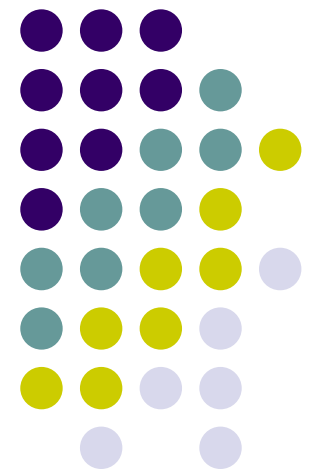


# City of Chicago ITS Initiatives

David Zavattero  
City of Chicago OEMC

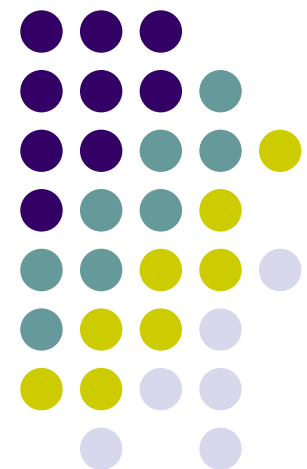
Traffic Management EXPO 2007  
November 7-8, 2007



# Developing and Deploying the Chicago Traffic Management Center

David Zavattero  
City of Chicago OEMC

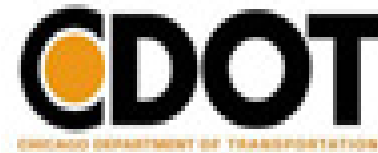
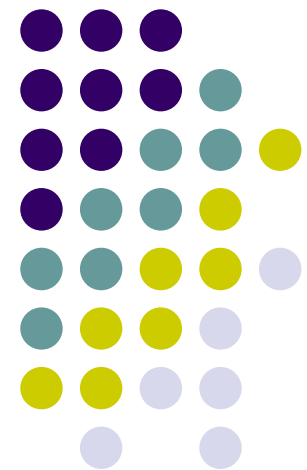
56<sup>th</sup> Annual Illinois Traffic Engineering &  
Safety Conference  
October 18-19, 2007





# Chicago Traffic Management Center Phase 2

**Kick-Off Meeting**  
**Wednesday, November 14, 2007**





## Some questions

- **Why a TMC?**
- **What will a TMC do?**
- **What's done so far?**
  - **Existing systems**
  - **Related projects**
- **What's next?**

# An Overview



- **Signal systems**
- **Traveler information**
- **Transit and traffic management**
- **Database development & integration**

- **Traffic Management Center**

# Providing Traveler Information

## Creating Public/Private Partnerships



## Making Transit More Effective



## Reducing Traffic Congestion



## Supporting Homeland Security



## Resolving Truck Transport Issues



## Managing Incidents



## Promoting Interagency Cooperation



## Interagency Communications



## Integrating Traffic Management Centers

# 10 Recommendations



- 1) **Adopt/adapt existing technologies**
- 2) **Pursue multi-disciplinary approaches**
- 3) **Create operational roadmap with stakeholders**
- 4) **Use diversified acquisition strategy, open standards**
- 5) **Work closely with technology providers**
- 6) **Emphasize capabilities for routine operations**
- 7) **Employ metrics for cost/benefit decisions**
- 8) **Perform independent assessments**
- 9) **Develop cadre of people with expertise**
- 10) **Sustain an integrated network of centers**



**Interesting source of these recommendations:**

**Improving Disaster Management: The Role of IT in Mitigation, Preparedness, Response and Recovery**

**Adapted from:**

**Draft report prepared by NSF for OMB and FEMA in response to Sec. 214 of the “E-Government Act of 2002”**





# TMC Development Themes

- **Information Management and Communications**
  - Wired and wireless communications
  - Data sharing and mining
  - Dealing with uncertain information
- **Software Tools and Services**
  - Open architecture, standards-based
  - Computer vision, sensor fusion, prediction, modeling, real-time negotiation
- **Human Factors**
  - Interfaces, privacy, institutional issues

# Use System Engineering Process



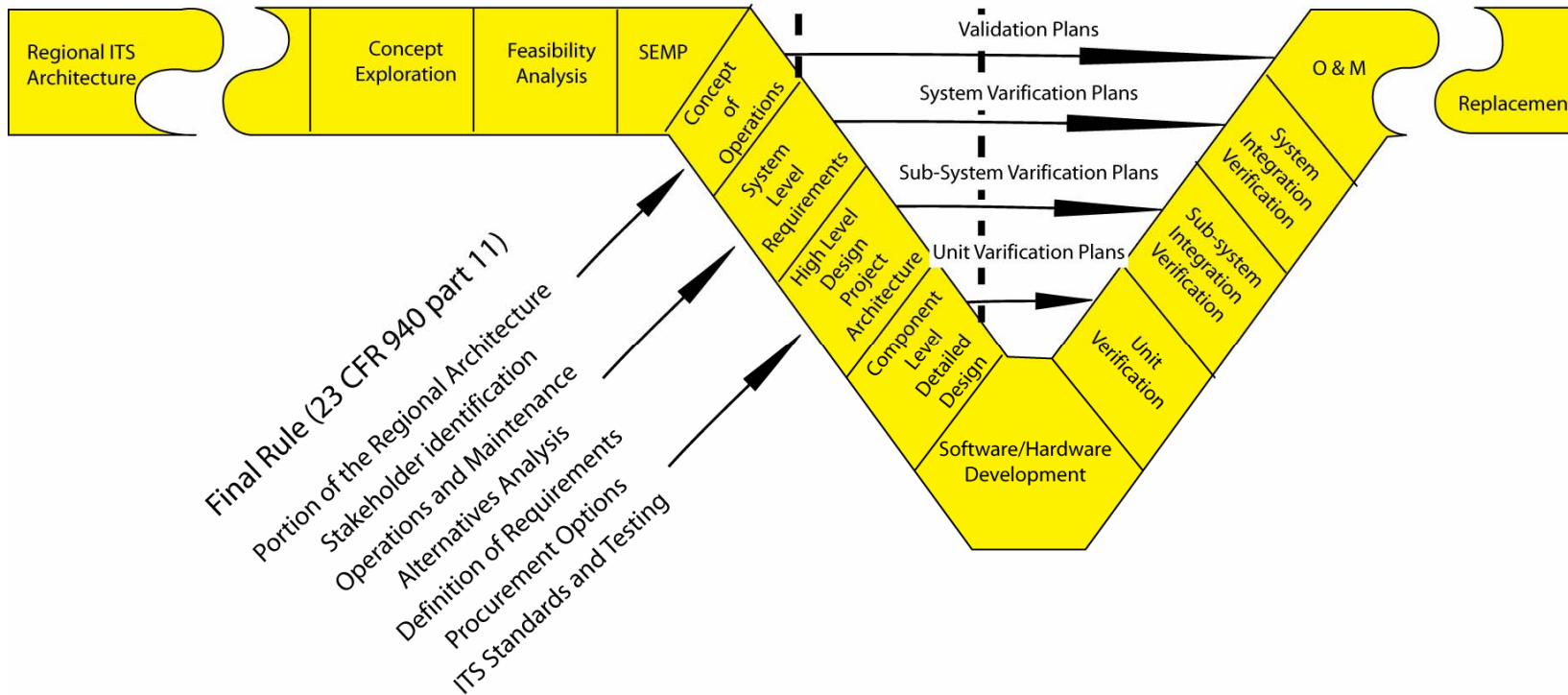
## Capitol project development lifecycle tasks

