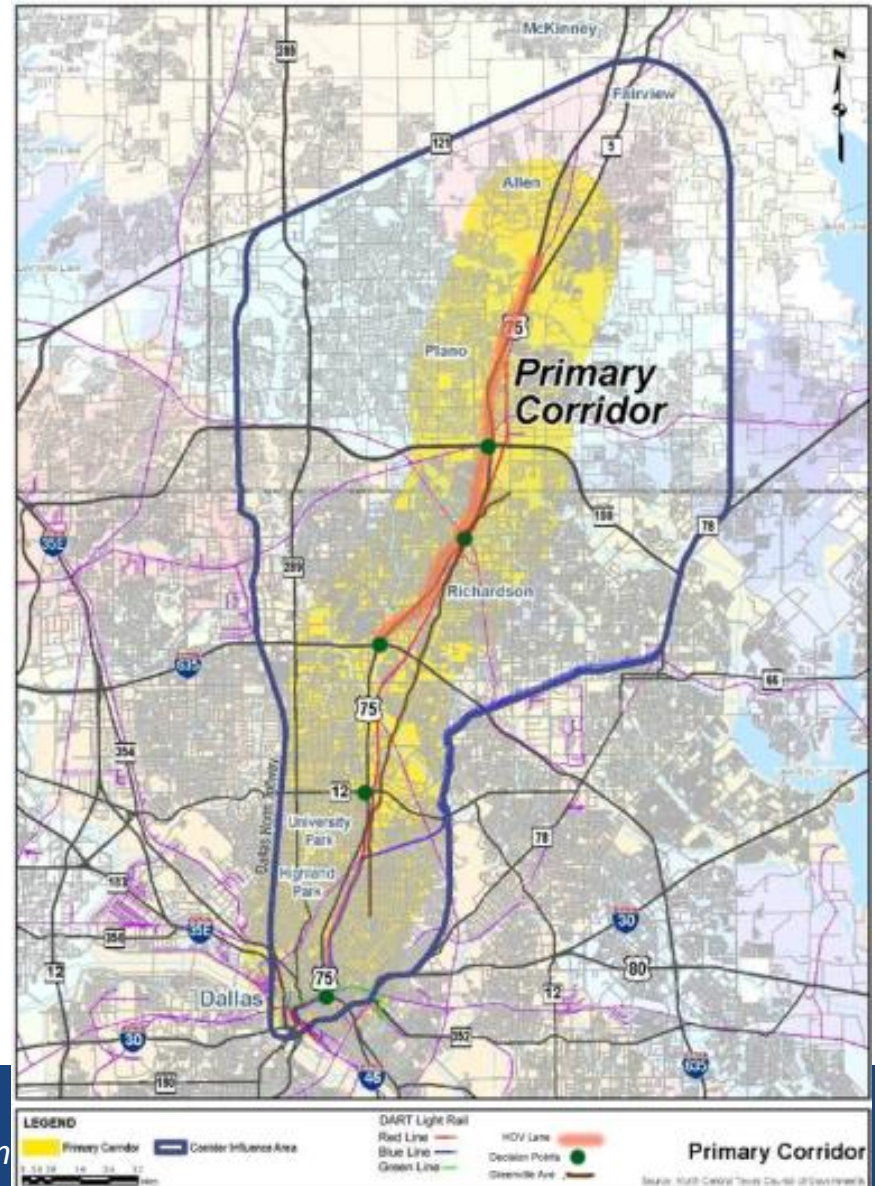


# Impacts and Results

- <5% of closures result in delays more than 30 minutes (3,700+ closures to date)
- 87% think information is nearly always accurate
- 62% have changed plans based on the information
- 20-40% reduction in crashes over what would have occurred if EOQ systems not in place

# US 75 Corridor Networks

- Freeway with continuous Frontage Roads
- Managed HOV lanes
- Dallas North Tollway
- Arterials
- Bus Network
- Light Rail
- Approx. 900 Signals
- Multiple TMCs
- Regional ATIS





