Regional Traffic Management Center Symposium

February 11, 2016

What is a Traffic Management Center (TMC)?

- By definition:
  - A center that manages a transportation network
- People have different conceptions of…
  - Center - building, computers, people?
  - Manage – control devices, directing/informing users?
  - Transportation – rail, maritime, fleets, roadways?
- Short answer…

YES

The Long Answer

- To understand Regional Traffic Management, you need to understand…
  - Intelligent Transportation Systems (ITS)
  - TSM&O

Making the Case

- Growing travel demand
- Regular congestion on key routes
- Special events
- Construction getting more expensive
- Technology more ingrained in our lives

What is an Intelligent Transportation System (ITS)?

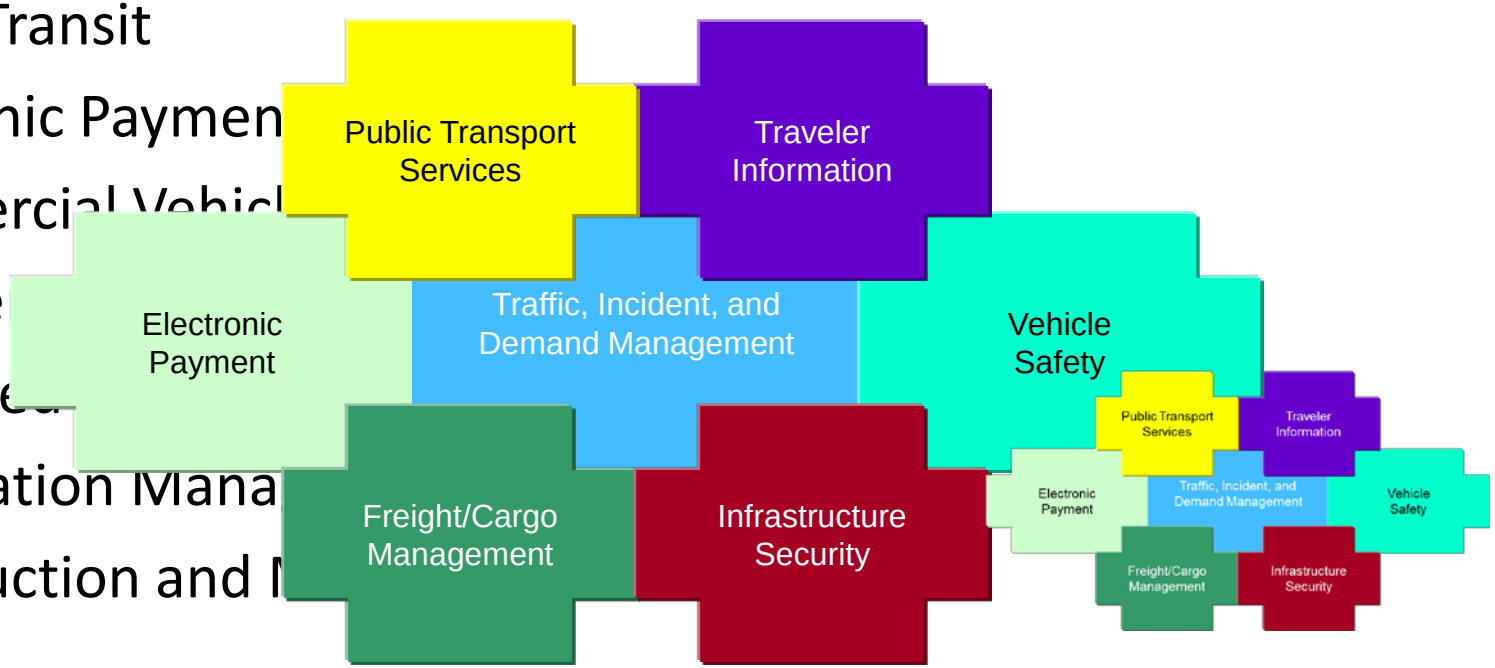
- Intelligent – Adaptive traffic optimization using latest computer, electronic and communications technology
- Transportation – Road traffic related, but can include shipping and rail
- System – Combination of electronic equipment on street and communication to central computer systems

What ITS Is (and Isn't)

- ITS uses advanced technologies to improve the efficiency and safety of travel
- ITS is about integration (The whole is greater than the sum of the parts)
- ITS in itself does not solve transportation problems without complementary management and operations activities (TSM&O)
- ITS is an often misused term