Transportation Planning	Identify Project Needs	Project Initial Doc	Form Proj Dev Team	Prepare Project Study	Secure Project Program	Prepare Draft Report	Perform Environ Report	Secure Project Approval	PS&E Development Approval	Complete Project Design	Prepare & Advertise Project	Construct Project	Project Close-out	Operations and Maintenance	Rehab
	Identify Project*		Secure Project Program*		Perform Environmental*										

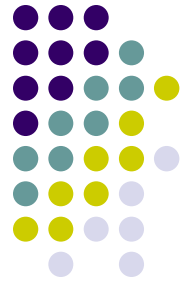
\* Applies to local agencies only

## ITS Project phase definitions

Architecture Development	Concept Exploration and Feasibility Assessment	Project Planning and Concept of Operations	System Definition	System Development and Integration and initial deployment	Operations and Maintenance	System Retirement Replacement
<b>Phase -1</b>	<b>Phase 0</b>	<b>Phase 1</b>	<b>Phase 2</b>	<b>Phase 3</b>	<b>Phase 4</b>	<b>Phase 5</b>



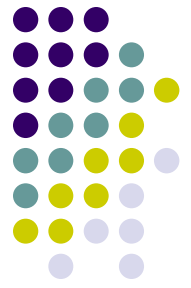
# Completed TMC Concept of Operations, Architecture, and Project Development Report



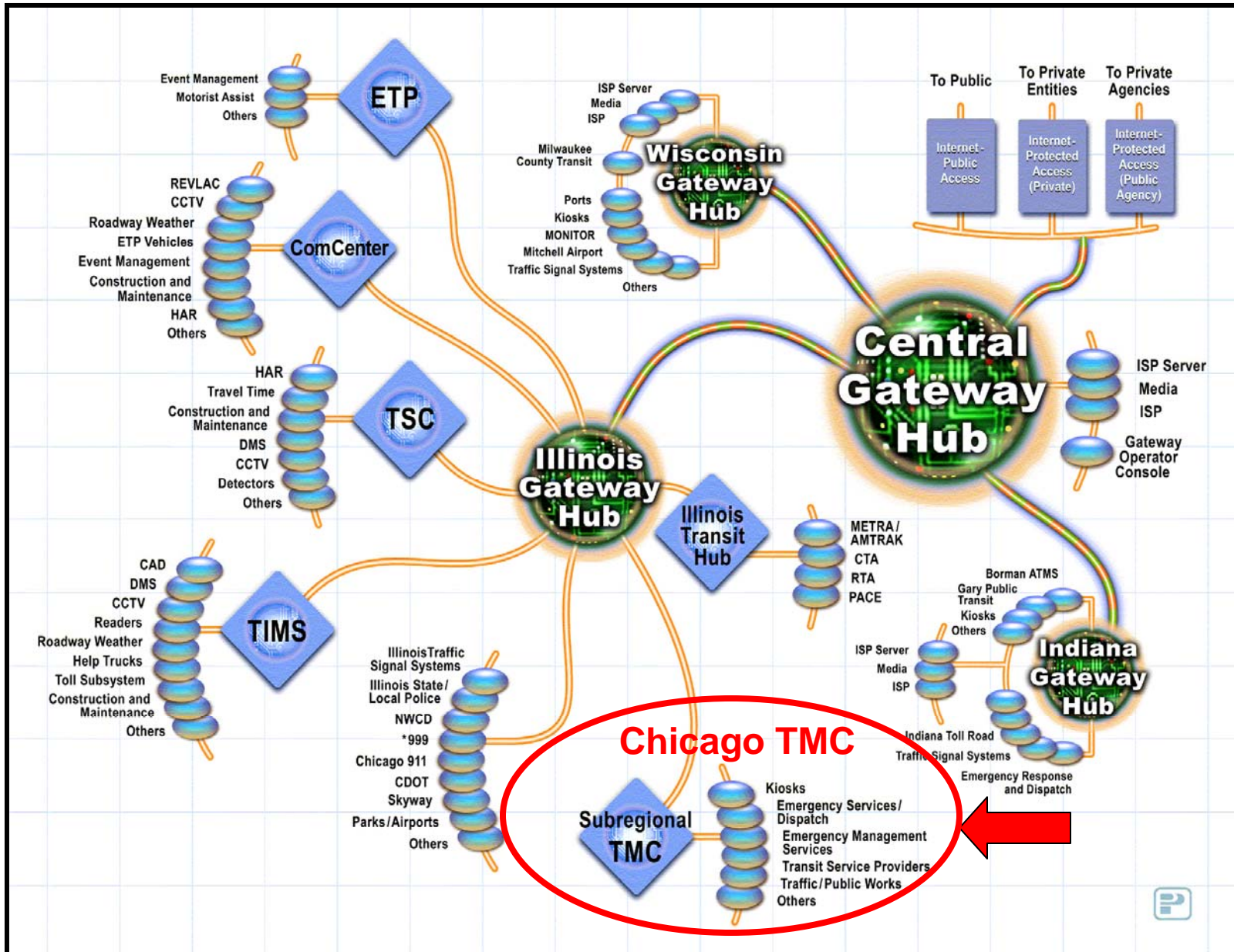
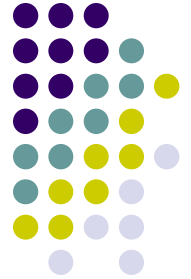
- **Defined roles and responsibilities**  
**WHAT** will be done  
**WHO** will do it  
**But not HOW** it will be done
- **Established the core requirements**
- **Provides framework project architecture**