# US 75 ICM Vision

**Operate the US 75 Corridor in a true multimodal, integrated, efficient, and safe fashion where the focus is on the transportation customer**

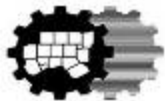
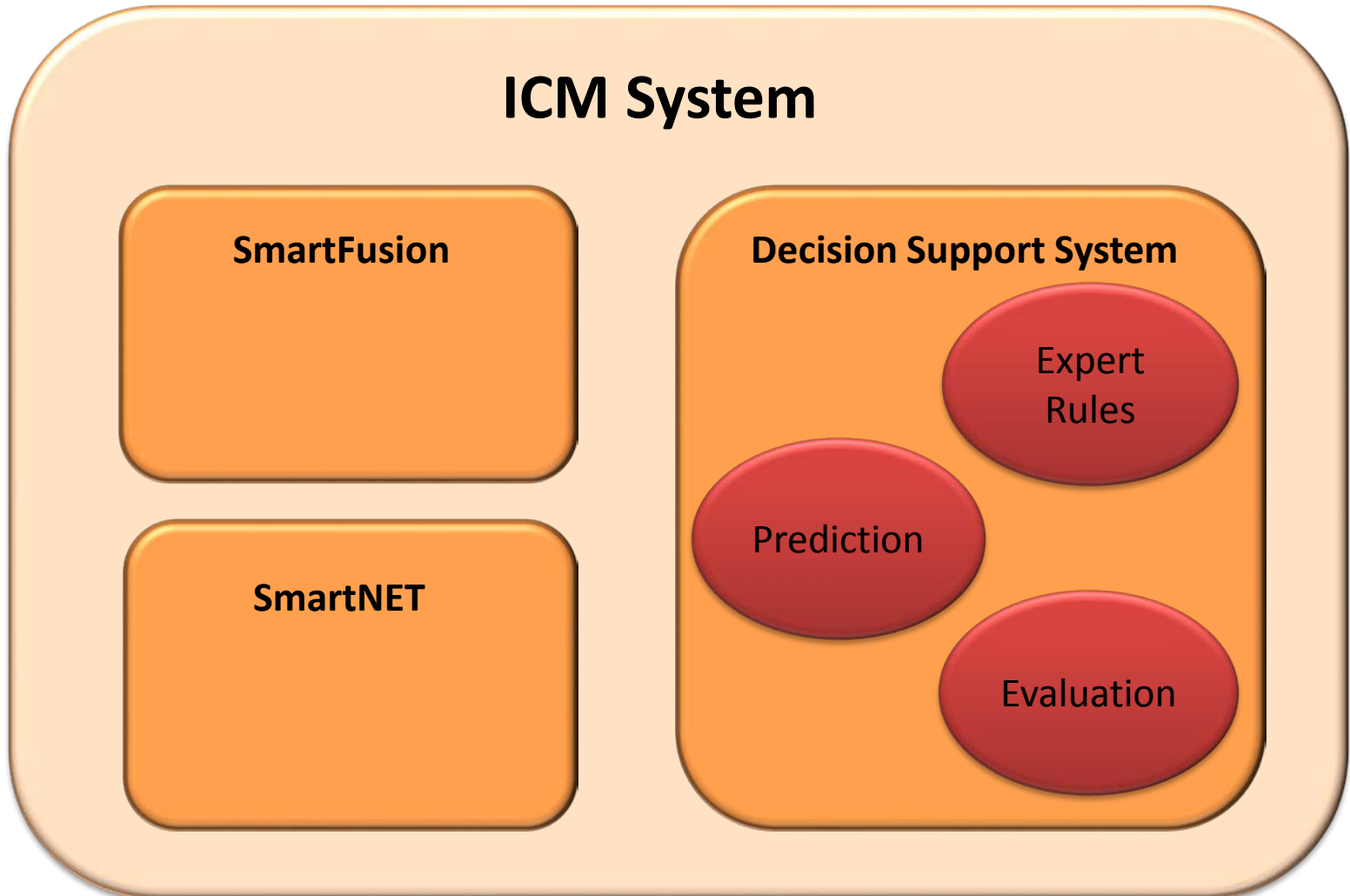




