



# ITS Training Program Module 1 – CCTV Systems

DMJM+HARRIS  
AN AECOM COMPANY





# Goals



*Share practical knowledge  
of ITS components.*

- “Grassroots” Training
- Pre-Deployment Training
- Lessons Learned
- Case Examples
- Interactive Sessions







# ITS Training Program

Module	Date	Subject
1	5/8/02	CCTV Systems
2	6/18/02	Detection Systems
3	7/31/02	Controllers
4	9/17/02	Variable / Dynamic Message Signs
5	10/30/02	Highway Advisory Radio
6	12/10/02	Communications
7	1/22/03	ITS Design
8	3/5/03	Systems Integration
9	4/16/03	ITS Operations & Maintenance
10	5/27/03	ITS Project Scoping



# Module 1 – CCTV Systems

## ... Outline



- Plans, Specifications & Estimates
- Operations
- Maintenance
- National Architecture / Standards

*Provide understanding of CCTV  
features and applications.*







# Schedule

- 9:00 – 12:30 Presentation of Course Materials
- 12:30 – 2:00 Box Lunch / Vendor Demos
- 2:00 – 3:00 Workshop: CCTV Spec Critique
- 3:00 – 3:30 Test on Module 1
- 3:30 – 4:00 Course Evaluation





# CCTV Systems

## *... Purpose and Need*



- Monitoring Traffic Conditions
- Incident Verification
- Data Processing
- *Security Surveillance*

*While CCTV systems are primarily used for Incident Management, they have a wide variety of other applications.*







# Monitoring Traffic Conditions



- Operator Knowledge
- Privacy Issues

*Operators need to be sensitive to the range of CCTV coverage so as not to violate privacy policies.*





# Incident Verification



*CCTVs play an important role in incident verification and dispatching the appropriate emergency services.*

- Confirm Suspected Incident
- Verify the Incident
- Assist in Managing Response







# Data Processing



*CCTVs also play an important role in traffic management and traffic engineering studies.*

- Volume
- Occupancy
- Speed
- Surveillance
- Sharing Data





# Security Surveillance



- Local Streets
- Downtown Areas
- Transit Stations
- Multimodal Facilities

*Since 9/11, FHWA has placed increased emphasis on surveillance of critical surface transportation facilities.*







# CCTV Benefits



*The initial 3-5 minutes are critical  
in using CCTVs to efficiently  
manage incidents.*

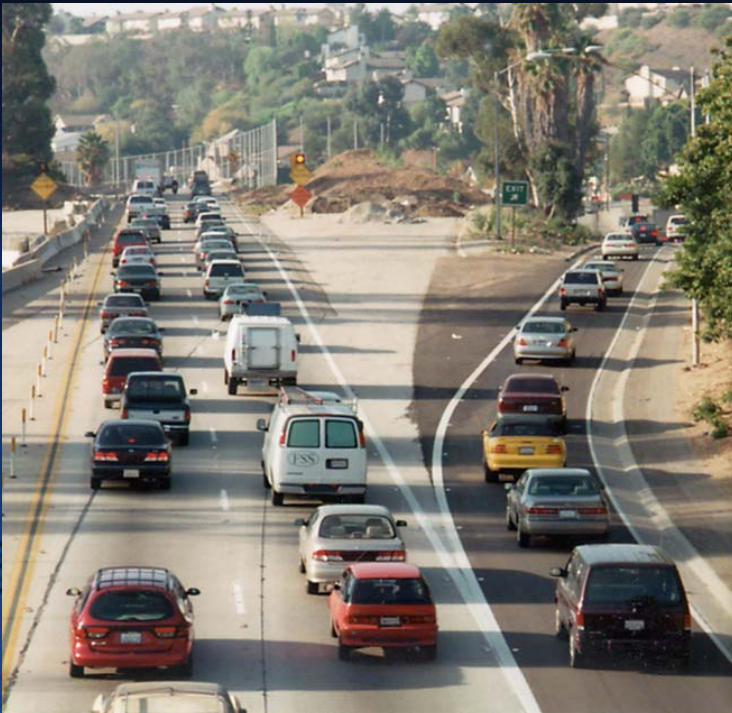
- Travel Delay Savings
- Reduction in Secondary Accidents
- Appropriate / Fast Response
- Proactive Traffic Management





# CCTV System

## ... Incident Management



*CCTVs provide a visual traffic management tool in effectively managing traffic detours during a major incident.*

- DMS Message Verification
- Detour Route Assessment







# CCTV Systems

## *... Other Applications*



- Wide Area Detection
- Ramp Monitoring
- Toll Evasion / Toll Security
- Weight / Inspection Stations
- Railroad Grade Crossings

*CCTV cameras can be used to manage railroad grade crossing violations.*





# Specification Development

*The Contractor shall furnish and install CCTV equipment cameras on approved structures as designated by the DOT. CCTV camera locations and mounting heights will be approved by Transportation Management Center (TMC) staff.*

*The camera assembly shall consist of an outdoor mounting bracket, a dome housing with built-in heater and blower, a dome sunshield, an integral receiver / driver, a tracking system, a camera / lens module and cabling. The outdoor mounting bracket shall be approved by the camera assembly manufacturer and TMC staff. The Contractor shall furnish and install cables as recommended by the manufacturer. Camera set-up activities are considered incidental to the camera assembly ...*





# CCTV Requirements



- Camera Equipment
- Camera Housings
- Lightning Protection
- Camera Locating
- Pole Requirements





# CCTV Requirements (continued)



*CCTV Systems need to be designed in accordance with local needs and conditions.*

- Resolution
- Electronics / Optics
- Communications Equipment
- Power Supply







# CCTV Housings

- Standard Enclosures
- Dome Enclosures





# Functions of Housings



- Protection
- Vandalism
- Environment

*Housing designs should consider the need to make them weather-proof as well as bullet-proof.*







# Dome Enclosures



- House Pan / Tilt / Zoom Unit
- No Separate Cabinet Needed
- Pressurized vs. Non-Pressurized
- Lowering Devices
- Optical Distortion