# ... build on existing regional integration

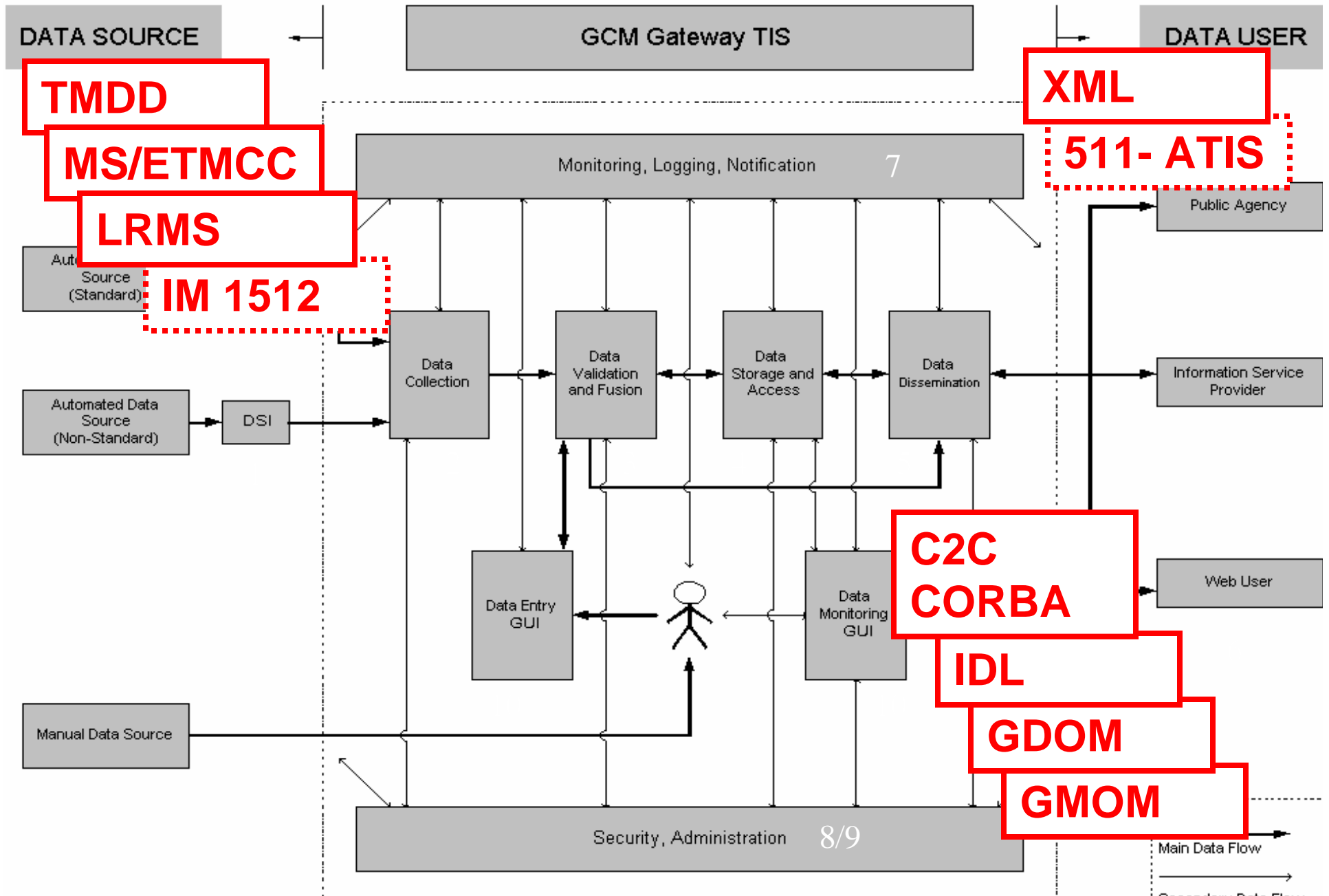




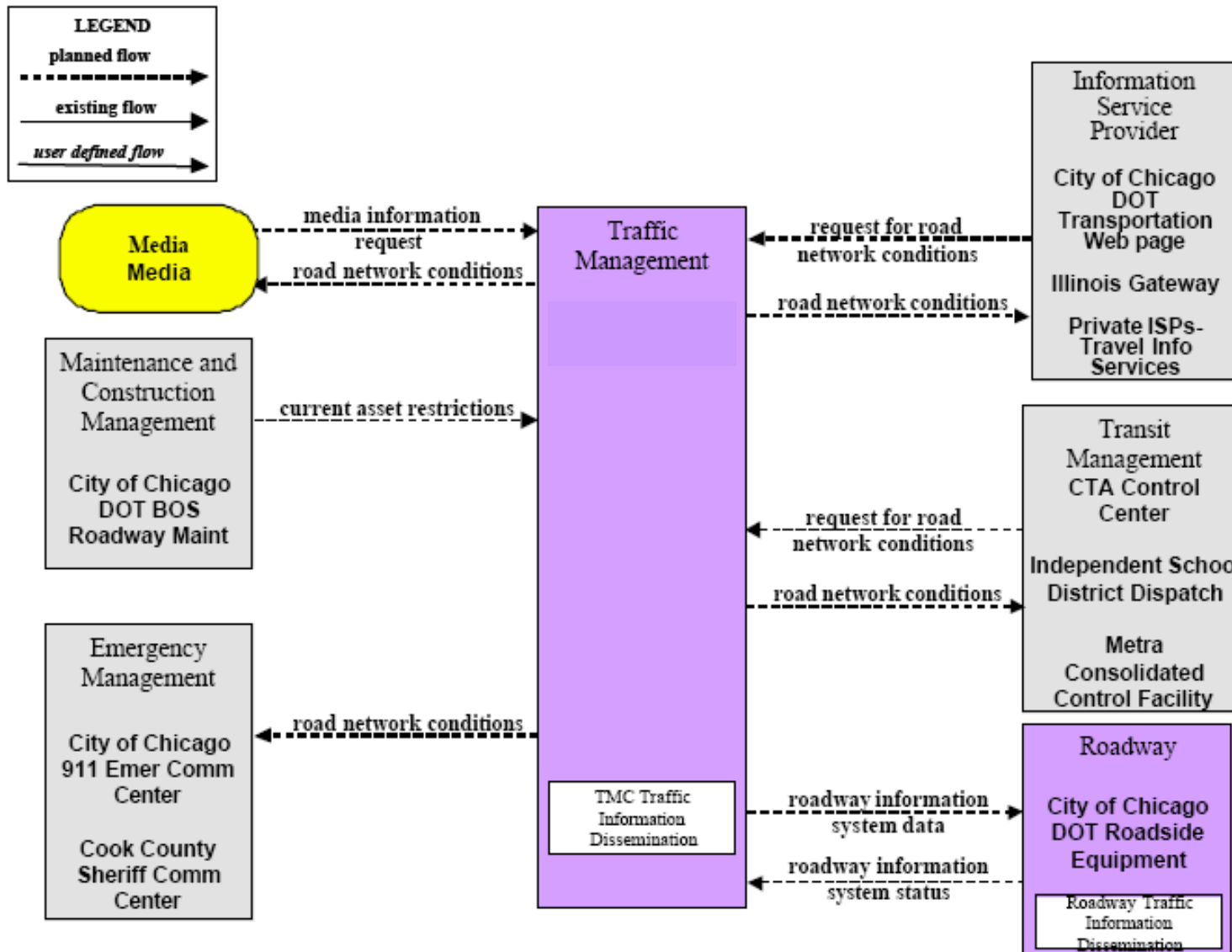
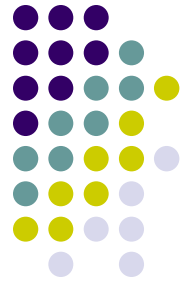
# ... use the NE Illinois Regional Architecture