Pieces of the Puzzle – User Services

- Travel and Traffic Management
- Public Transit
- Electronic Paymen
- Commercial Vehicl
- Emerge
- Advance
- Information Mana
- Construction and M



The Three Major Elements of an ITS System

Field - Communications - Traffic Management Center

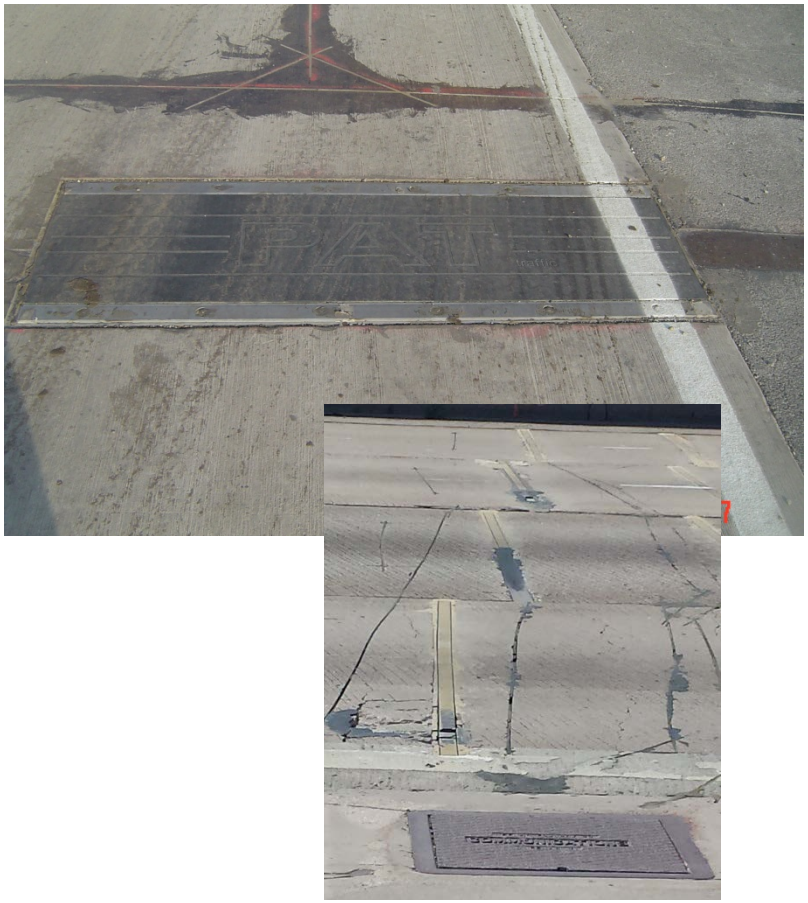
FIELD – Vehicle Sensors

- In Pavement
  - Inductive Loop
  - Magnetometers
  - Inductive Coils
- Overhead
  - Ultrasonic
  - Microwave
  - Acoustic
  - CCTV