# Operational Partners

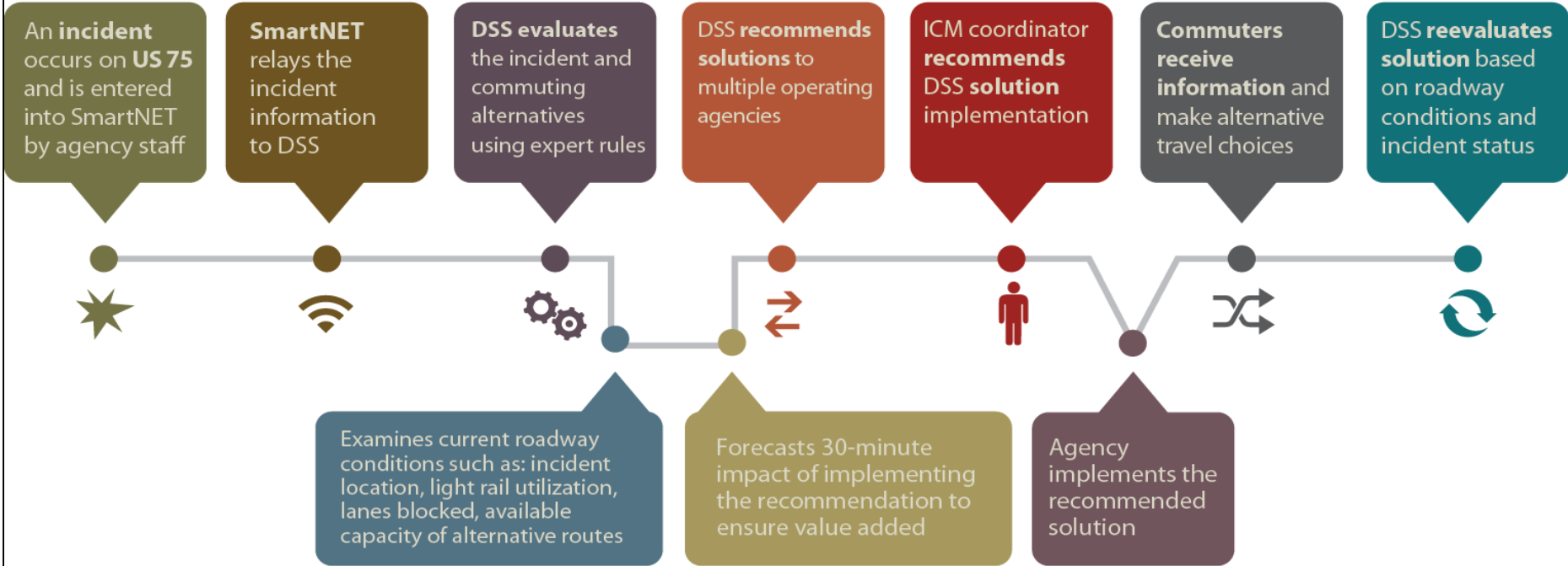
- Dallas Area Rapid Transit
- Texas DOT
- North Texas Tollway Authority
- Cities
  - Dallas
  - Plano
  - Richardson
- North Central Texas Council of Governments
- Contractor Team (TTI, Telvent, SMU, UT Arlington)

