

# INTELLIGENT TRANSPORTATION SYSTEMS

## OCARTS AREA

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**REGIONAL TRANSPORTATION PLANNING**

acog

# OUTLINE

- Association of Central Oklahoma Governments and the Oklahoma City Area Regional Transportation Study Region
- Metropolitan Planning and ITS
- Continual ITS Planning Products and Integration
- Future Goals and Data Needs

**OCARTS:** Oklahoma City Area Regional Transportation Study

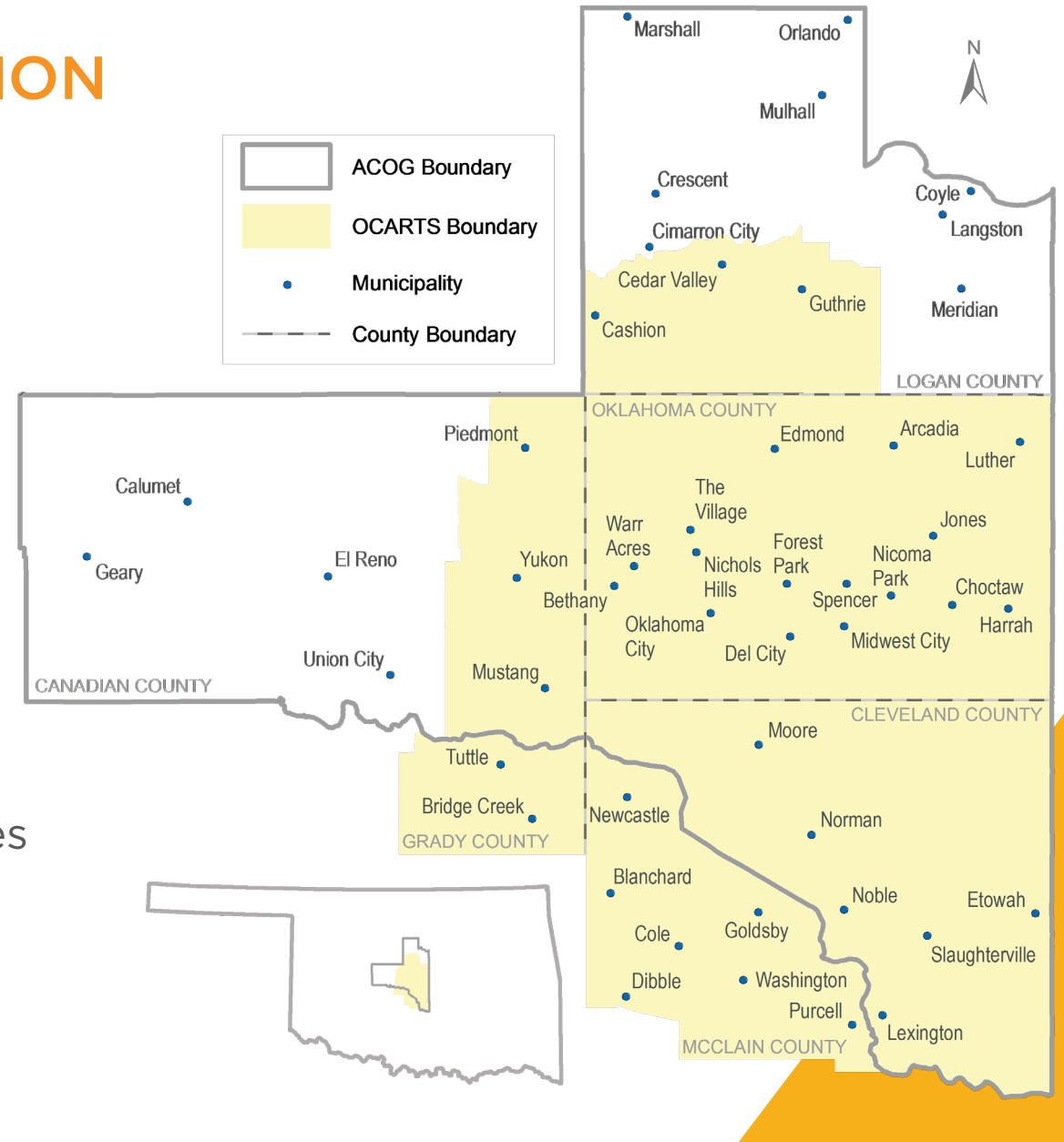
**ACOG:** Association of Central Oklahoma Governments

# ACOG AND THE OCARTS REGION

- 2,000 square miles
- 47 Cities
- 6 Counties (some partial)
- 2010 Population - 1.1 Million
- 2040 Projected population – 1.6 Million

## ACOG staff work on four missions:

- Economic Development
- 9-1-1 Administration
- Transportation and Planning/MPO Services
- Water Resources



# METROPOLITAN PLANNING AND ITS

- Regional ITS coordination
- Data collection and information distribution
- Encouraging and funding ITS project implementation