Field – Weigh-in-Motion

- In-pavement scales
  - Bending Plate
  - Piezo Quartz

- Accurate at high speeds
- Enhance enforcement and **protect the road**

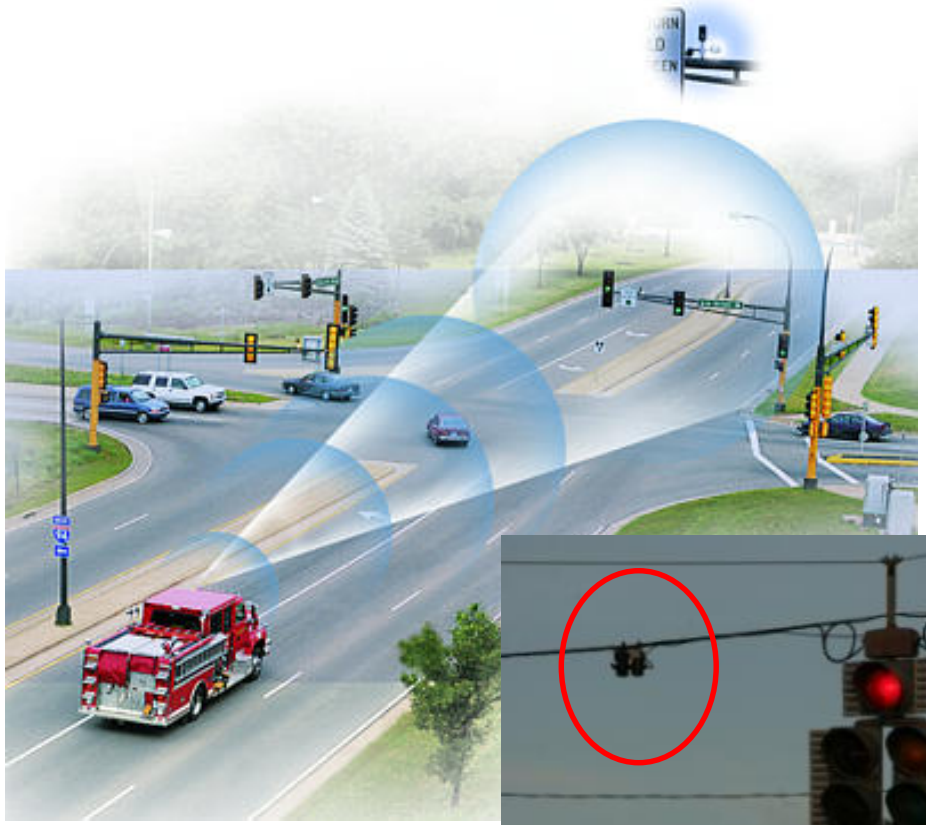


FIELD – Camera sensors and CCTV Security

- CCTV Surveillance (PTZ)
- Video Image Processing
  - Stop Line Camera

FIELD – Lane Speed Control Signs (LSCS) and Dynamic Message Signs (DMS)

Field – Vehicle Preemption, Adaptive Signal System

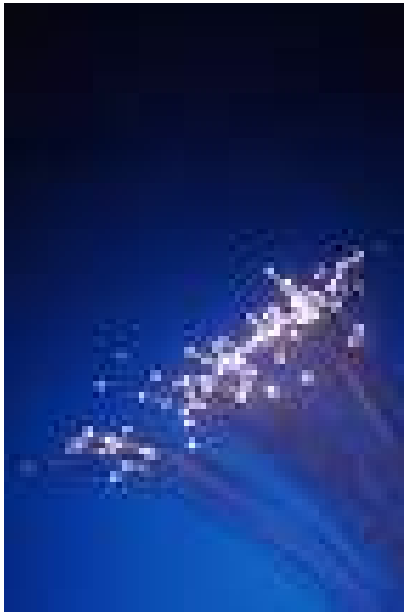


Field –Weather Sensors

- Fog and Smoke
- Sand and dust storms
- Freezing Temperature
- Snow and ice
- Heavy rain
- High wind