# DSS Subsystem Components



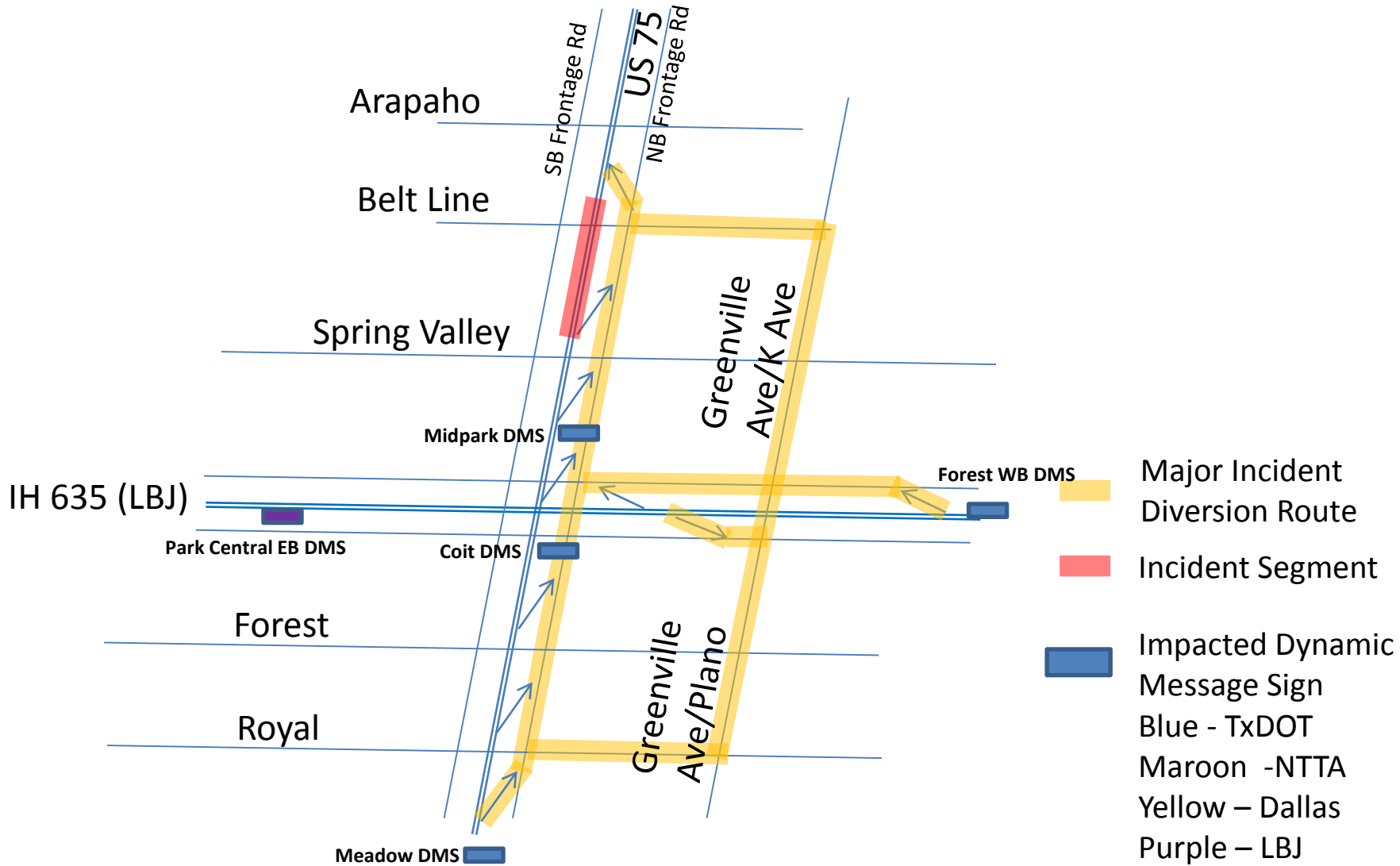
# ICM Decision Support System

## THE PROCESS





# Diversion Strategy





# Partnership Lessons Learned

- Individual agencies operate their systems well
  - Opportunities for advancement are in coordinated management
- Gain stakeholder trust
- Need common, reliable data platforms for decision making
- Build on existing institutional arrangements

# Questions?

- Christopher Poe  
(972) 994-0433  
cpoe@tamu.edu

- TTI

- <http://tti.tamu.edu>