# ITS PLANNING PRODUCTS AND INTEGRATION

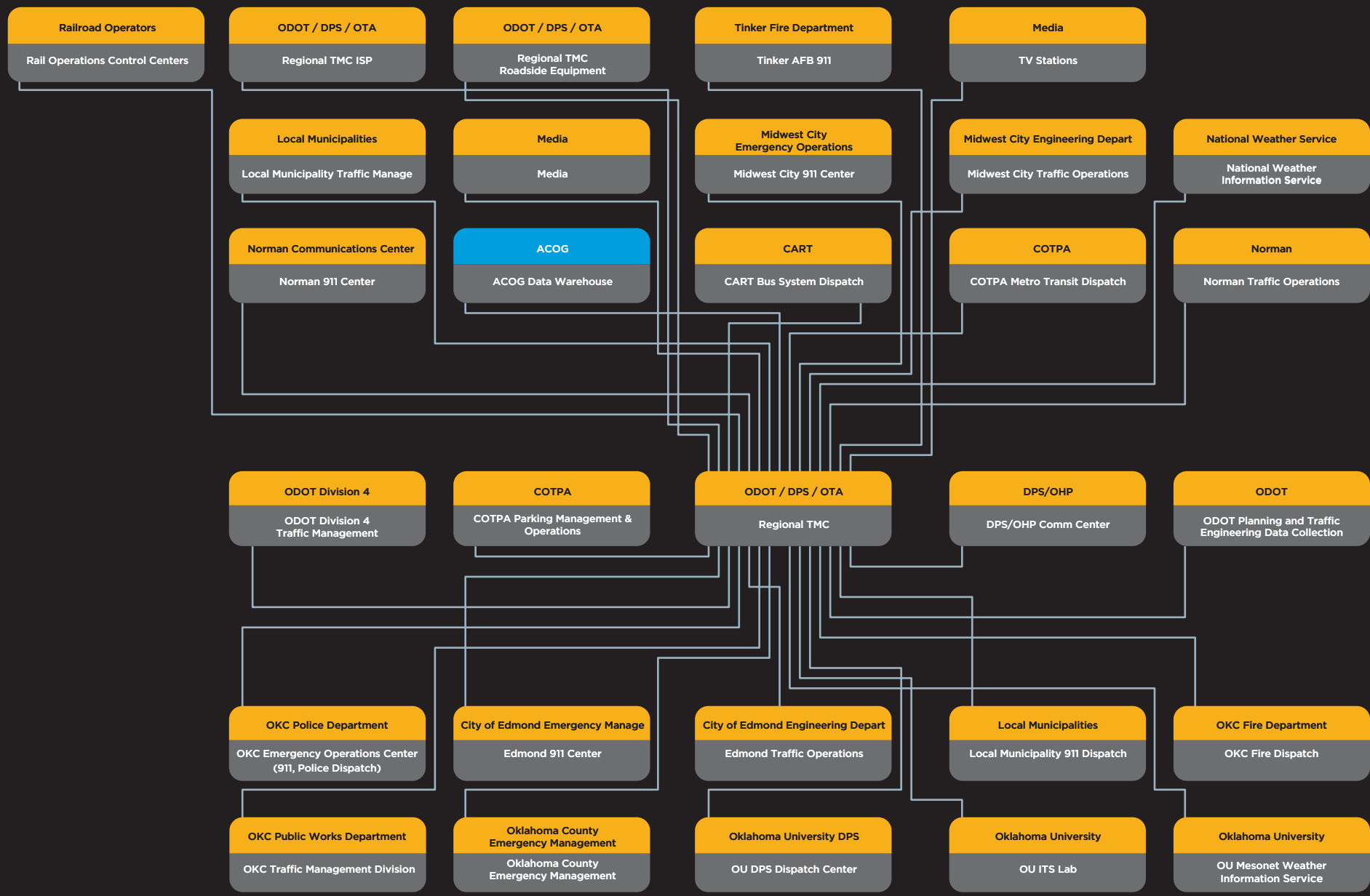
- Network Monitoring Reports
- Regional ITS Architecture
- Metropolitan Transportation Plans (MTP)
- Transportation Improvement Programs (TIP)

# NETWORK MONITORING REPORTS

- Survey of all projects in the region completed the previous year
  - Request locations and project details including ITS projects
- Collecting since 2010
- Incorporate into the long range plan
  - Costs/Financial Planning
  - Modelling
- Make the report available to our members and the public

# ITS ARCHITECTURE

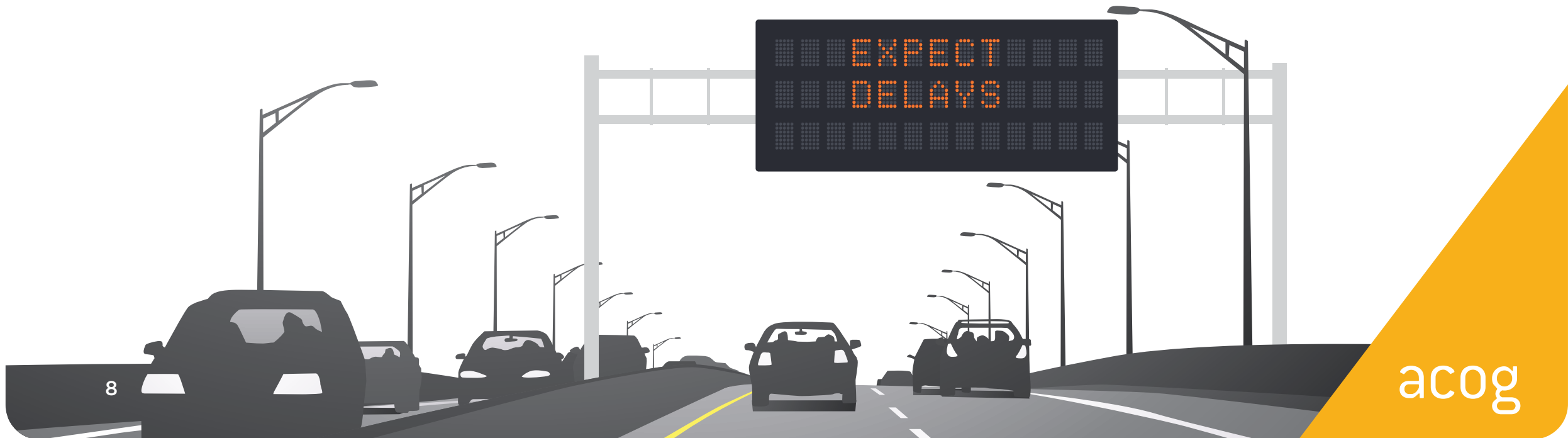
- First OCARTS Area ITS Architecture: 2003
  - Updates in 2007, 2012 and 2016
- Provides an institutional and operations framework for the integration of systems across transportation agency boundaries
  - Roles and responsibilities of all entities
- Maintenance of the Regional ITS Architecture is ongoing as new players and systems come onboard