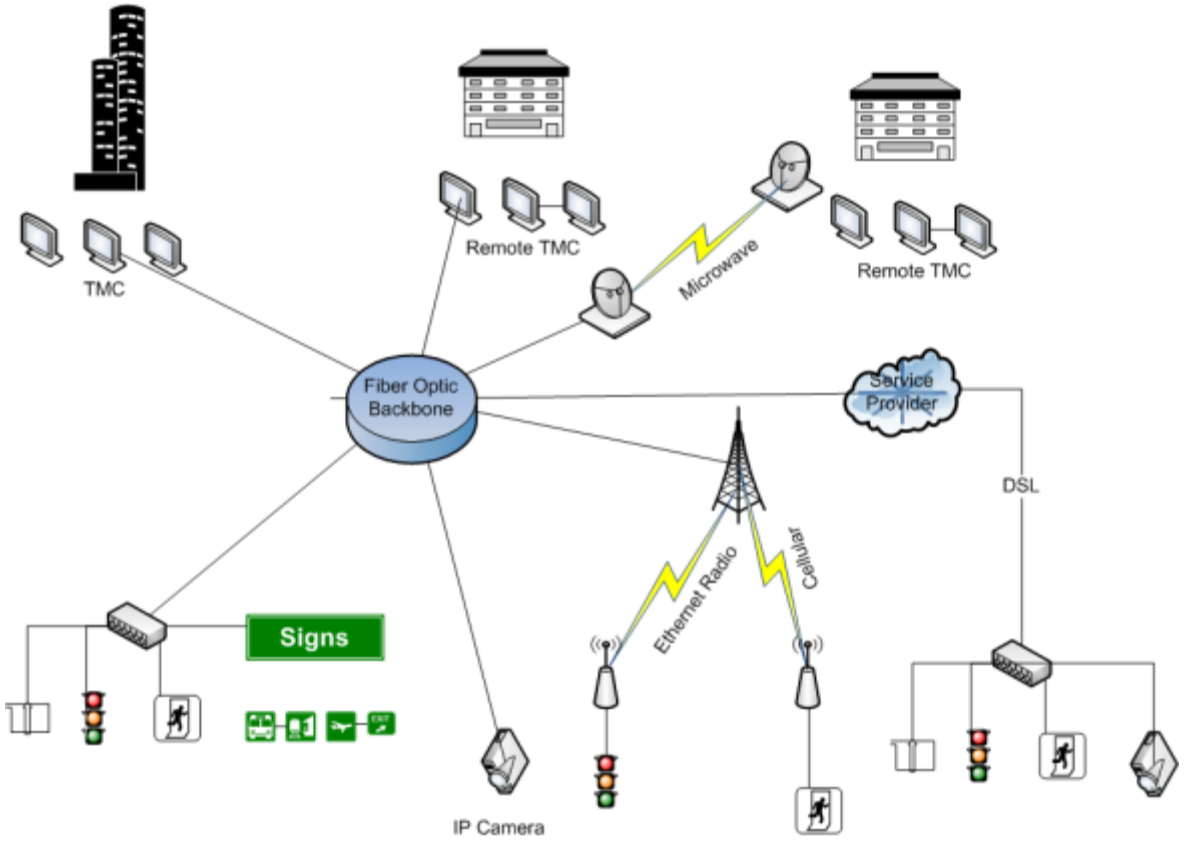
Communications: The Missing Link

- Requires a mix of low and high bandwidth channels
- Harsh outdoor environments
- Also includes power, duct bank and buried cables (Electrical group expertise)



Communications Link the Field with Traffic Management Center and Remote Locations

- Fiber
- TelCo provided bandwidth
- Cellular data
- Ethernet radio
- High bandwidth microwave links



Traffic Management Center TMC

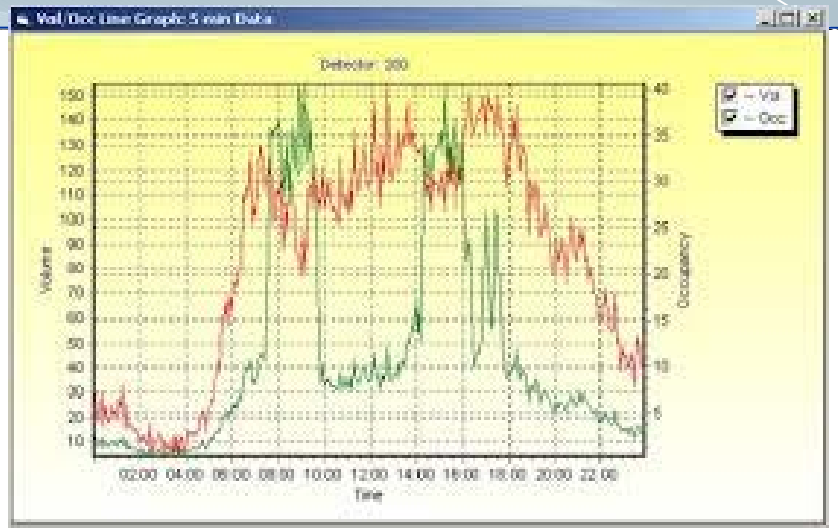
- Various levels of complexity, automation, integration
- Integrated management software
- Centralized monitoring and control of all elements
  - Video distribution and control
  - DMS messaging
- Data processing
  - Incident detection
  - Travel time calculation
- Data archiving