# ... apply available standards



# Chicago TMC Info Flows

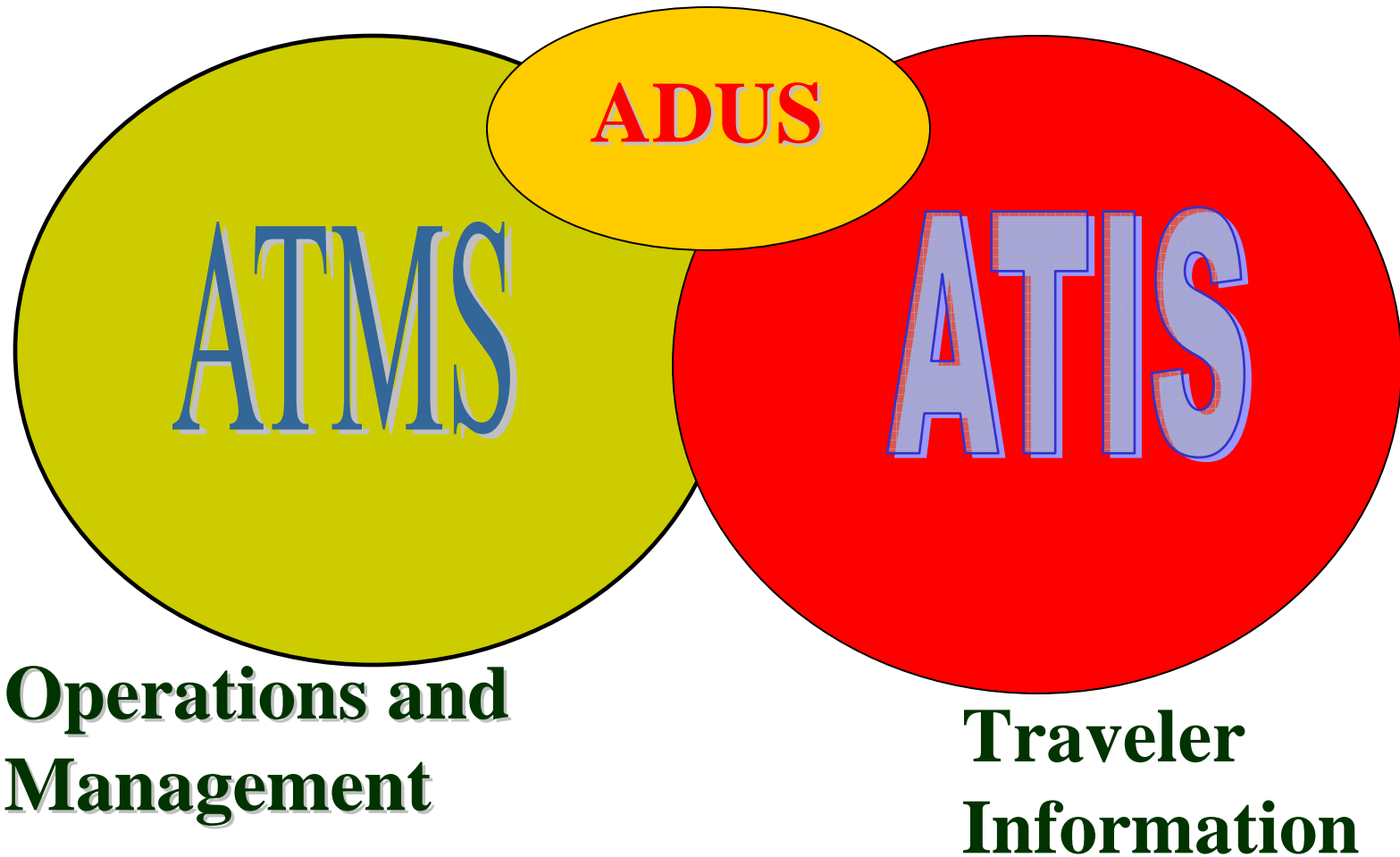




... share data



## Planning and Research





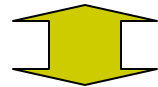
# Many ITS Tools in Chicago

- **Traffic responsive, adaptive signal systems**
- **Video detection, surveillance systems**
- **Signal pre-emption, priority systems**
- **Computer Aided Dispatch (CAD) systems**
- **Traveler information systems**
- **Vehicle navigation, tracking systems**
- **Enforcement systems - cameras**
- **Safety systems – traffic calming devices**
- **Permit, Towing, Snow Command systems and services**



# Signal System Tools

- Time-based Coordination
- Closed Loop Interconnects (CLMATs)
- Centralized Signal Control (MIST)
- Responsive Signal Control
- Adaptive Signal Control (RT Tracs pilot)

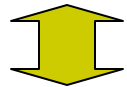


- City-wide signal optimization program
- Smart corridors
- Response plans
- Central control



# Video System Tools

- Video Detection
- Video Surveillance



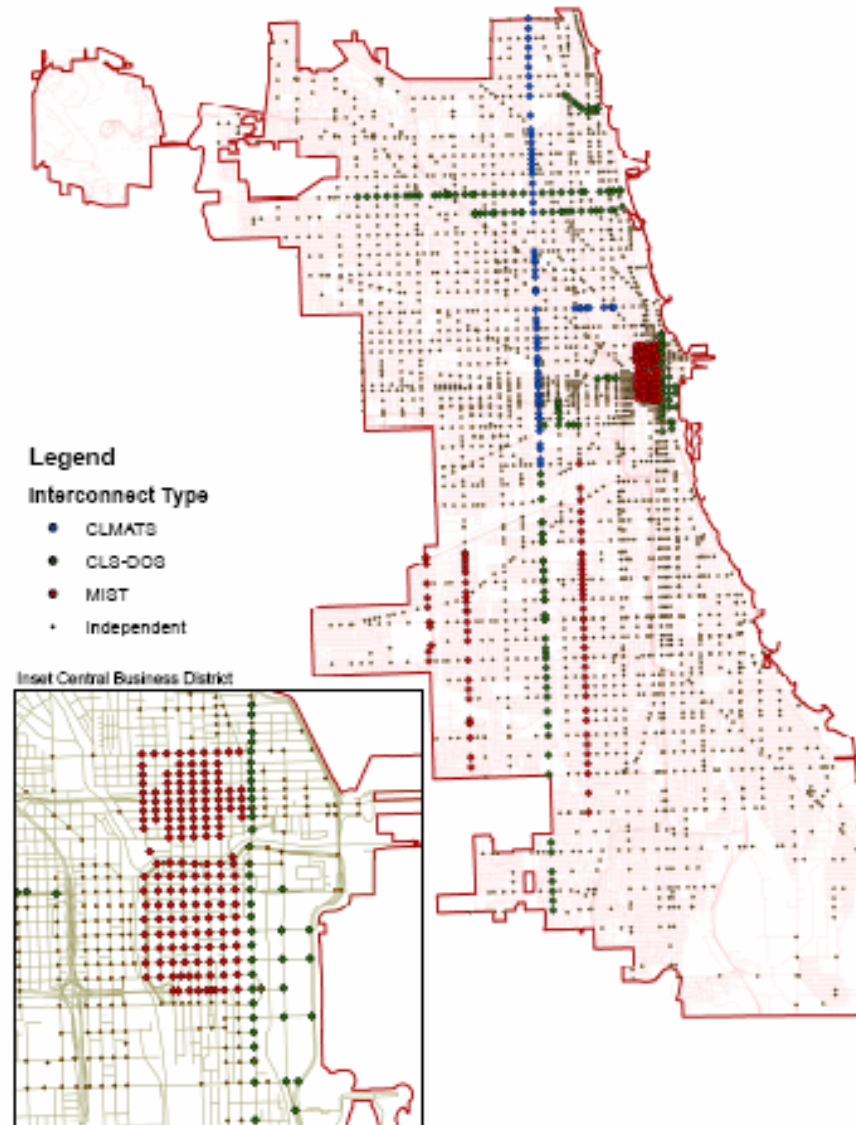
- Multiple video systems
- High-bandwidth communications backbone
- Shared use of cameras