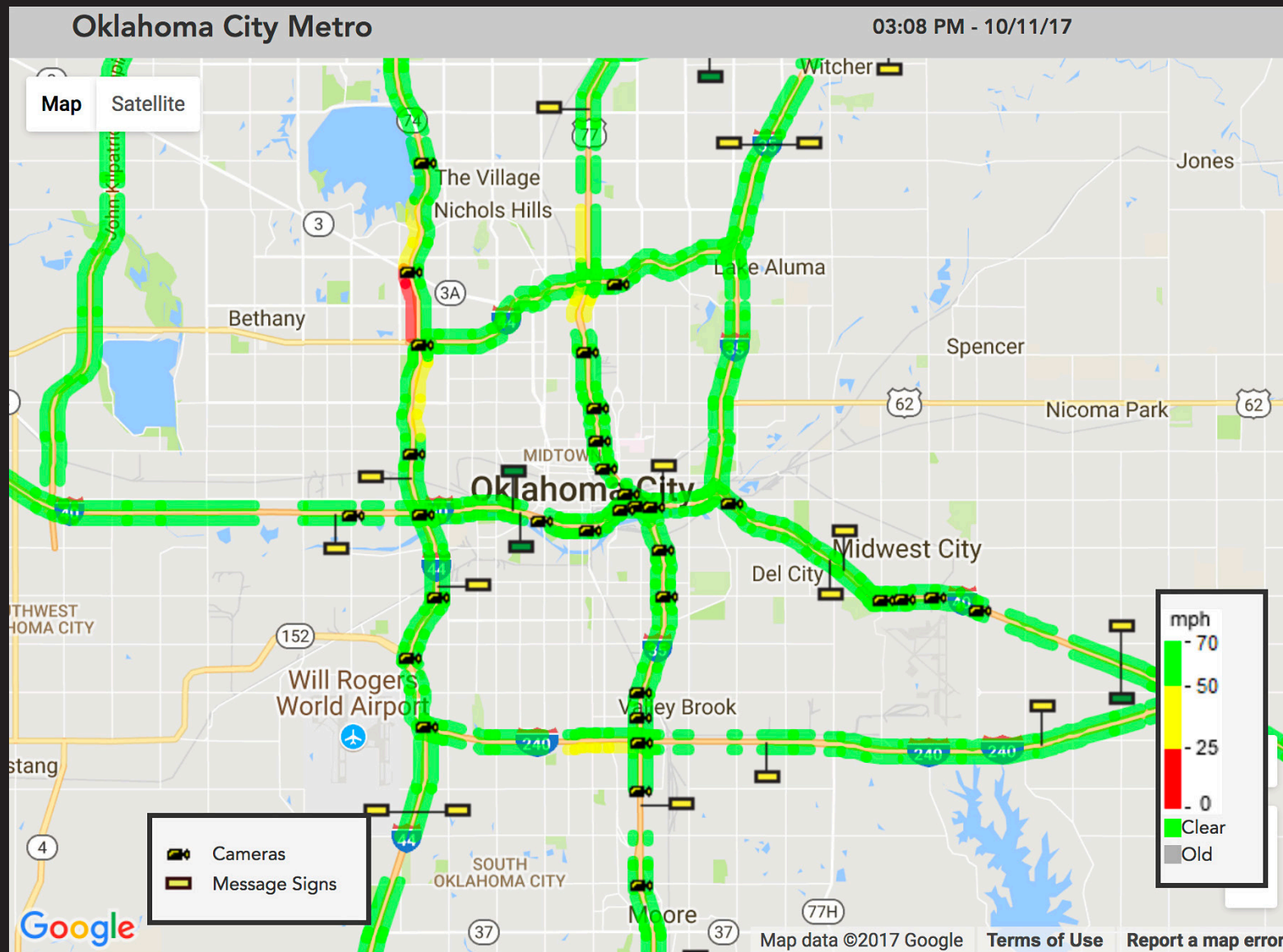




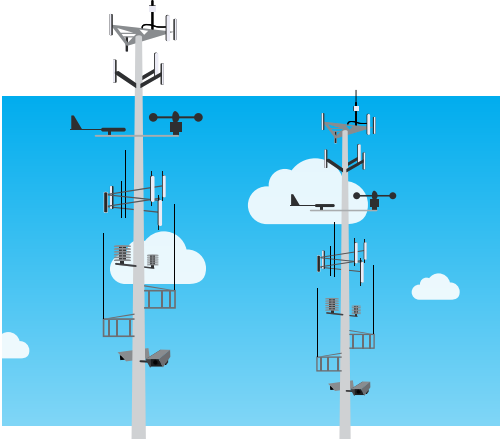
## 2016 REGIONAL UPDATE - ODOT

- The OU ITS Lab hosts an Advanced Traveler Information System (ATIS):
  - Virtual ITS consoles for a more widely distributed system
  - Many locations can work virtually as a traffic management center
- Monitor and Control: Travel Speeds, DMS and Camera Locations, OK Pathfinder Website and work zones





# 2016 REGIONAL UPDATE - ODOT



## RWIS STATIONS

- Roadside Weather Information System
- 5 Deployed so far
- Better monitor road conditions



## SNOW PLOW PLAN

- Plan to equip snow trucks with tablets to track the location of each plow and coordinate their efforts
- Also plan to install cameras on the plows
  - Take pictures at 10 minute intervals
  - Real time road conditions
  - Better inform the public during winter weather