Advanced Traveler Information Systems

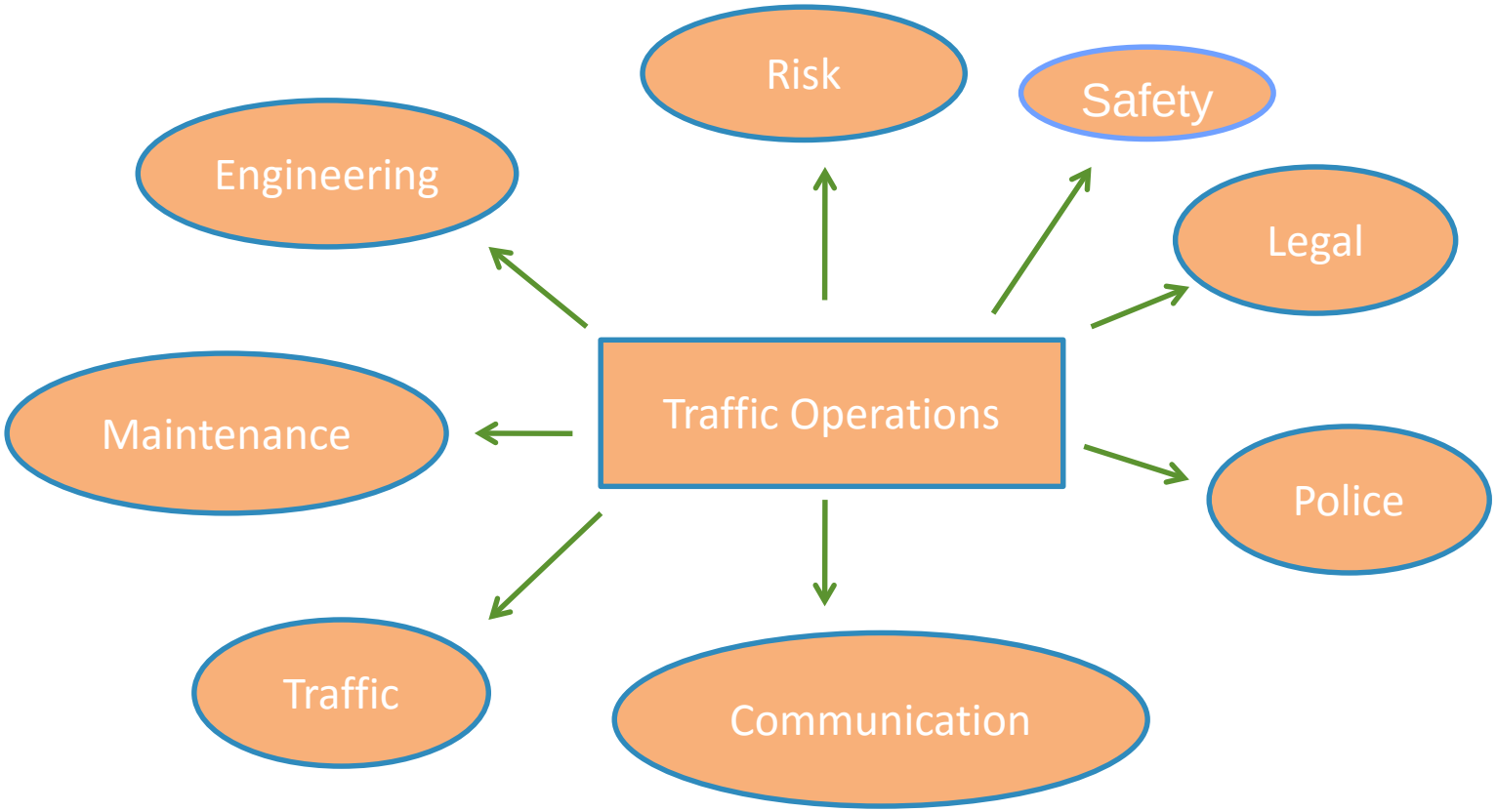
- AM Radio
- Cell phone 511
- Apps
- Television
- Internet

Data Archive

- Era of big data
- Organizational performance measures
- Several states creating new multi-jurisdictional archives with easy interface
- Some private data archives