*Dome enclosures do not require a separate cabinet to house the electronics.*





# Standard Enclosure



- Encloses Camera Electronics
- Mounts on Pan / Tilt Unit







# Environmental Issues



- Darkness / Night
- Rain
- Fog
- Smoke

*Environmental issues increase challenges for the operator. A well designed CCTV system will mitigate these challenges.*





# Pressurized vs. Non-Pressurized



*Pressurized housing protects the electronics by reducing intrusion of dust particles within the unit.*

- Inert Gas
- Protects Electronics
- Reduces Dust Particles







# CCTV Structure Attachments



*In District 6, a CCTV camera was mounted on top of the City of Miami Police Department Building as part of the I-95 ICS Package "A" contract.*

- Building Mount
- Under Bridge Mount
- Sign Structure Mount
- Traffic Signal Pole Mount





# Lightning Protection



- Grounding Rods
- CCTV Protection
- Pole Protection
- Fiber Connections from Camera

*Need to install properly rated protectors on all interconnected wiring from the camera to the operator console.*







# Pan / Tilt / Zoom Assembly



- Purpose of Pan / Tilt
- Available Options
- Control / Preset Positioning

*The Pan / Tilt assembly allows for the precise positioning of the camera to view all areas from all sides of the camera.*





# Pan / Tilt / Zoom Assembly Options



- Presets – 79 to 99
- Variable Speed
- Continuous Rotation - 360°
- Variable Zoom Speed: 0-200°/sec.
- Focus Speed <1.8 sec (end to end)

*CCTV specifications need to clearly define the required functions and features.*





# Terms

- Auto Focus – Lens is automatically set to correct illumination
- Auto Iris – Iris opening is automatically adjusted to allow the correct illumination
- Auto Pan – Camera pans continuously between 2 set positions
- Pan – Camera movement in the horizontal direction





## Terms (continued)

- Pre Set / Pre-position / Privacy Zones – Segments of the field of view of the camera where the video signal is blanked to prevent from being seen
- Tilt – Camera movement in vertical direction
- Zoom – Changing the effective focal length to allow different fields of view







# Display Resolution



- Match the Source with the Display
- 640 x 480, 800 x 600, 1024 x 768
- 1280 x 1024, 1600 x 1200
- Native Resolution

*Industry standard has  
changed over time.*





# Horizontal Resolution



- Color – 450 TV lines
- Mono – 550 TV lines
- Color/Mono – 460 TV lines







# Picture Element / Imager

- 1/4-inch Interline Transfer (IT) Charged Couple Device (CCD)
- 768(H) x 494(V), 380,000 pixels
- 752(H) x 582(V), 440,000 pixels
- 847(H) x 582(V), 490,000 pixels





# Dome Assembly Speeds



- Pan – Variable, 0.25 - 300°/sec.
- Autopan – Variable, 3 - 45°/sec.
- Tilt – Variable, 0.25 - 110°/sec.







# Power



- Power – 35W to 116W
- Heater Power – 70W
- Surge Protection – Clamped at 6.5 V (Video Level)

*Should have some form of  
in-line current limiting resistor.*





# Optics

- Optical Zoom – 22x
- Digital Zoom – 8x
- Total Zoom – 176x ( $22 \times 8 = 176$ )
- Auto Iris – Yes
- Auto Focus – Yes
- Aperture Max – f/1.4 to f/3.0
- Focal Length – 4 to 88 mm
- Zoom – 18x to 22x for Traffic Management Applications







# Communications



*Fiber Optics is typically used when long runs are required; strong signals are needed; and large bandwidth is desired.*

- Fiber Optics
- Twisted Pair
- RF Wireless





# Noise Reduction

- Reduction of noise lies in
  - Correct System Design
  - Selection of Equipment
  - Selection of Transmission Systems







# Color vs. Monochrome

Color	
Advantages	Disadvantages
Higher Picture Quality	Higher Cost
	Needs Color Monitors
Monochrome	
Advantages	Disadvantages
Lower Cost	Lower Picture Quality
Better in Low Light	



# Color Day / Night Cameras

- Provides the advantages of both the Color and the Monochrome camera technologies
- Color (high picture quality) at adequate light levels
- Low light sensitivity
- Auto switching







# Design Criteria





# CCTV Location Selection

- Field of View / Spacing
  - Knowledge of Local Traffic Operations
  - Knowledge of Local Conditions
- Clear Zone / Guardrail Requirements







# Camera Siting Considerations



*CCTV siting is a function of both project goals and roadway characteristics..*

- Accident Rates
- Traffic Volumes
- Weaving and Merging Areas
- Visual Obstructions
- Relationship to Detection & DMS
- Roadway Geometry
- Maintenance
- Cost





# Field of View / Spacing



- Straight Sections
- Limited Obstructions
- Key Interchanges
- Signs / Overpasses
- Volume
- Accident Rate
- Cost vs. Coverage

*High-level interchanges create challenges in the siting of CCTVs to provide adequate coverage.*







# Types of Coverage

- Continuous (Full) Coverage
- Limited Coverage (Major Interchanges)
- Bridges





# Full Coverage



- ½ to 1 mile spacing
- Pan / Tilt / Zoom
- Mounted 35' to 50'

*While full coverage is desirable along urban interstates, partial coverage may be sufficient within non-urbanized sections of District 4.*







# Limited Coverage



*The I-595 / Sawgrass Expressway Interchange will be a challenge in locating CCTV poles to provide required views of all ramps.*

- 2 Cameras
- Key Interchanges
- High Mast Poles (100')





# Bridges



- Camera Locations
- Mounting
- Lighting

*CCTVs may be attached to existing bridges in monitoring traffic below the structure..*







# CCTV Structures / Attachments



*CCTVs attached to cell towers provide an opportunity for wide area views.*

- Poles
- Sign Structures / Bridges
- Private Buildings / Structures
- Billboards, Cell Towers, etc.