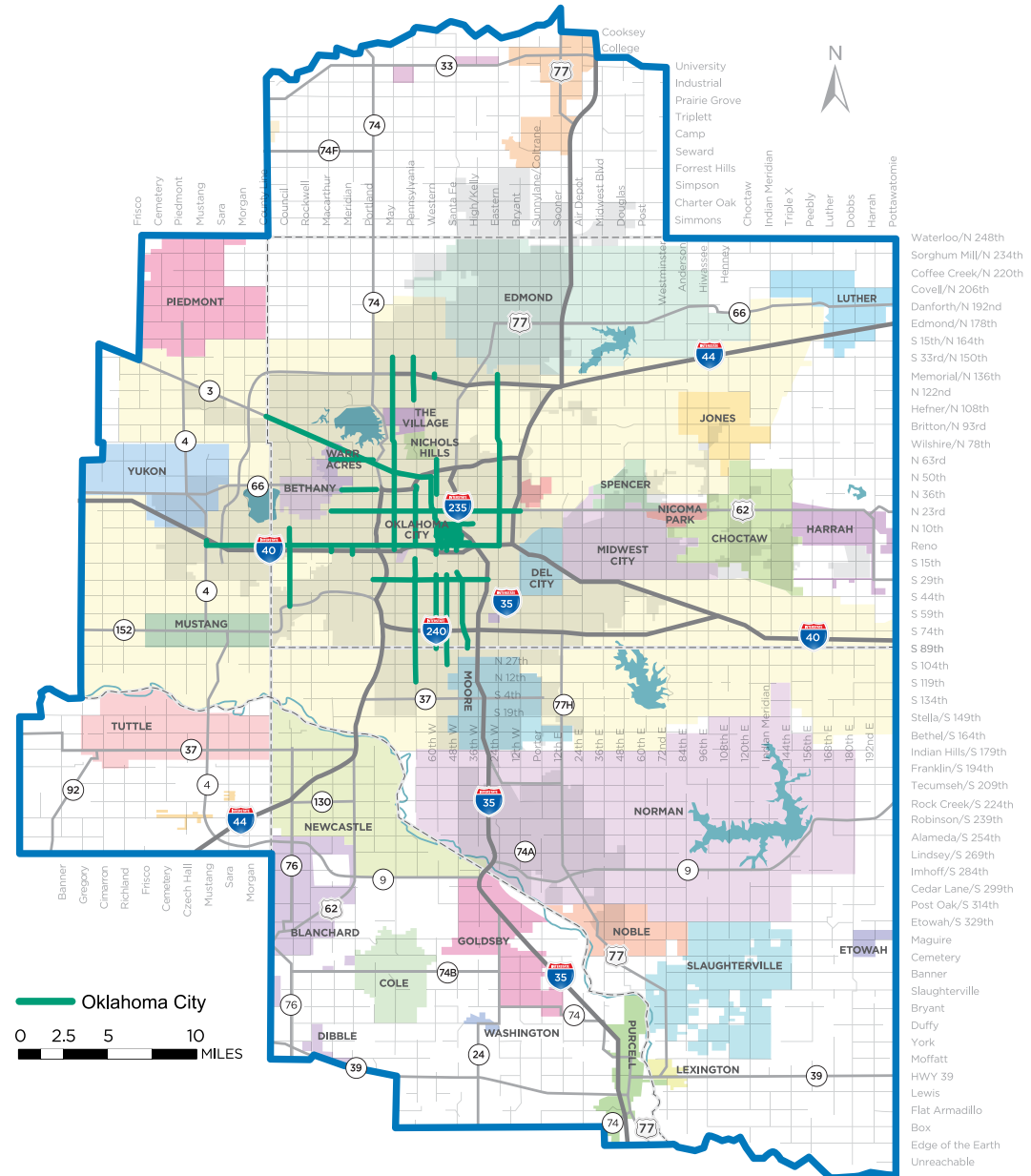
## SMART WORK ZONES

- ITS Fiber optics and vehicle sensors to monitor traffic flow
- Information then relayed to motorists through DMS signs

# 2016 REGIONAL UPDATE

## OKC

- Use a Verizon data modem network to manage traffic signals
- Have 768 signals or 100% of the signals are connected to the network
- Over 114 miles of connected corridors