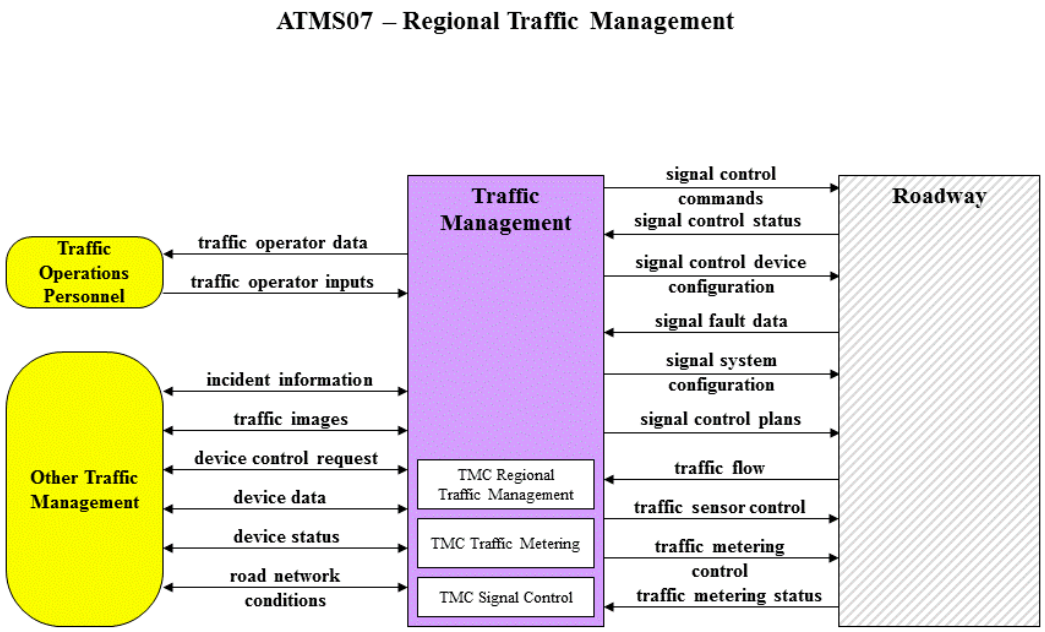


TMC Exists Within an Organization



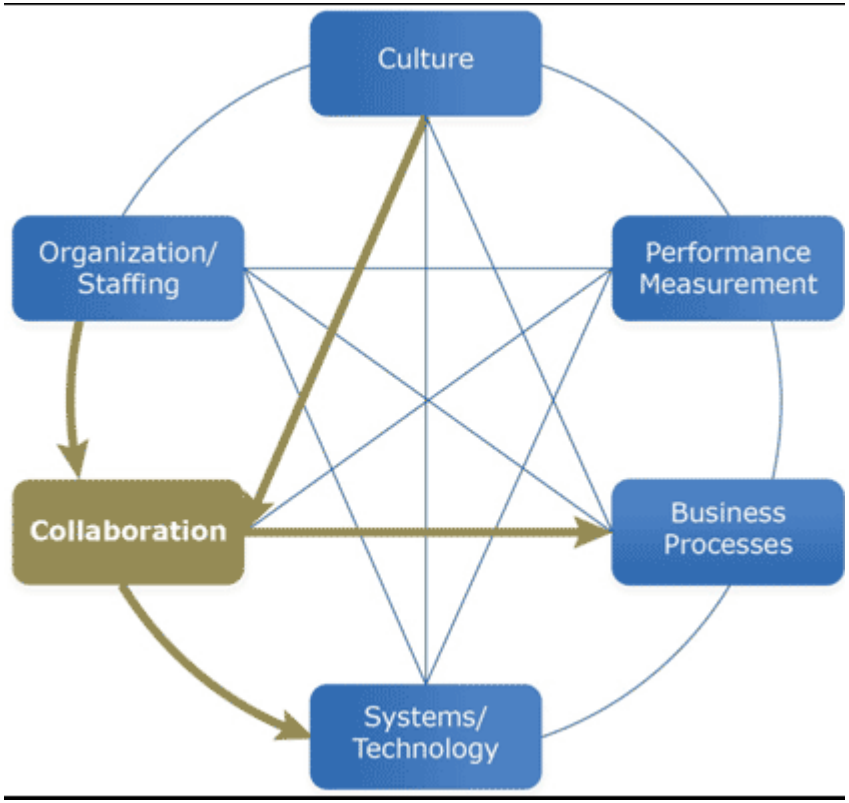
TMC Within a Region

- Whole is greater than the sum of the parts
- Integrated Corridor Management
  - Transit
  - Signals
  - Freeways
- Travelers don't recognize jurisdictional boundaries
- TSM&O



Transportation System Management & Operations

- Used by FHWA
- Focus on operations
  - Getting most of existing infrastructure
  - By using technology (ITS)
  - By collaborating
  - By focusing on performance
- Requires management



FHWA – Improving Transportation System Management and Operations Whitepaper

Chatham County Intelligent Transportation System and Traffic Control Center Strategic Plan

- **Phase 1**
  - Inventory
  - Needs
  - Tours
- **Phase II**
  - Goals and Objectives
  - Traffic Management Options
  - Regional Traffic Management
  - Strategic Plan