# Poles



- Standard Height: 35'-50'
- High Mast
- Full Rotation
- Wind Loads
- Existing vs. New Poles

*Design of pole foundations need to consider utility conflicts; the need for ground rod grids as well as pole height..*







# Sign Structures / Bridges



*CCTV units add very little dead load  
and wind load to existing sign structures.*

- Existing Structures
- Cost Effective
- No Structural Issues





# Private Buildings / Structures



*Smart Routes is responsible for CCTV installation and maintenance outside FDOT ROW.*

- Buildings
- Billboards
- Cell Towers
- Water Towers
- Toll Plaza Facilities





# Cost Decisions



- Camera / Equipment
- New Pole / Foundation
  - Height of Pole
  - Height of Cameras
- Distance between Cameras
- Power Supply
- Communications

*Consider life-cycle costs as part of the cost analysis.*



## Typical Costs Standard Poles

- Dome Camera Assembly \$3-\$5 K
- Equipment to Install \$3-\$5 K
- Modems \$1-\$2 K
- Poles w/Lowering Device \$12-\$14 K
  - Includes foundation
- Power \$1-\$2 K
- Labor \$8-\$10 K
- Mobilization \$3-\$4 K
- TOTAL \$31 - \$42 K**





# Typical Costs High Mast Poles

• Dome Camera Assembly	\$3-\$5 K
• Equipment to Install	\$3-\$5 K
• Modems	\$1-\$2 K
• Poles w/Lowering Device	\$24-\$28 K
– Includes foundation	
• Power	\$1-\$2 K
• Labor	\$10-\$12 K
• Mobilization	\$3-4 K
<b>TOTAL</b>	<b>\$35 - \$58 K</b>



# Break







# Operations





*Describe the chain of events that might occur today if there were a two car non-injury accident along I-95 NB in the left lane during the AM rush hour.*







## 2-Car Accident



- Incident Detected
- 911 Called
- FDOT Responds
- FDOT Notifies FHP
- FHP Responds
- FHP On-site, Requests Assistance
- Tow Trucks, etc. Responds

*How long does it take to respond to  
an incident along the Interstate today?*





# Time Involved

- Incident Detected
  - 911 Called
  - FDOT responds
  - FDOT Notifies FHP
  - FHP Responds
  - FHP On-site
  - FHP Requests Assistance
  - Tow Truck Responds
  - Lane(s) Opened
- All within first 5 minutes
- 10 minutes
- 5 minutes
- 20-30 Minutes
- 20-30 Minutes later





*Where might time be saved if CCTVs were in place?*





*How would the use of CCTVs  
improve response to the  
motorists?*







# Camera Control by Operator



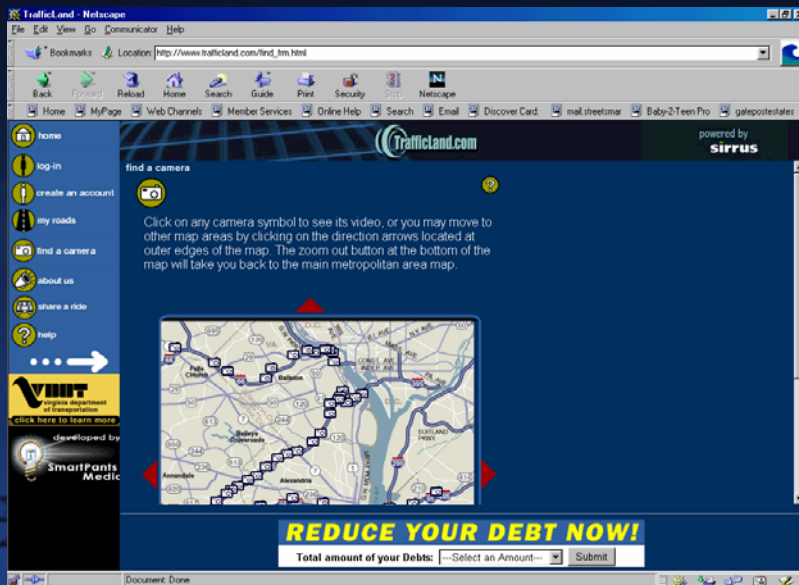
*Joystick control provides the Operator with flexibility in managing the CCTV system.*

- Selecting Camera Image
- Assign Image to Monitor
- Pan / Tilt / Zoom Camera
- Focus Camera





# Monitoring Requirements



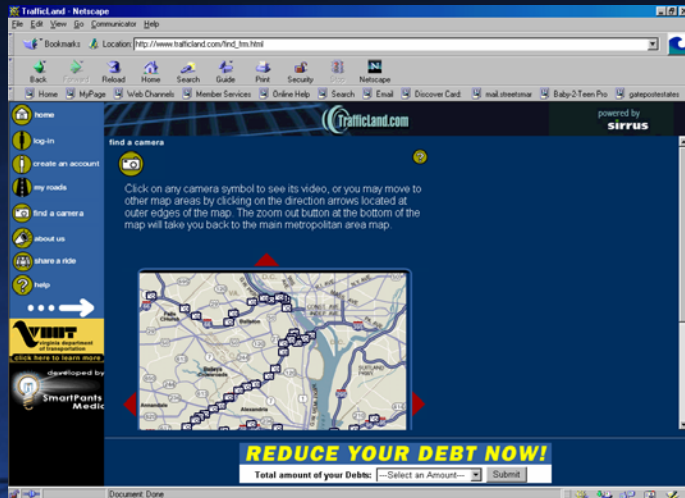
- Web Site Interfaces
- Protocols
- GIS Management

*DOT Websites provide the Operator with an opportunity to share video images with other agencies and the public.*





# Web Site Interface



- Agency Developed / Maintained
- Private Developed / Agency Maintained
- Public / Private Partnership

*Smart Routes is responsible for the development and maintenance of the traveler information website within SE Florida.*

## Traveler Information



Road  
Rangers



SunPass



Traffic  
Management

Publications

Links

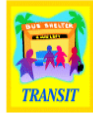
Contact Us



HOME



ROADSIDE



TRANSIT



KIOSK

SunGuide **Traveler Information Service** is about providing people with the right information at the right time to improve the quality and convenience of their trip and the overall performance of the transportation system.