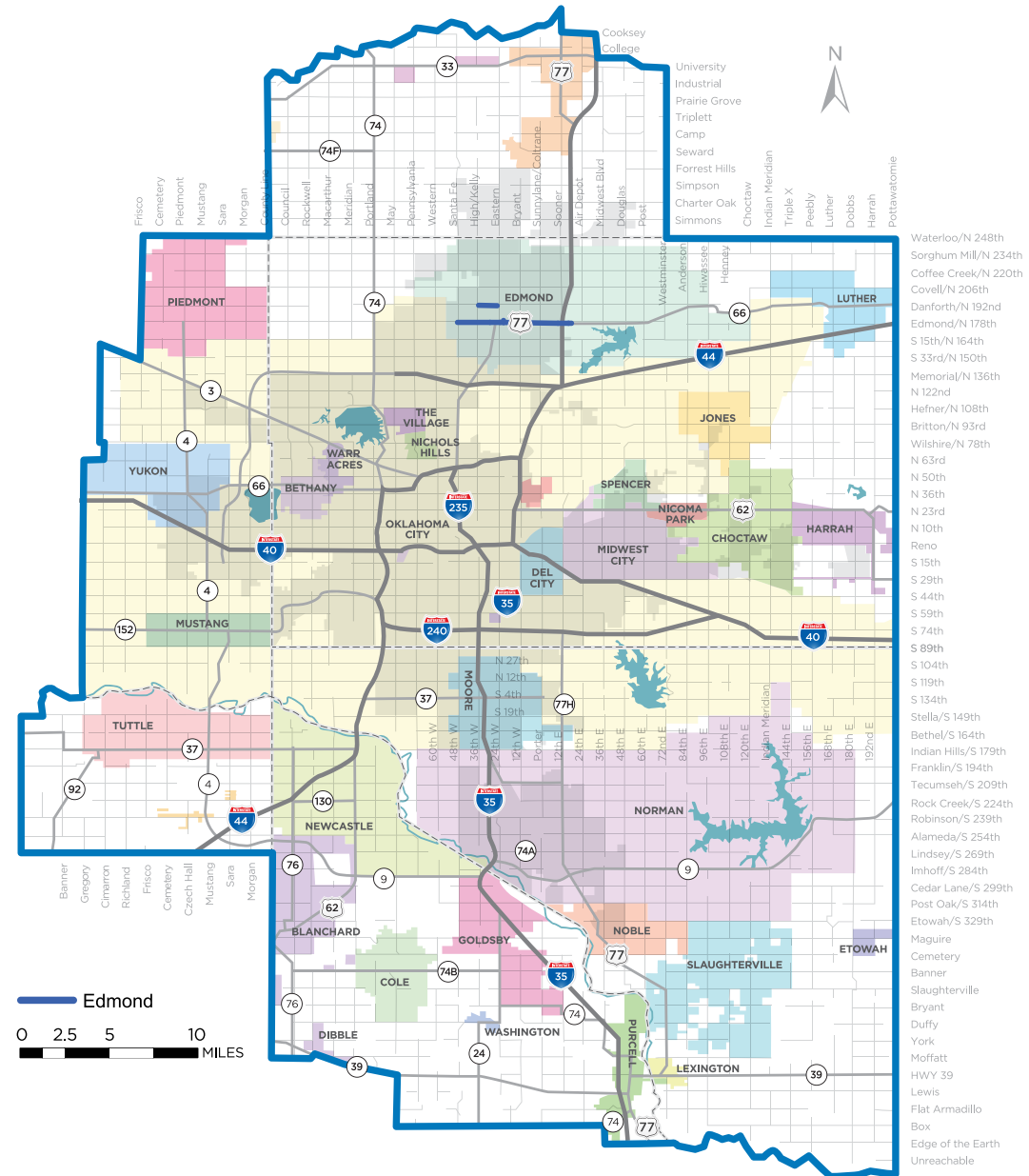




# 2016 REGIONAL UPDATE

## EDMOND

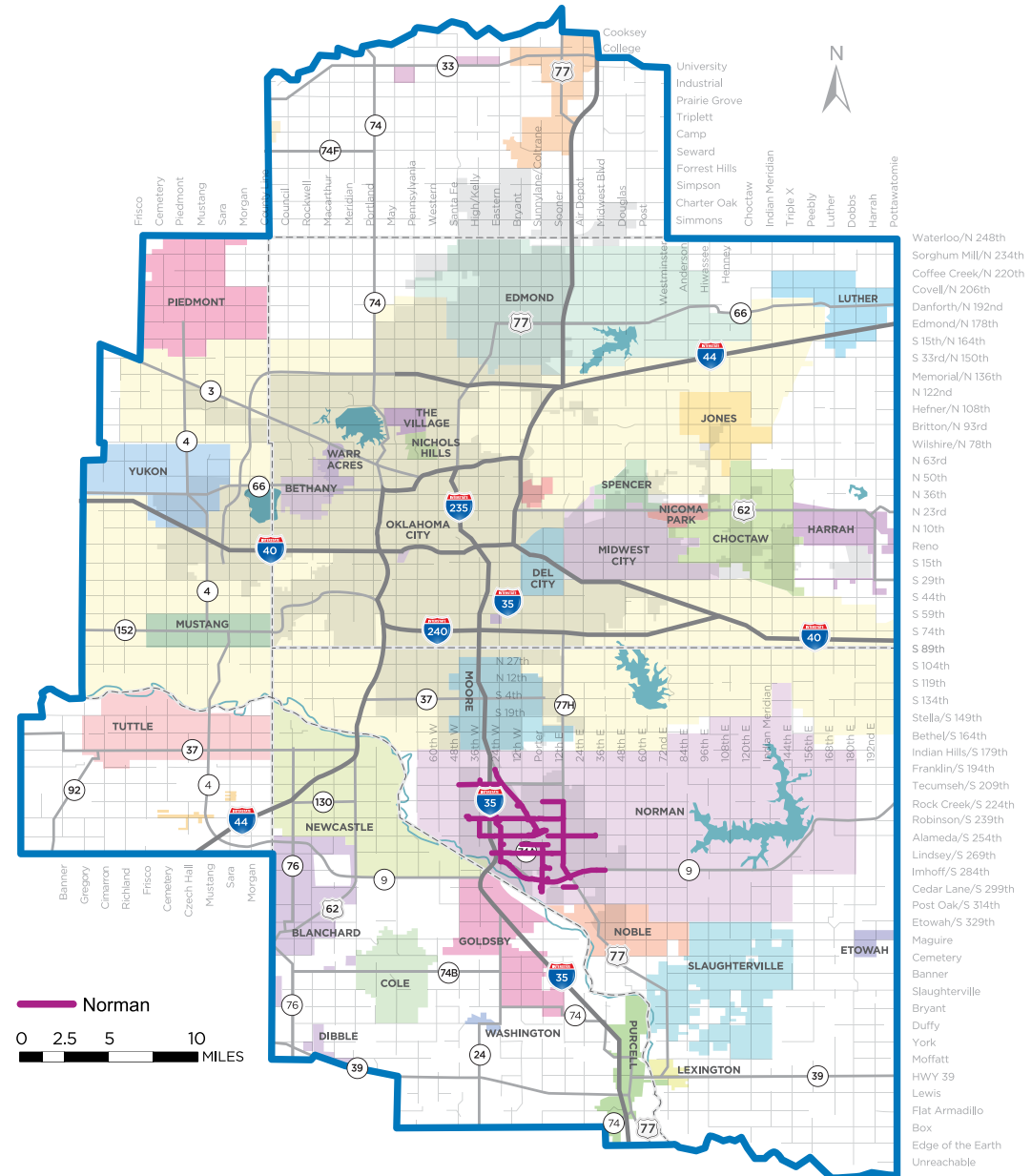
- Connected by fiber optic
- Use Leddar infrared sensors to detect cars in intersections for light timing
- Two phases of signal interconnect
  - Phase 1: 2nd Street
  - Phase 2: Broadway and Danforth



# 2016 REGIONAL UPDATE

## NORMAN

- Extensive system fiber optic connected signals
- Centrac's traffic management system
  - 90% on system (8/2016)
  - Monitor traffic incidents, improve congestion and lower emergency vehicle response times



## MTP

- [illegible]

# ENCOMPASS 2040 TRANSPORTATION ALTERNATE NETWORK ASSUMPTIONS

## ALTERNATE COMPONENTS

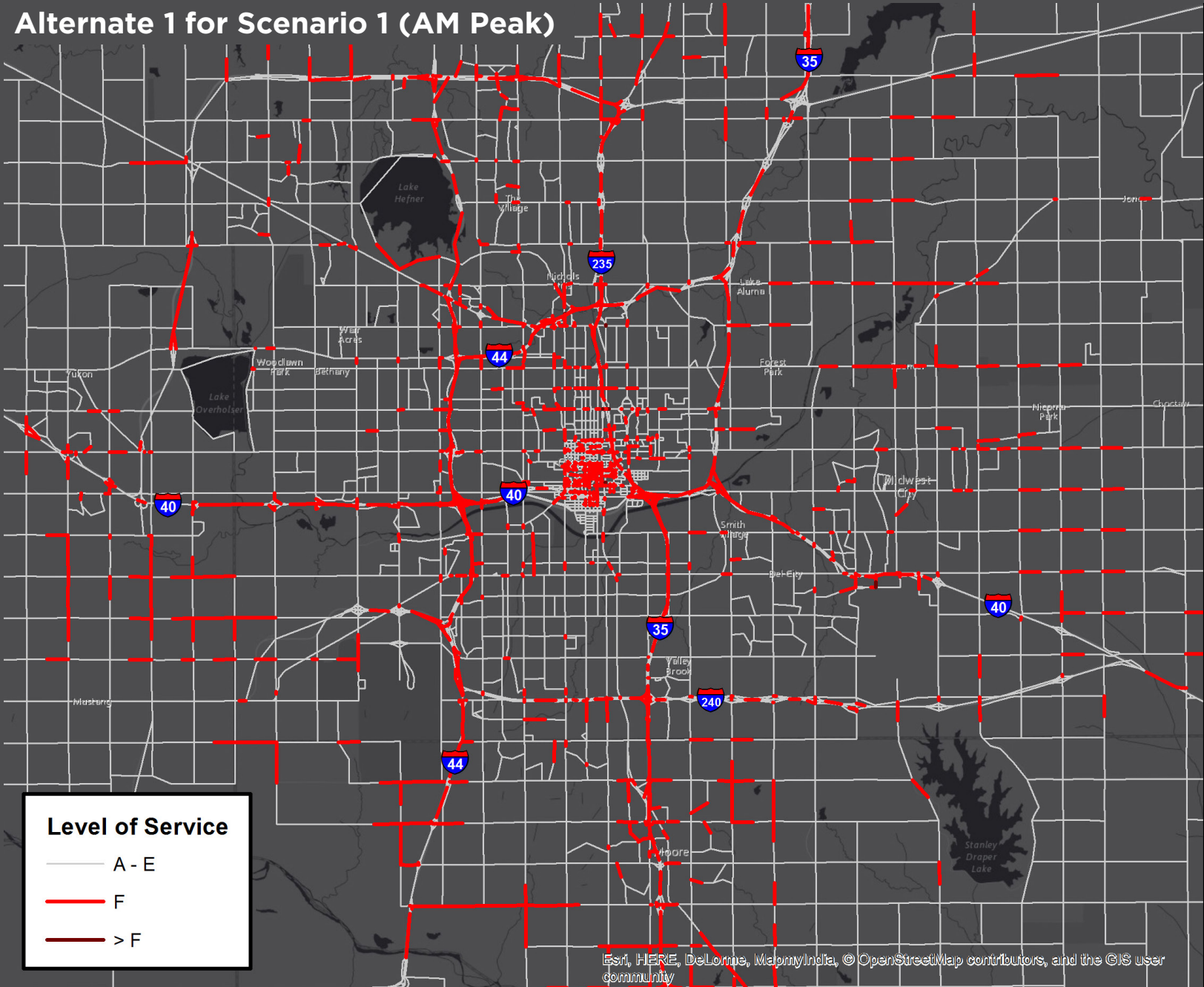
	BASE NETWORK	ALTERNATE 1	ALTERNATE 2	ALTERNATE 3
Base Street Network (2010)	✓	✓	✓	✓
Base Fixed Transit Routes (2010)	✓	✓	✓	✓
Present + Committed Projects (2010-2016)		✓	✓	✓
ODOT 8-Year Construction Work Plan (through 2016)		✓	✓	✓
Encompass 2040 Member Projects			✓	✓
Long-range ODOT Projects			✓	✓
Gap Projects (Improvements that close gaps in the network)			✓	✓
OTA Turnpikes			✓	✓
Downtown Oklahoma City Streetcar			✓	✓
ITS Integrated Corridor Management (Ramp metering and DMS)			✓	✓
ITS Adaptive Signal Control (Coordinated network of signals)			✓	✓
Signalization at Critical Locations (Stop sign conversion)			✓	✓
Regional Transit (2030 Fixed Guideway Study Vision)				✓
0.3 – 0.47% Transit Mode Share	✓	✓	✓	
1.0% Transit Mode Share				✓