# Chicago Signal Systems in place:

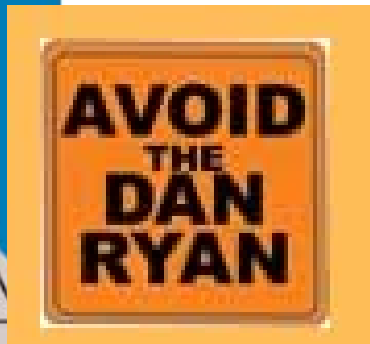
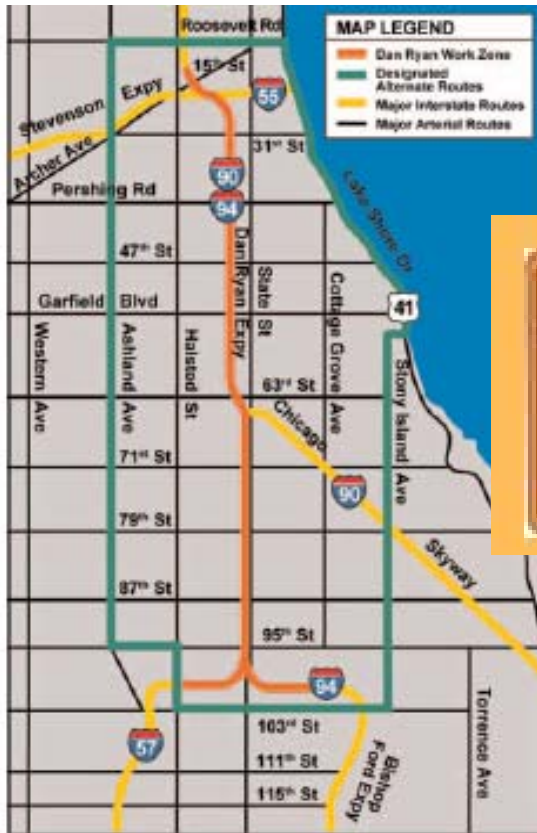
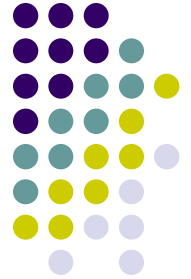
- ➔ **Over 26,000 intersections**
- ➔ **Over 2,900 Signals**
- ➔ **476 intersections interconnected in 25 systems**
  - **MIST (6)**
  - **CLMATS (19)**

City of Chicago Signal Interconnect



# Video Detection & Surveillance





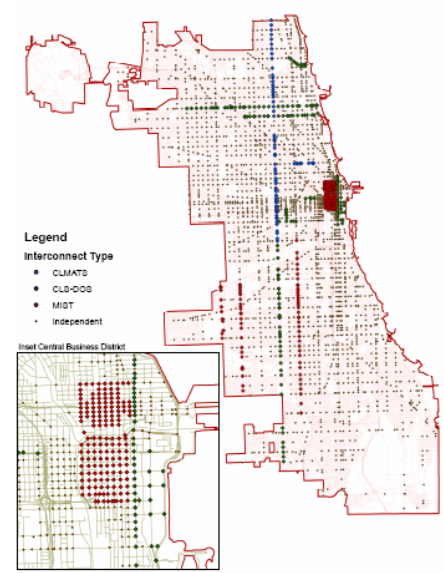
**Project:**  
Ashland Avenue  
Alternate for Dan  
Ryan Reconstruction

**Project Lead:**  
Chicago Office of  
Emergency Management  
and Communications  
(OEMC)

**Project Team:**  
Chicago Department of  
Transportation  
Chicago Skyway  
Illinois Department of  
Transportation

- 13.8 miles
- 39 intersections
- Operated under MIST from Chicago TMC
- 26,000-44,000 ADT

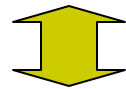
City of Chicago Signal Interconnect





# Pre-emption, Priority Tools

- **Emergency Vehicle Pre-emption**
- **Highway Rail Interconnects**
- **Transit Signal Priority**