**ITS** is the umbrella term for the utilization of advanced technologies to increase safety and efficiency. True benefits are gained when various elements are used in combination. These may include:

- Dynamic Message Signs
- Highway Advisory Radios
- Closed-circuit TV cameras
- Ramp-Metering
- Roadway Detectors
- Web-sites and E-mail
- Pagers
- On-board computers
- Traffic Kiosks
- Conventional news media outlets



dynamic message sign

## Traffic Management



Road  
Rangers



SunPass



Traveler  
Information

Publications

Links

Contact Us



*"We need to make the most out of our existing transportation system."*

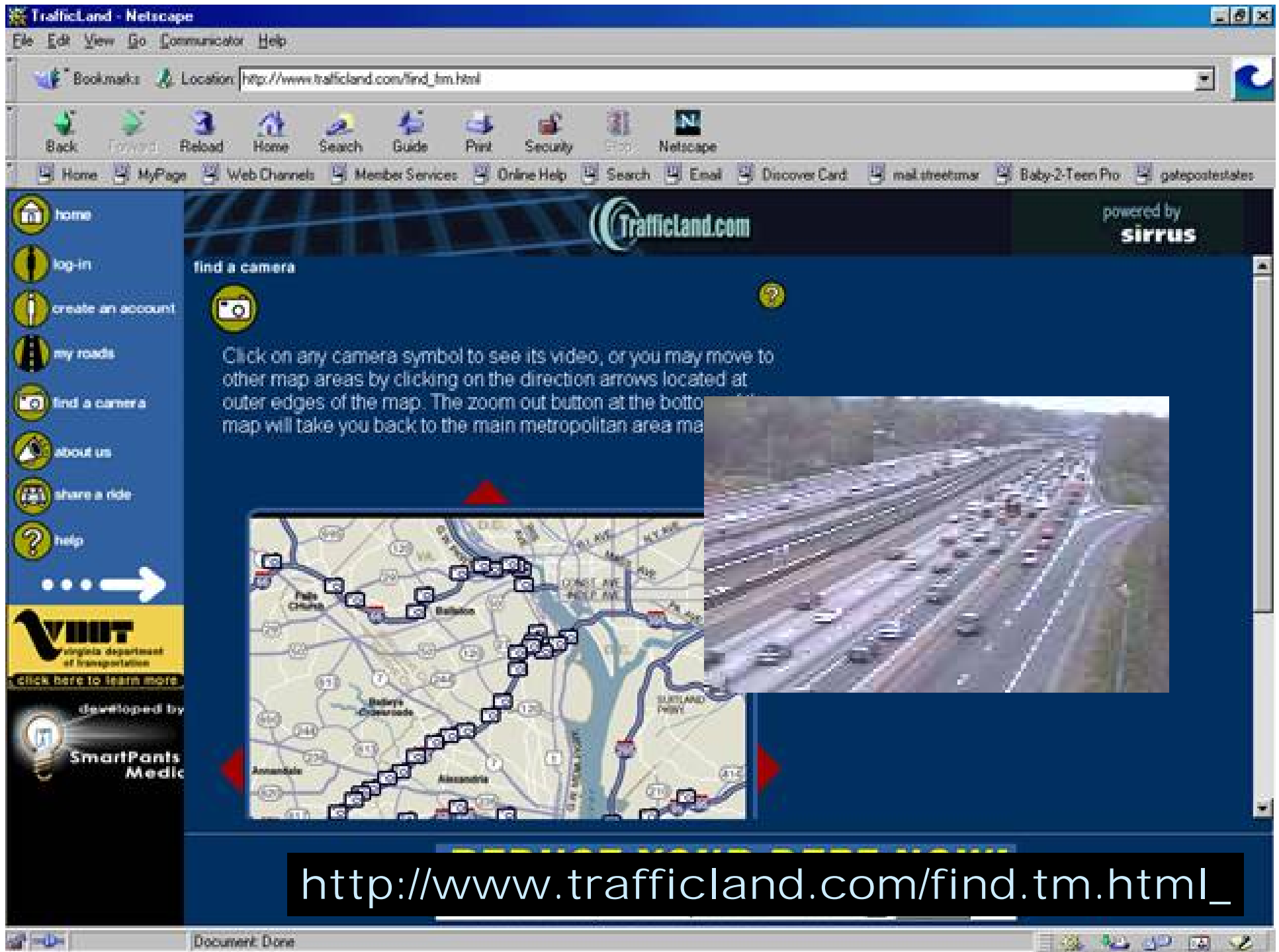
**Traffic Management Centers (TMC) -- The nerve center.**

TMC is a physical location to monitor traffic conditions, respond to incidents and coordinate ITS programs. A center where information coming in from pavement sensors and cameras can be distributed to motorists in real-time. Law enforcement and emergency services will be at the table and this will allow coordinated



<http://www.sunguide.org/manage.htm>







brought to you by:

## Rhode Island Department of Transportation

4/18/02 2:07:21 PM

[TMC  
Home Page](#)

[About  
Rhodeways](#)

[Current  
Traffic Incidents](#)

[Highway  
Advisory Radio](#)

[Live  
Traffic Cameras](#)

[Sign the TMC  
Guest Book](#)