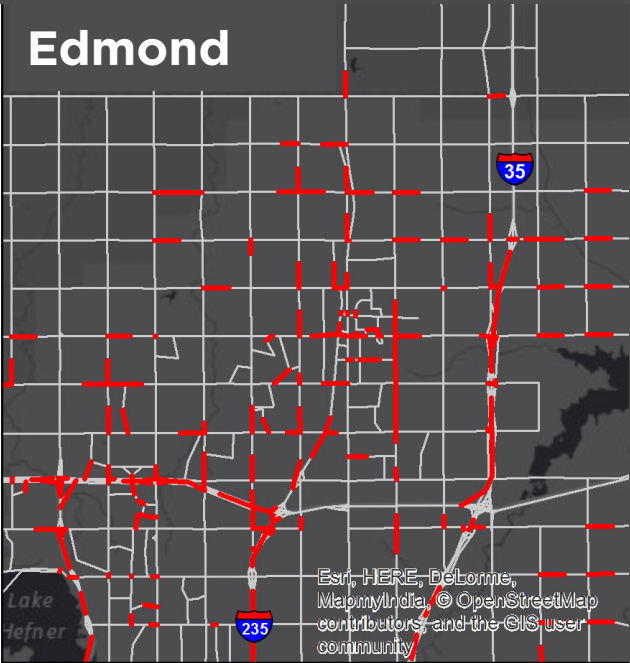
# ENCOMPASS 2040 MODEL SCENARIOS

- Integrate the ITS data into the modelling process
  - Traffic signals, signal interconnects and DMS for the 2010 values
- ITS Data Included (from 2016 update):
  - OKC
  - Edmond
  - Norman
  - ODOT
- For 2040 projections:
  - Decrease in total congestion to account for better ITS integration
  - Traffic signals added at highly congested stop signs
  - Ramp metering

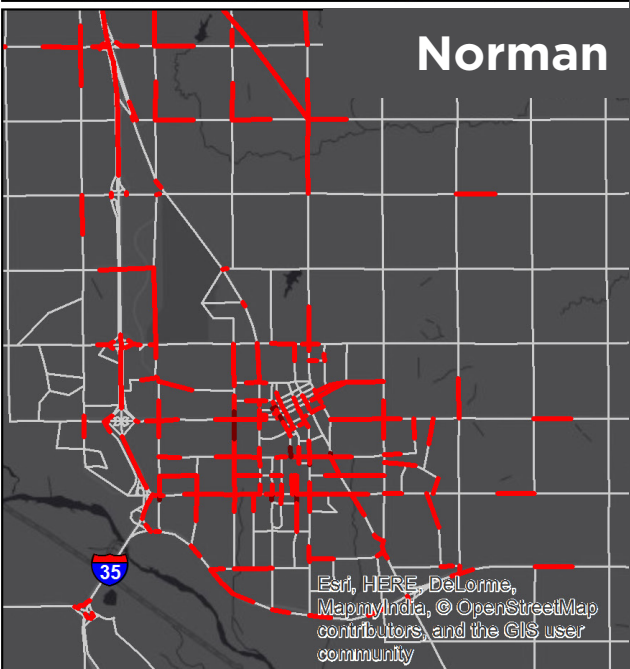
# Alternate 1 for Scenario 1 (AM Peak)