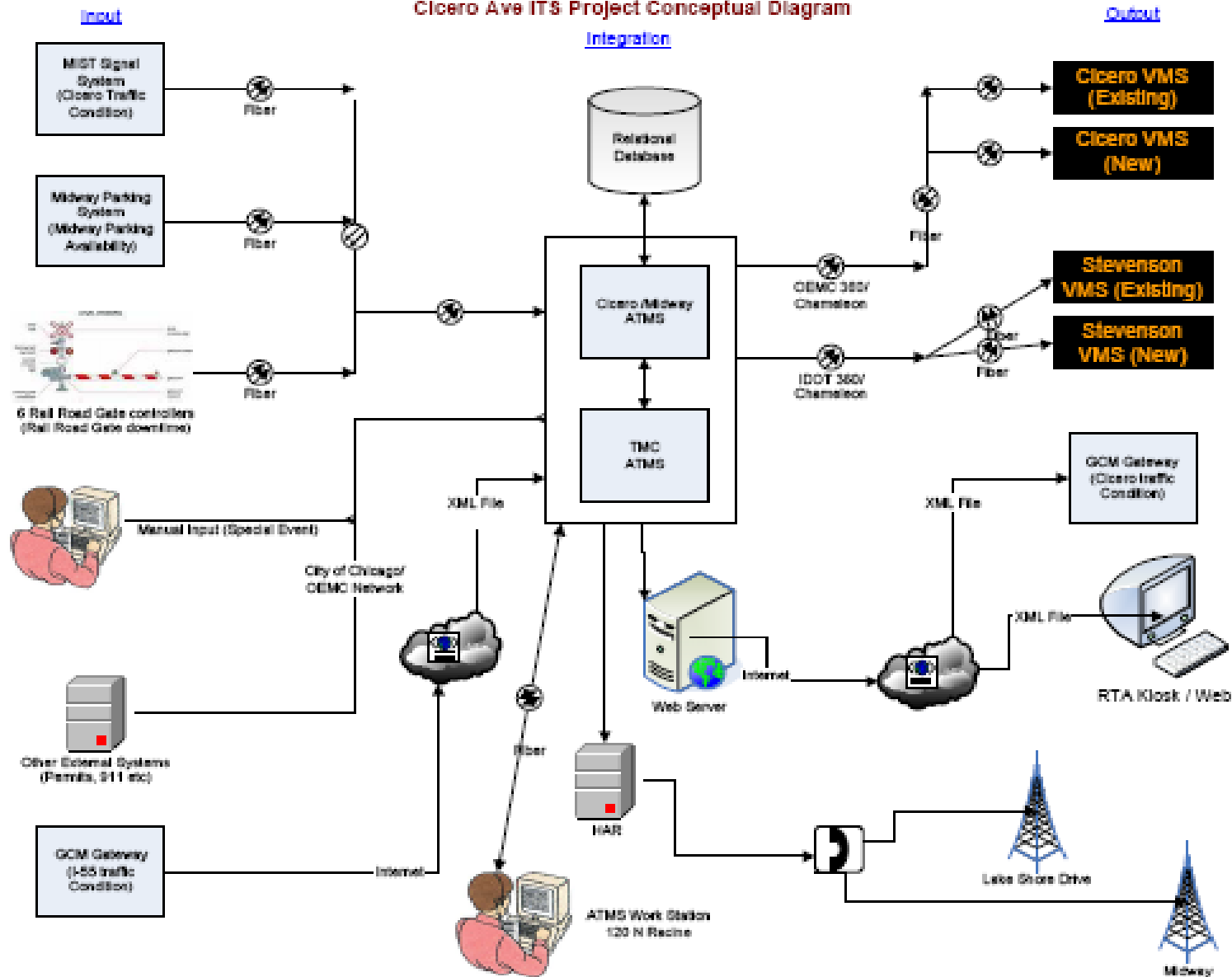
- **Western Ave. Transit Signal Priority System Pilot**
- **Cicero Ave. Smart Corridor RR Gate Information**



# Cicero Ave. Smart Corridor / Midway HAR



Cicero Ave ITS Project Conceptual Diagram





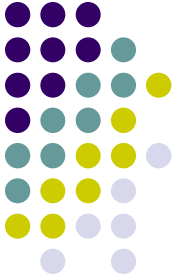
# Traveler Information Tools

- **Broadcast Media**
- **Dynamic Message Signs**
- **Highway Advisory Radio**
- **Subscription Services, e-Mail Alerts**
- **Mobile, Wireless Services**
- **Internet**

<http://www.egov.cityofchicago.org/city/webportal/home.do>

**Go to: “Traffic & Transportation” and “Travel & Transportation”  
for Traffic Advisories, Street Closures, etc.**

# Arterial DMS





Gary-Chicago-Milwaukee Corridor - Microsoft Internet Explorer  
Address: [http://www.gcmtravel.com/gcm/maps\\_chicago.jsp](http://www.gcmtravel.com/gcm/maps_chicago.jsp)

**GCM Travel**  
Gary • Chicago • Milwaukee Corridor Transportation Information

Home My Travel Maps Reports Cameras Major Links Help

Map Navigator

Map Legend

Icon	Description
	Chicago-oriented Travel Times (mins.)
	Link Travel Times (mins.)
	Incident
	Heavy Congestion
	Medium Congestion
	Light Congestion
	Uncongested
	Unknown Congestion
	Point Construction
	Section Construction
	Airport
	Message Sign
	Camera

In cooperation with the University of Illinois at Chicago Artificial Intelligence Lab

Last IDOT expressway travel time update @ 09:10:00 AM CDT. Last Tollway travel time update @ 09:15:19 AM CDT.

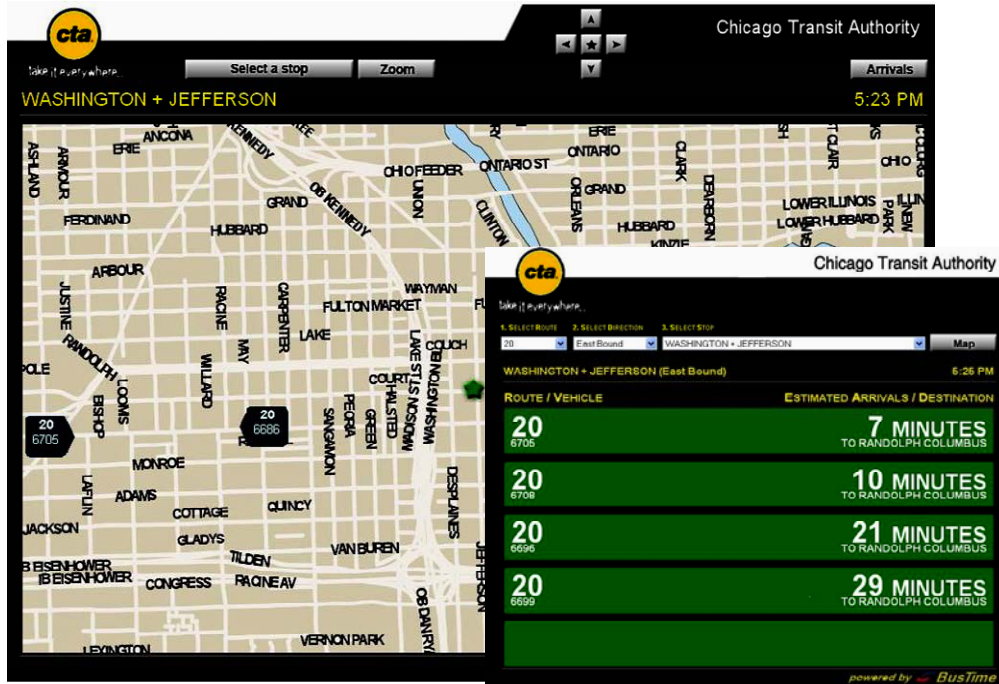
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This site is best viewed in [Internet Explorer 5.0+](#) or [Netscape 6.0+](#) with [cookies](#) and [Java Script](#) enabled.