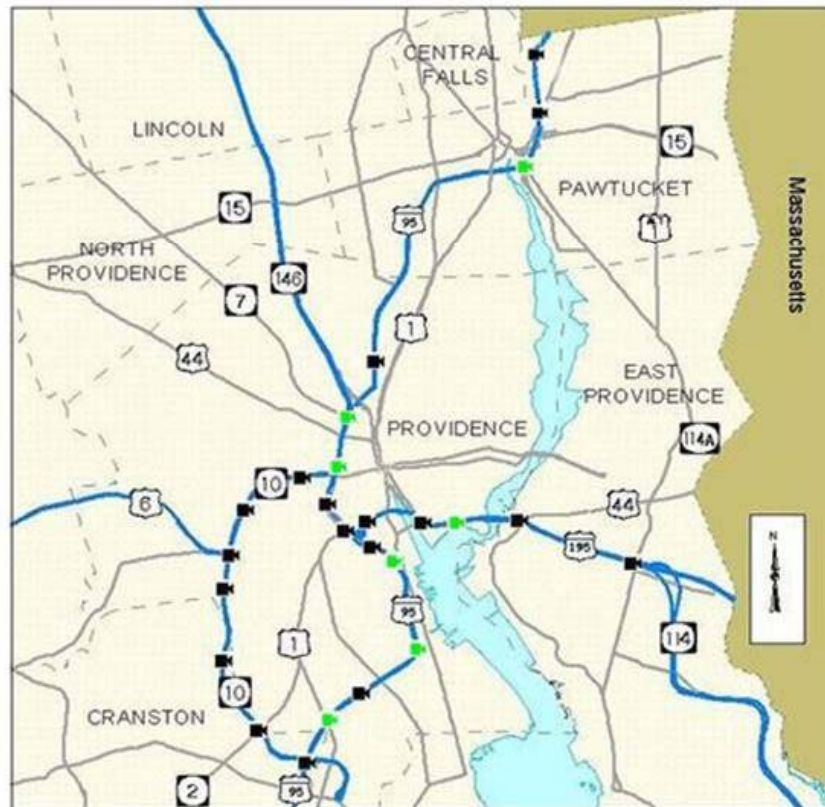
[Contacting  
the TMC](#)

[RIDOT  
Home Page](#)

[Live Camera  
Pictures](#)



**Camera Service Notice:** The Transportation Management Center is currently making minor hardware upgrades to cameras throughout the coverage area. During this time some of the cameras may be temporarily unavailable.



Click on a camera to see a view.

Green cameras contain links to additional information about Rhode Island.

Looking for the future traffic forecast?

Visit RIDOT's Future Traffic Forecast Page.

<http://www.tmc.state.ri.us/TrafficCams/LiveCams.asp>




Houston TranStar - Netscape
File Edit View Go Communicator Help




Bookmarks Location: http://traffic.tamu.edu/

Back Forward Reload Home Search Guide Print Security Stop Netscape





Home MyPage Web Channels Member Services Online Help Search Email Discover Card: mail.streetsmar Baby-2-Teen Pro gatepoststates

Traffic Map	Text Reports	Speed Charts	New! Historical Data
Freeway Cameras	Route Builder	Emergency Closures	Construction Closures








The Greater Houston Transportation and Emergency Management Center

About TranStar | MAP | HOV Lanes | Weather | County OEM | City OEM | Ozone Alerts

**Houston TranStar**  
 6922 Old Katy Rd.  
 Houston, TX 77024  
 Phone: (713) 881-3000  
 Fax: (713) 881-3006




[Environmental Speed Limit Reduction](#)

Comments can be e-mailed to [www@traffic.tamu.edu](mailto:www@traffic.tamu.edu)

<http://traffic.tamu.edu>

[Transportation Institute](#) | [Texas A&M University](#)

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Document: Done

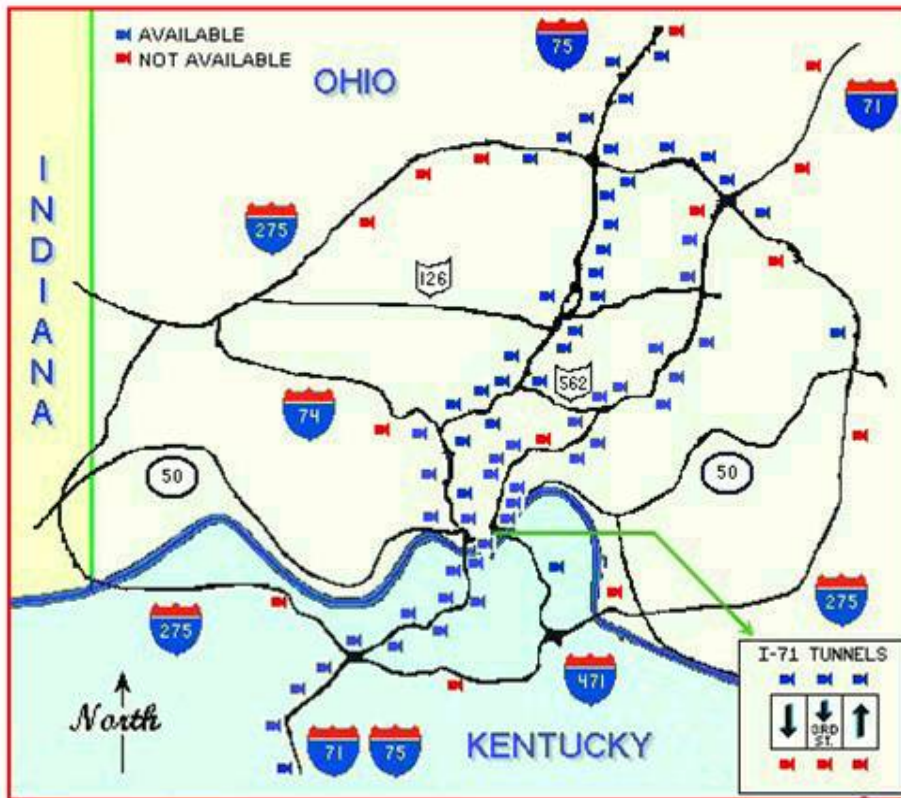


Sunday

March 17, 2002

3:28:34 P.M.

Best viewed with Netscape Navigator at a screen resolution of 1024 x 768.



Choose a camera location by clicking the left mouse button over the desired camera.

New images are available approximately every five minutes.