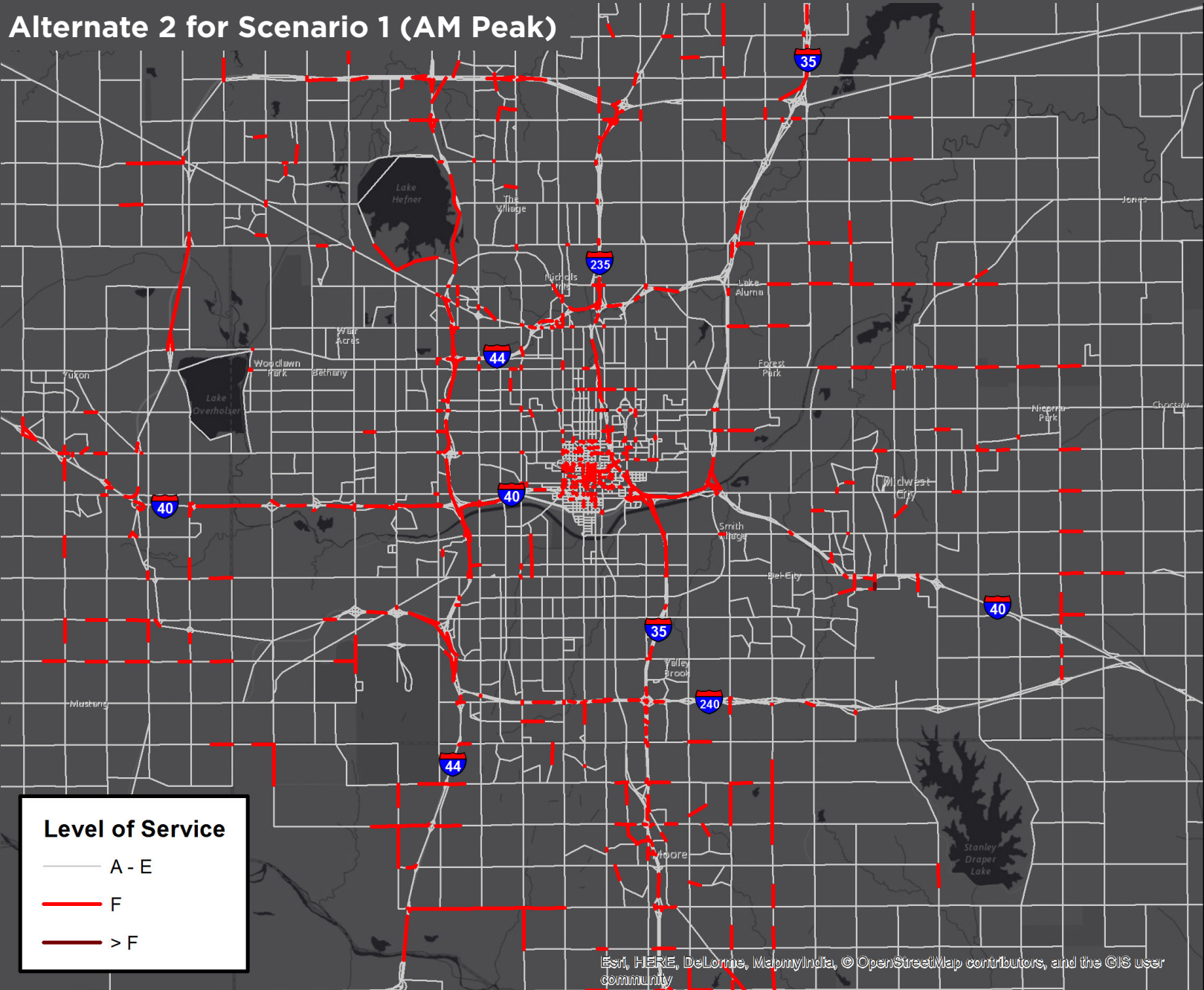
## Edmond



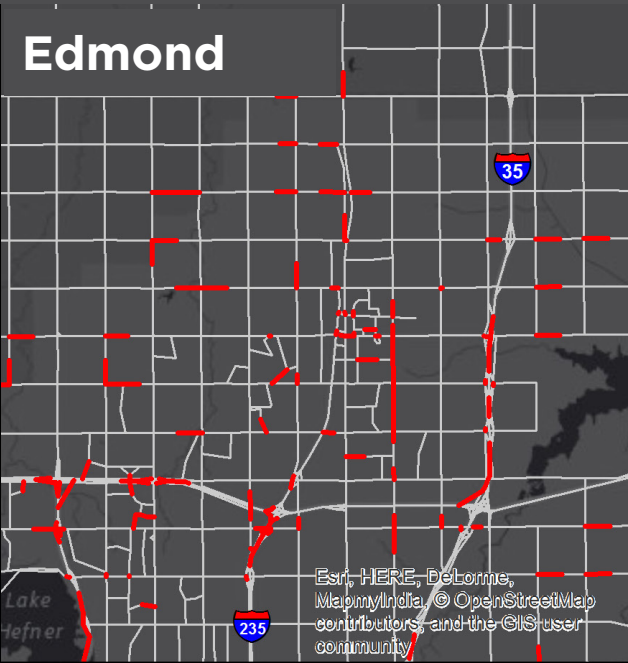
## Norman



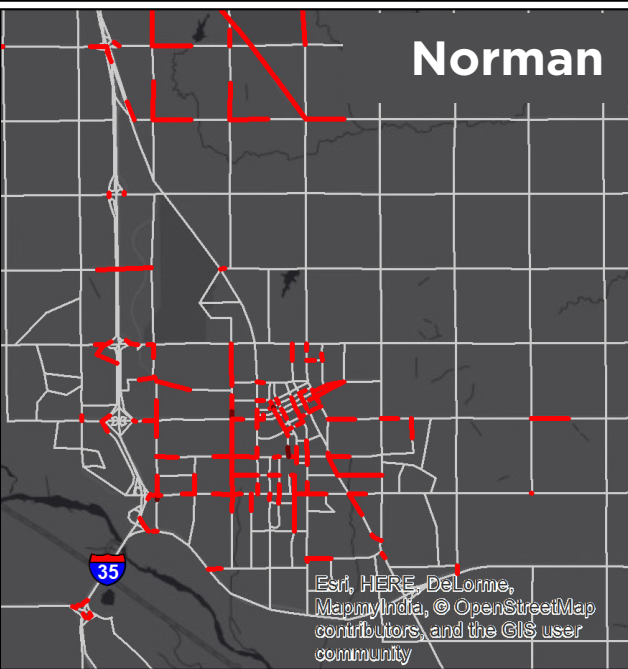
# Alternate 2 for Scenario 1 (AM Peak)



## Edmond



## Norman



# TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

- Short range 4 year federally funded program of projects
- State Highway
- ITS are considered safety projects and eligible for 100% funding
  - Eligible types: Implementation of traffic program, school zone signals, signal synchronization and priority control systems for emergency or transit vehicles at signalized intersections