Wed Oct 25 09:15:20 CDT 2006

start Novell Group... Microsoft Word Adobe Reader Gary-Chicago-Mi... Microsoft Excel... Removable Disk... Microsoft Power... 4:16 PM

Travel times  
Congestion  
DMS  
Cameras  
Construction  
Incidents



Project:  
**CTA Bus Tracker**

[www.ctabustracker.com](http://www.ctabustracker.com)

Project Lead:  
**Chicago Transit Authority**

Project Team:  
**CTA Technology Management**  
**CTA Transit Operations**  
**Clever Devices**

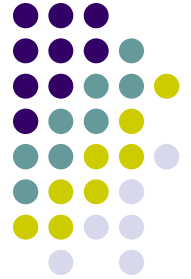


Chicago Transit Authority

CTA Bus Tracker

# Enforcement Tools

- **Red-light cameras**
- **TMA Traffic Control Aides**



# Red Light Running



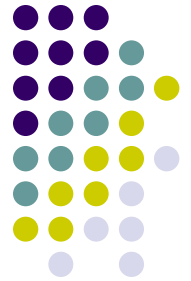


# Safety Tools

- **Pedestrian Countdown Signals**
- **Pedestrian Activation/Presence Detection**
- **Audio/Visual Notification**
- **Traffic Calming**



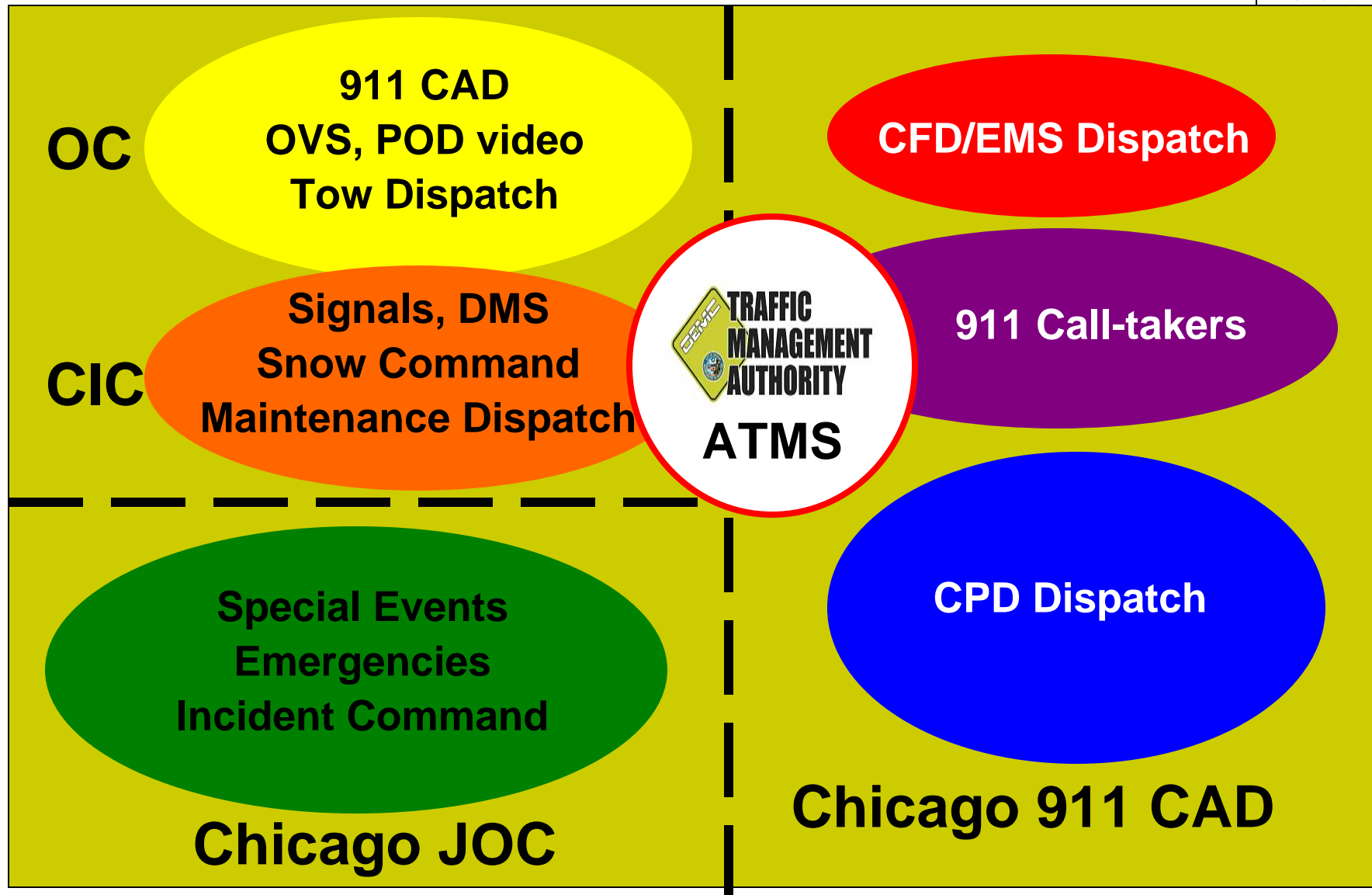
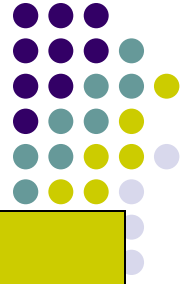
# Ped Countdown Signal



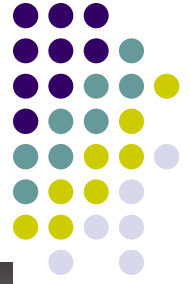
# Chicago OEMC: Co-Location of Public Safety, Emergency, and Transportation Operations