<http://www.artimis.org>



Ohio: I-275 at I-75

Mile 43.6 on I-275, 16.8 on I-75, located on South side of I-275, West of I-75



NORTH



SOUTH



EAST



WEST

REFERENCE VIEWS ONLY.



NWsource: Traffic - Netscape
File Edit View Go Communicator Help
Netsite: http://traffic.nwsource.com/
Back Forward Reload Home Search Guide Print Security Stop Netscape

Advertising

Featured Destination:  
[Mount Rainier](#)

2002 RANGER XLT SUPER CAB  
\$10,171 PLUS TAX & LICENSE

\$15,771 Sound Price,  
-2000 Ford Cash  
-500 FDAA Cash  
-500 Ranger RCL, -200 FMCC  
-1500 OLC, -500 FMCC  
-400 College Grad Cash

A Service of The Seattle Times Company
seattletimes.com
NWclassifieds
NWsource

NWsource • traffic

HOME CITY GUIDE OUTDOORS TRAVEL SHOPPING
weather traffic news fun & games message boards NWclassifieds

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NWsource guides
Weather
Traffic

- King County flow map
- Pierce County flow map
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NWclassifieds
Newsletter sign-up
NW Web links
Maps & directions
Yellow pages

Traffic: Home

Weather

LIVE cameras

WSDOT
Mar 17, 2002 12:33 PM PST

Select view:

- [I-5: 236th St. SW](#)
- [I-5: NE Northgate Way](#)
- [I-5: NE 45th St.](#)
- [I-5: Mercer St.](#)
- [I-5: Southcenter](#)
- [I-90: midspan](#)
- [SR 520: midspan](#)
- [I-405: NE 8th St.](#)
- [I-405: NE 85th St.](#)
- [I-405: NE Park Drive](#)

ALL CAMERAS:  
[map of all 82 camera locations.](#)

Images courtesy of  
[Washington State Department of Transportation.](#)

Flow Maps

Current traffic flows for [King](#) and [Pierce](#) counties

Latest Incidents

NWclassifieds
Top Jobs

Regional Director of  
Clinician Services  
Planned Parenthood  
Applicant may be  
eligible for \$5000  
bonus.

Sr. Learning &  
Development  
Specialist  
REI  
New Position!  
Professional Trainer.

More Jobs

About Top Jobs

http://traffic.nwsource.com

http://www.nwsource.com/weather/



# Geographical Information System (GIS)



- Map Display System (MDS)
- Computer-assisted information management system of (geo)graphically referenced data
- Two closely integrated databases
  - Spatial (locational, or graphical)
  - Attribute (statistical, or database)







# GIS Management



- Tool that acts as TMS backbone
- Operational Philosophy:
  - Multiple Agencies
  - People using the Same Information
- Provides for Proactive Operations





# GIS Is Information Management



- Present large amounts of information in a form that is easily assimilated by an Operator
- Quicker response
- Automated pre-programmed response







# Video Monitor



- Started with CRT Monitors





# Video Wall



*FDOT District 5 TMC Video Wall in Orlando.*

- Increase demand for video
- Multiple CRTs organized into a Video Wall







# Display Technology Improved



*Houston TranStar TMC Video Wall..*

- Display Technology improved
- Video Wall concept remained the same
- Operations philosophy remained the same





# Change in Philosophy



- Different types of information
- Information from different sources

*Video Wall becomes an extension  
of the operators workstation*







# GIS In Traffic Management



- Camera Selection and Control
- Map Showing Camera Locations
- Pull Down Menus
- Camera Selection based on Congestion

*The GIS Map enables the Operator to “drill down” to the appropriate level of detail to effectively manage an incident.*



# Maintenance



*Drop-down poles facilitate maintenance and replacement of CCTV units and parts.*

- Cameras
- Poles / Structures
- Monitoring Equipment







# Camera Maintenance



- Remove and replace
- Stock spare assemblies
- Factory repair





# Pole Maintenance







# Mounting Equipment Maintenance

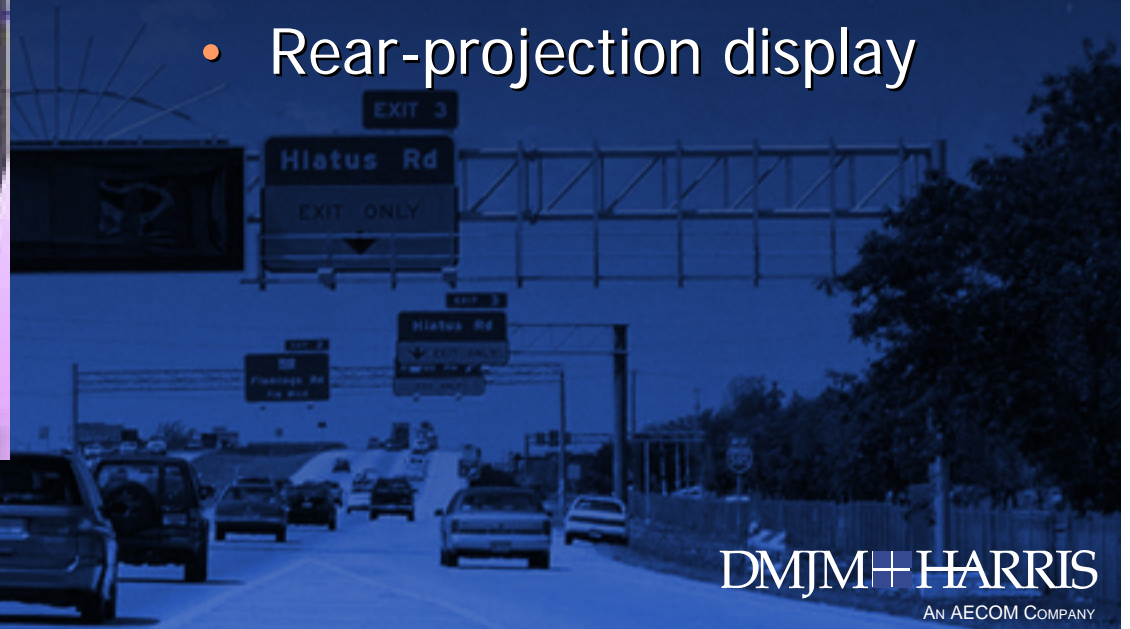




# Monitoring Maintenance



- Multi-lamp optical engine
- Median lamp life > 8,000 hrs
- Rear-projection display