# FUTURE ITS GOALS AND DATA NEEDS

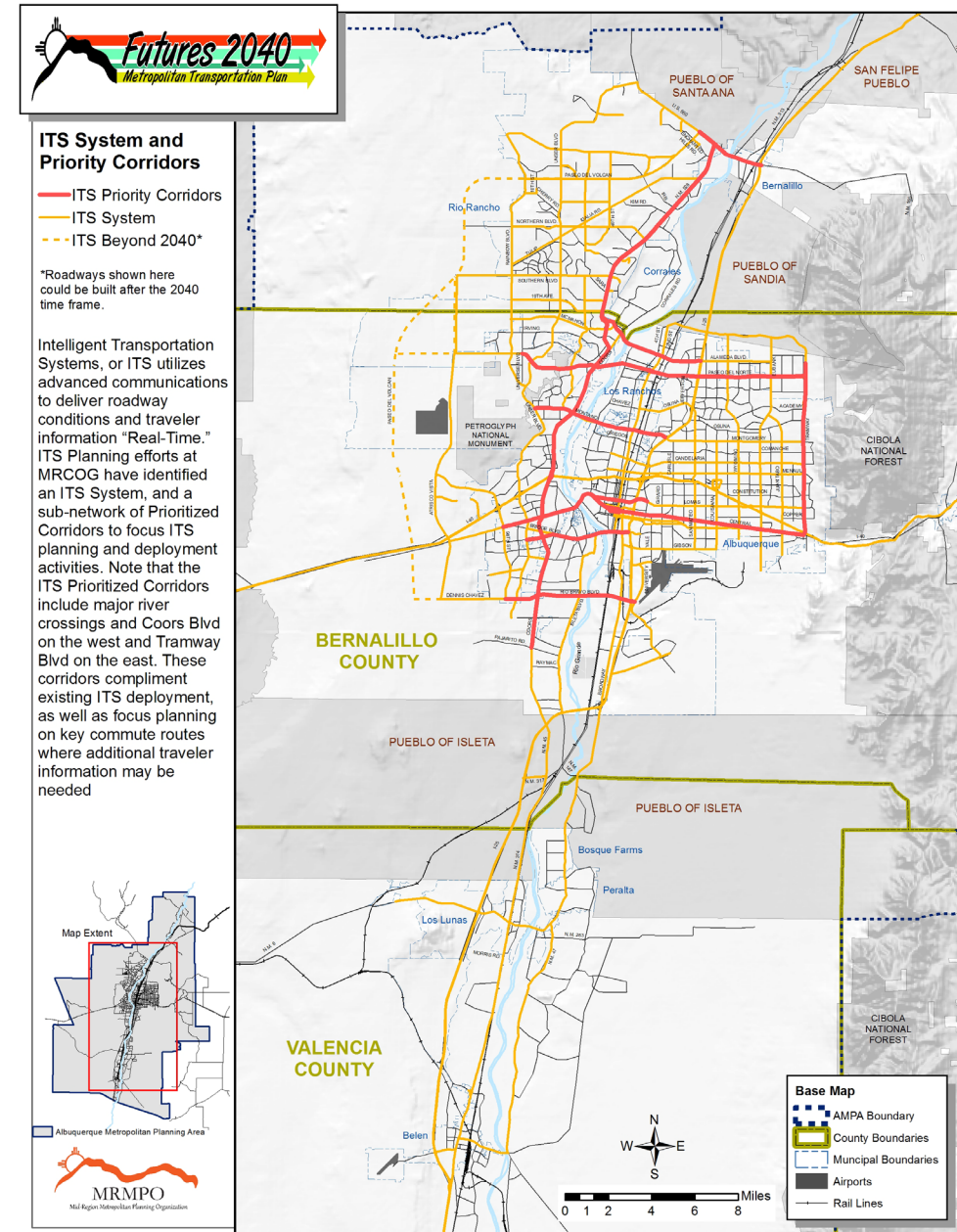
- Maintain the previous work and continual updates
- Model Updates – more up to date current and planned ITS data
  - Would like to collect more detailed information from our members
- Short range transportation plan- Project selection criteria
  - ITS priority corridors (identify from entity priorities)
  - ITS Congestion Management Strategies and ‘CMP Toolbox’ Implementation

# MID REGION METROPOLITAN PLANNING ORGANIZATION

(MRMPO)

## ALBUQUERQUE, NM

Identify and incorporate 'ITS Priority Corridors' into their long and short range plans through the project selection processes





# CONGESTION MANAGEMENT TOOLBOX

## EXAMPLES OF ITS STRATEGIES

PROJECT/PROGRAM	CONGESTION IMPACTS	COST	COMPANION STRATEGIES
<b>Communications Networks and Roadway Monitoring Coverage</b> fiber, wireless, cameras, speed detectors, etc.	Increased operational capability to monitor and respond to incidents on the network and provide traveler information	Low to moderate depending on deployment and existing network capabilities	Regional Traffic Management Center (TMC), Traffic Signal Coordination and Modernization, Traffic Incident Management (TIM) Program, Transit Programs
<b>Regional Traffic Management Center</b>	Reduction in incident response time, Reduced delay due to incidents, Increased travel time reliability	Low to moderate depending on deployment. If office space exists a TMC can be as small as a workstation with a computer and multiple monitors. TMCs can also be stand-alone structures with video walls	Traffic Incident Management, Communications Networks and Roadway, Monitoring Enhanced Enforcement, Traffic Signal Coordination and Modernization, Managed Lanes
<b>Traffic Signal Coordination and Modernization</b>	Reduced VHT, Reduced intersection delay Increased travel time reliability, Improved travel time	Moderate capital cost for upgrades of signals, controllers, and communications network. Ongoing staffing cost for traffic engineers if expansion in staff is needed	Regional Traffic Management Center, Traffic Incident Management Program
<b>Work Zone Management</b> ITS, Smart Work Zones	Increased travel time reliability, Reduced VHT, Reduction in work zone related incidents	Low capital cost for purchase of mobile DMS signs, Ongoing staffing cost depending on deployment	Traffic Incident Management, Enhanced Enforcement
<b>Bicycle and Pedestrian Intersection Enhancements</b> video, infrared, radar, and/or magnetic detection an visual and/or auditory	Increased mobility and access, Increased use of alternative modes, Increased bicycle/pedestrian safety	Low to moderate depending on scale of deployment	Traffic Signal Coordination and Modernization, Communications Networks and Roadway Monitoring
<b>Ramp Metering</b>	Reduced VHT, Increased travel time reliability	Low to moderate capital costs for new signals on existing ramps, Low capital costs for ramp widening where necessary	Traffic Incident Management, Traffic Signal Coordination and Modernization
<b>Speed Harmonization</b> Variable speed limits	Reduced VHT, Reduction in traffic incidents	Low to moderate capital cost for ITS deployment for speed detection and variable speed limit signage	Regional Traffic Management Center, Traffic Incident Management Program Enhanced Enforcement, Communications Networks and Roadway Monitoring
<b>Traveler Information Systems</b> Incident, congestion, and weather related	Increased travel time reliability, Reduction in work zone related incidents, Reduced delay due to incidents	Low to moderate depending on existing communications network and device deployment	Traffic Incident Management Program, Regional Traffic Management Center, Enhanced Enforcement



# QUESTIONS?

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