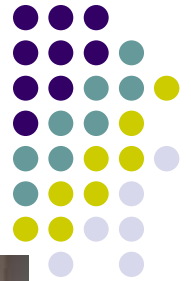
# Chicago TMC Integration



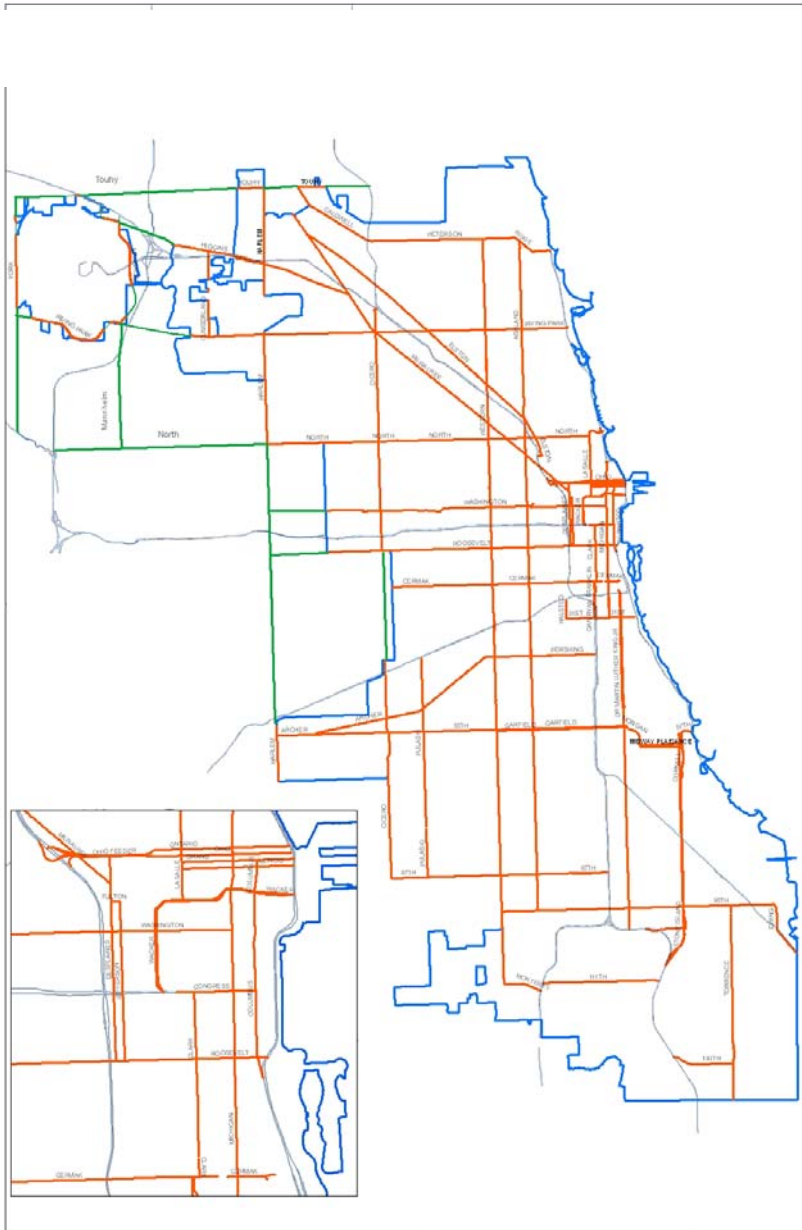
# 911 Operations Floor



# 911 – Police, Fire, Emergency Computer Aided Dispatch

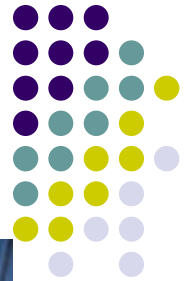


# Arterial Performance Monitoring System



- About 300 miles of major arterials
- Includes Strategic Regional Arterials
- A connected network of routes to supplement expressways
- Can support responsive traffic control strategies

# Operations Center



# Chicago Incident Center





# Signal (MIST), DMS, CCTV Workstations



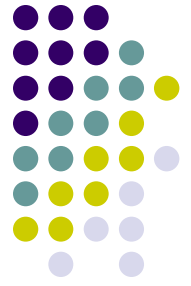


**Project:**  
Chicago Unified  
Command Vehicle



**Project Lead:**  
City of Chicago Office of  
Emergency Management  
and Communications

**Project Team:**  
MorganFranklin Corp.  
E-One Corp.



# Next steps

- **System manager contractor (in place)**
- **Develop final requirements (winter 2007/2008)**
- **RFP for system development and implementation (spring 2008)**
- **Build out TMC systems (2008/2009)**
  - Hardware
  - Software
  - Network
  - Staffing
  - Training
- **Test and operate (2009+)**

# Thanks,



**David Zavattero**

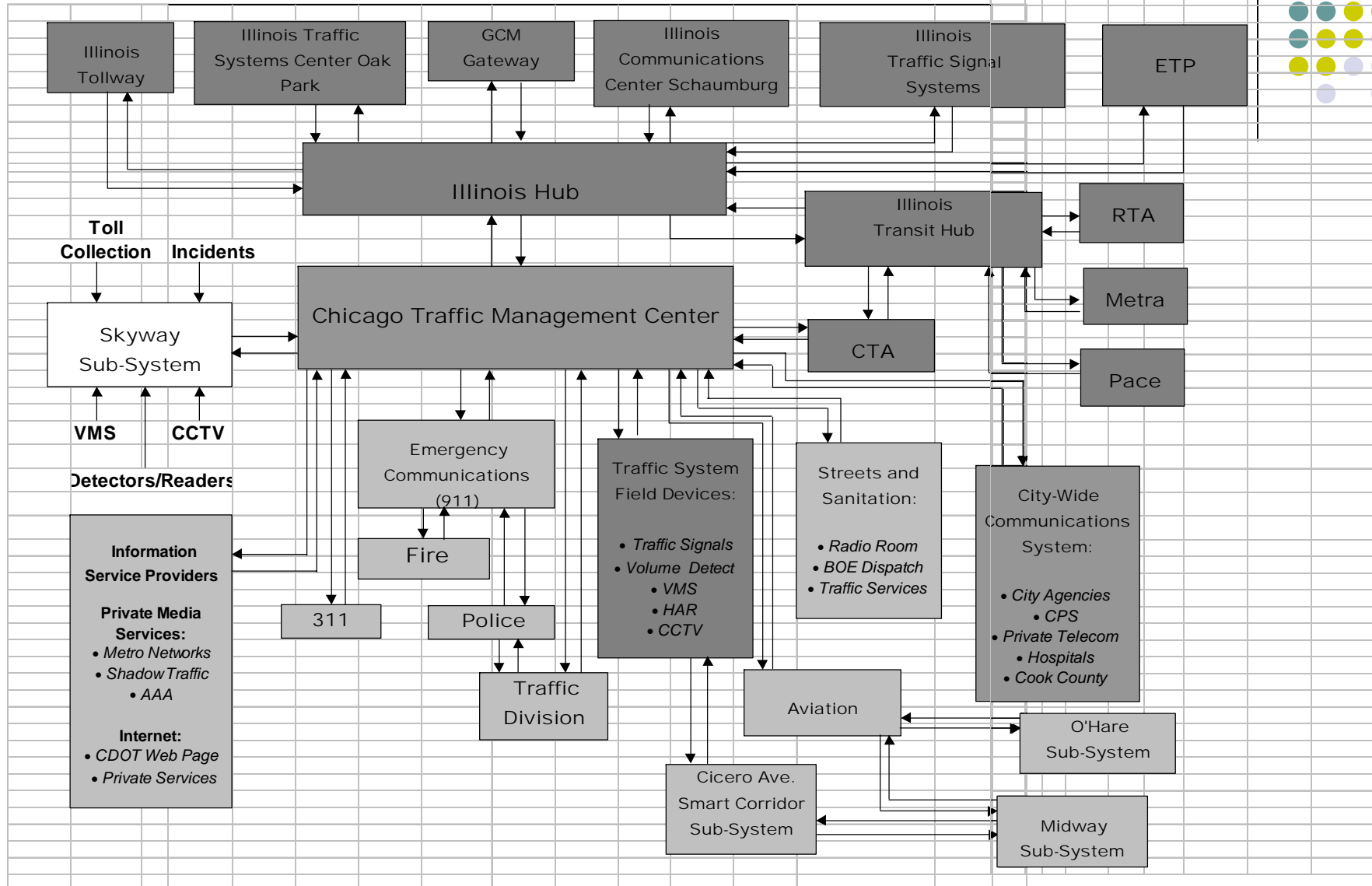
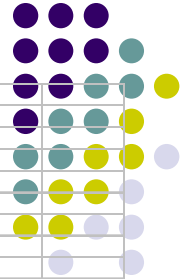
**Deputy Director**

**Chicago Office of Emergency Management and  
Communications (OEMC)**

**Traffic Management Authority**

**[dzavattero@cityofchicago.org](mailto:dzavattero@cityofchicago.org)**

# Chicago TMC Architecture



# Chicago TMC Conceptual Diagram