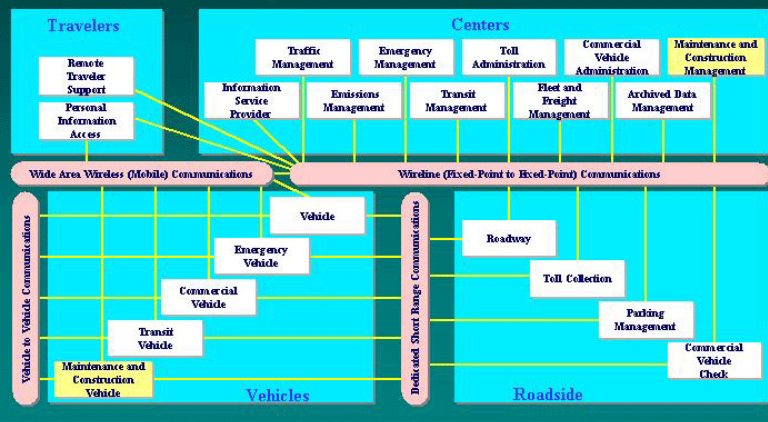




# National ITS Architecture

## National ITS Architecture Physical Architecture

• Subsystems and Interconnects

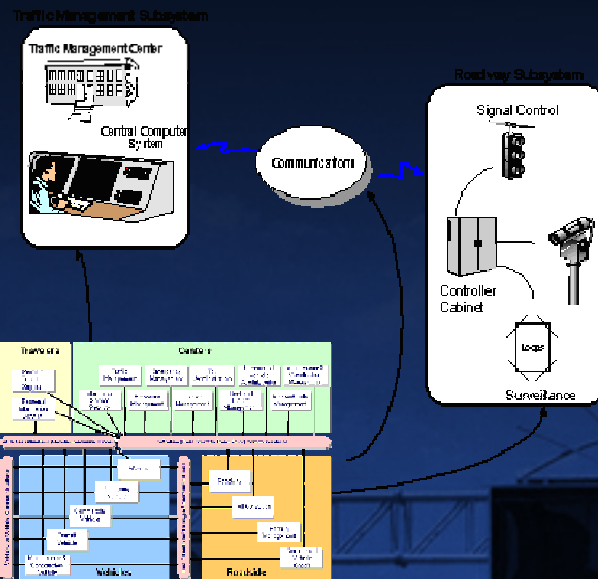


- Systems Integration
- Center-to-Center Interfaces
- System Compatibility

*Development and implementation of ITS Programs need to be consistent with the National ITS Architecture to be eligible for federal funding.*



# ITS System Goals



- Increase System Efficiency
- Improve Mobility
- Reduce Fuel Consumption
- Minimize Environmental Cost
- Improve Safety
- Increase Economic Productivity
- Create ITS Market

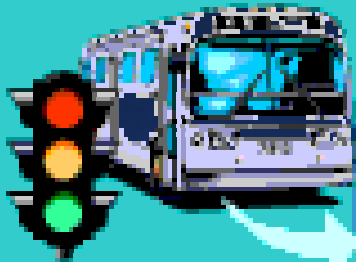
*ITS System goals set the foundation for providing a safe, efficient and well maintained transportation system.*





# CCTV Market Packages

## Market Packages



## Market Packages

- ATMS01 Network Surveillance
- ATMS04 Freeway Control
- ATMS05 HOV Lane Management
- ATMS07 Regional Traffic Control
- ATMS08 Incident Management

*Market packages are used to plan and implement integrated transportation systems customized to local needs.*




National ITS Architecture - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites History Print View Source

Address <http://itsarch.iteris.com/itsarch/> Go Links »



Version 4.0

- Home
- Search
- What's New
- Hypertext View
- Document View
- Database View
- User Services
- Logical Architecture
- Physical Architecture
- Market Packages
- Physical Entities
- Standards
- Training
- Turbo Architecture
- Glossary
- Acronyms
- CD Orders
- Contact Us

Last updated 04/17/02

# National ITS Architecture

## Background

The National ITS Architecture provides a common framework for planning, defining, and integrating intelligent transportation systems. It is a mature product that reflects the contributions of a broad cross-section of the ITS community (transportation practitioners, systems engineers, system developers, technology specialists, consultants, etc.) over a nine year period. The architecture defines:

- The functions (e.g., gather traffic information or request a route) that are required for ITS
- The physical entities or subsystems where these functions reside (e.g., the roadside or the vehicle).
- The information flows and data flows that connect these functions and physical subsystems together into an integrated system.

As you navigate through the National ITS Architecture, additional background information is often only a click away. A comprehensive [glossary](#) of architecture terms is on the menu and is also linked with the architecture content. If a **green** highlighted and underlined term marked with an asterisk (\*) is unfamiliar to you, click on it to see its definition and links to other related terms. (Note: In browser versions earlier than 4.0, green highlighting of the glossary terms may not be supported. In this case, glossary terms will be highlighted with the same color as the other links.)

If you would prefer a summary document that you can print and read over coffee, a brief document is available that presents the [key architecture concepts](#). A [training course](#) provides a more comprehensive look at the National ITS Architecture and the ways in which it can be applied.