Existing Systems and Infrastructure Needs

A. Existing Systems and Needs

- **Study Region: Chatham, Effingham, and Bryan Counties**
- **Agencies that own/maintain traffic signals in region:**
  - **City of Savannah**
  - **GDOT**
  - **Chatham County**
  - **City of Pooler**
- **Goal of Inventory:**
  - **Determine the state of the existing traffic signal systems, traffic control devices, and Intelligent Transportation Systems (ITS) devices**

Summary of Phase 1 Activities and Findings

A. Existing Systems and Needs

- **Infrastructure Needs**
  - ❖ **Communication**
    - o City of Savannah - more capacity fiber (single mode)
    - o GDOT – 35% signals have no communications
    - o Chatham County – 96% have no communications
    - o Pooler – cannot communicate with signals (but has fiber to most)
  - ❖ **Controller and Cabinet Upgrades**
    - o GDOT/City of Pooler – No upgrades needed
    - o Savannah – 10% need upgrading to 2070s + 332/336 Cabs
    - o Chatham County - 33% need upgrading to 2070s + 332/336 Cabs

Summary of Phase 1 Activities and Findings

A. Existing Systems and Needs

- **Infrastructure Needs (continued)**
  - ❖ **ITS Field Devices (All Agencies) :**
    - o **CCTV Cameras**
    - o **DMS (fixed and portable)**
    - o **System Detection**
      - ➢ **Adaptive Control**
      - ➢ **Video detection**

- **What could pull all this together?**

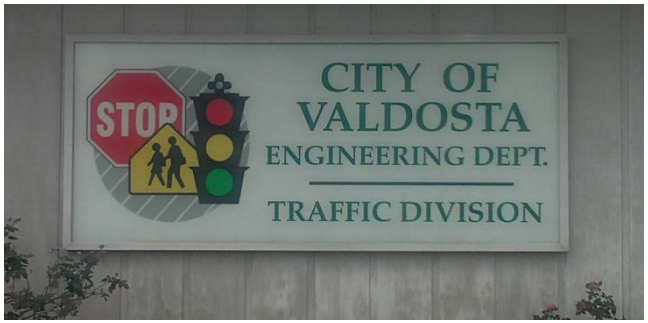
  TRAFFIC MANAGEMENT CENTER

Phase 1 Scan Tours

B. Lessons Learned from Scan Tours

- **Jacksonville Regional TMC**

- **City of Valdosta**



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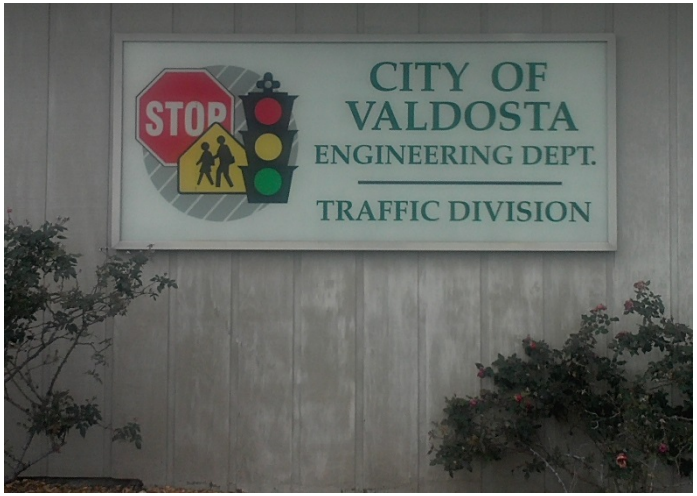

- City of Valdosta
  - 127 Signals
  - 117 can be communicated with from TMC
  - 26 CCTV cameras (surveillance)
  - 100% 2070 controllers
- City spent $1.4 million on TMC
- GDOT paid $350,000 for fiber (10 years ago)

Alternatives Evaluation and Implementation Plan Phase II

- Task 1 – Goals and Objectives – long range aspirations for mobility and traffic management in the region
- Task 2 – Traffic Management Improvement Options – to meet short, medium and long term needs
- Task 3 – Regional Traffic Management – building on tours, making the case for regional traffic management through case studies
- Task 4 – Preparation of the Strategic Plan – responsibilities, costs, funding, etc.
- Task 5 – Implementing the Strategic Plan – first steps (optional)