## Where to Start

There are three ways to navigate through the National ITS Architecture:

1. The [hypertext view](#) provides immediate, interconnected access to all the elements of the architecture definition.

<http://itsarch.iteris.com/itsarch/index.htm>

If you are wondering which view is best for you, we have a few suggestions

Done Internet





# ITS Standards

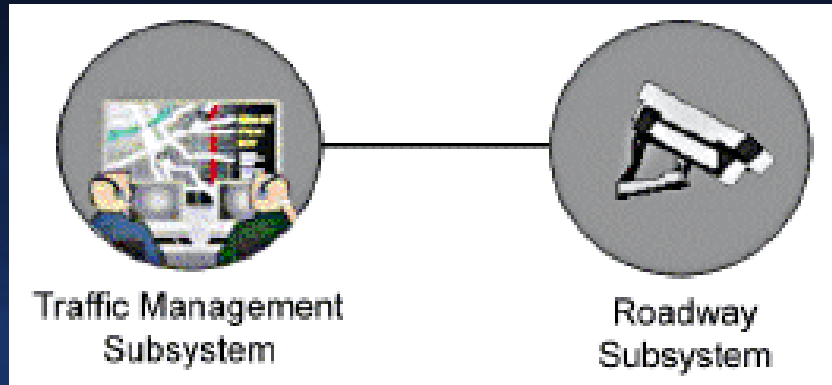


- Promotes Interoperability
- Does Not Guarantee Interoperability
- Same Level of ITS Service Across Nation

*The U.S. DOT ITS Standards Program is working toward the widespread use of standards to encourage the interoperability of ITS systems.*

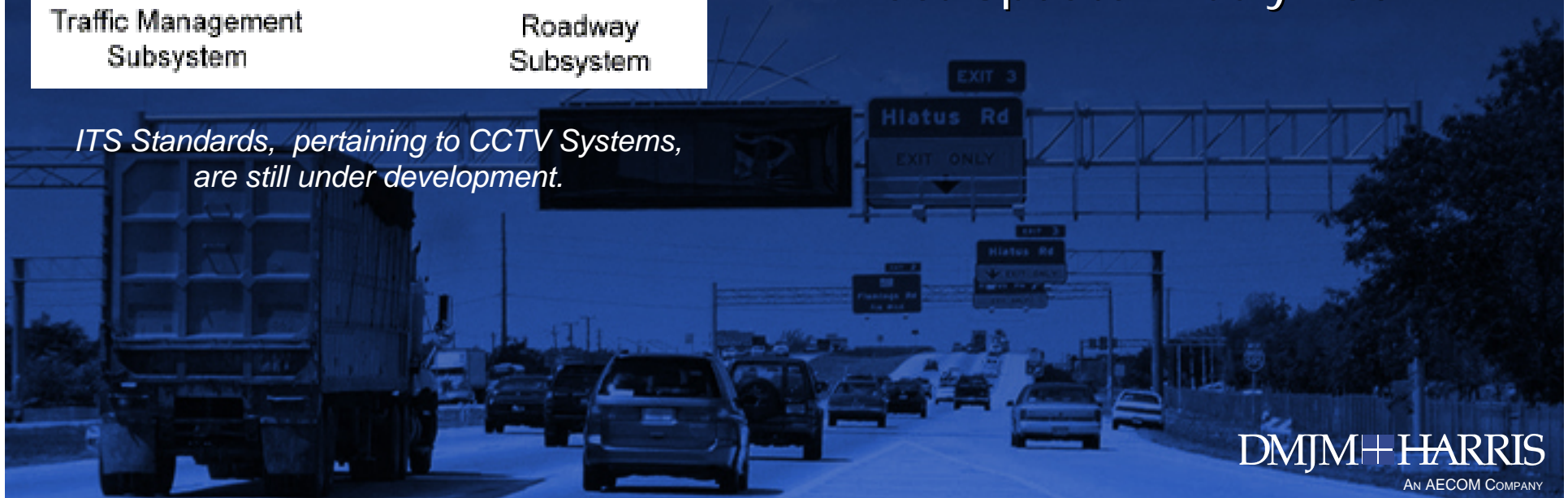


# ITS Standards



- TMC to Roadside Interface
- Standard
- Last Update in July 2001

*ITS Standards, pertaining to CCTV Systems, are still under development.*





- 16 Standards that comprise Video Surveillance Application Area
  - 9 Published
  - 1 Approved
    - Waiting Publication
  - 4 Balloted
    - Approval expected Summer 2002
  - 2 Under Development
    - Object Definition for Video Switches
    - Transportation Management Protocol





# ITS Standards Contacts

- **Mike Schagrin** of the Federal Highway Administration (FHWA), is Manager of the U.S. DOT ITS Standards Program. Telephone: 202-366-2180 E-mail: [mike.schagrin@fhwa.dot.gov](mailto:mike.schagrin@fhwa.dot.gov)

**Bill Jones** is the Technical Director of the U.S. DOT Joint Program Office (JPO).

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# ITS Standards

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Questions about ITS Standards, visit:

[Standards Forum](#)

Click [here](#) for this site's viewing requirements.

## About ITS Standards

ITS standards are industry-consensus standards that define how system components operate within a consistent framework. The framework is known as the [National ITS Architecture](#). By specifying how systems and components interconnect, the standards promote interoperability.



Traffic Control Center

To expedite deployment of nationally interoperable ITS systems and services, the U.S. DOT supports specific ITS standards initiatives, especially in areas that have significant public benefit.



## The ITS Standards Program

The U.S. DOT ITS Standards Program is working toward the widespread use of standards to encourage the interoperability of ITS systems. Through cooperative agreements with five standards development organizations (SDOs), the Standards Program is accelerating development of about 100 non-proprietary, industry-based, consensus ITS standards, and is encouraging public-sector participation in the development process.

The Standards Program is maturing from a primarily standards development program to a standards deployment program by providing support. Such support includes providing standards training and technical deployment assistance, and "learning by doing" deployment. In addition, the program is coordinating U.S. ITS standards efforts with international standardization.

<http://www.its-standards.net>



**Questions?**





# Lunch Break

- Vendor Demonstrations
  - Vicon
    - Jim LaBatt, Blackhawk Enterprises
  - Cohu
    - Gerry Slosar, Cohu Ind., Electronics Division





# Workshop Assignment

## CCTV Specification Critique

