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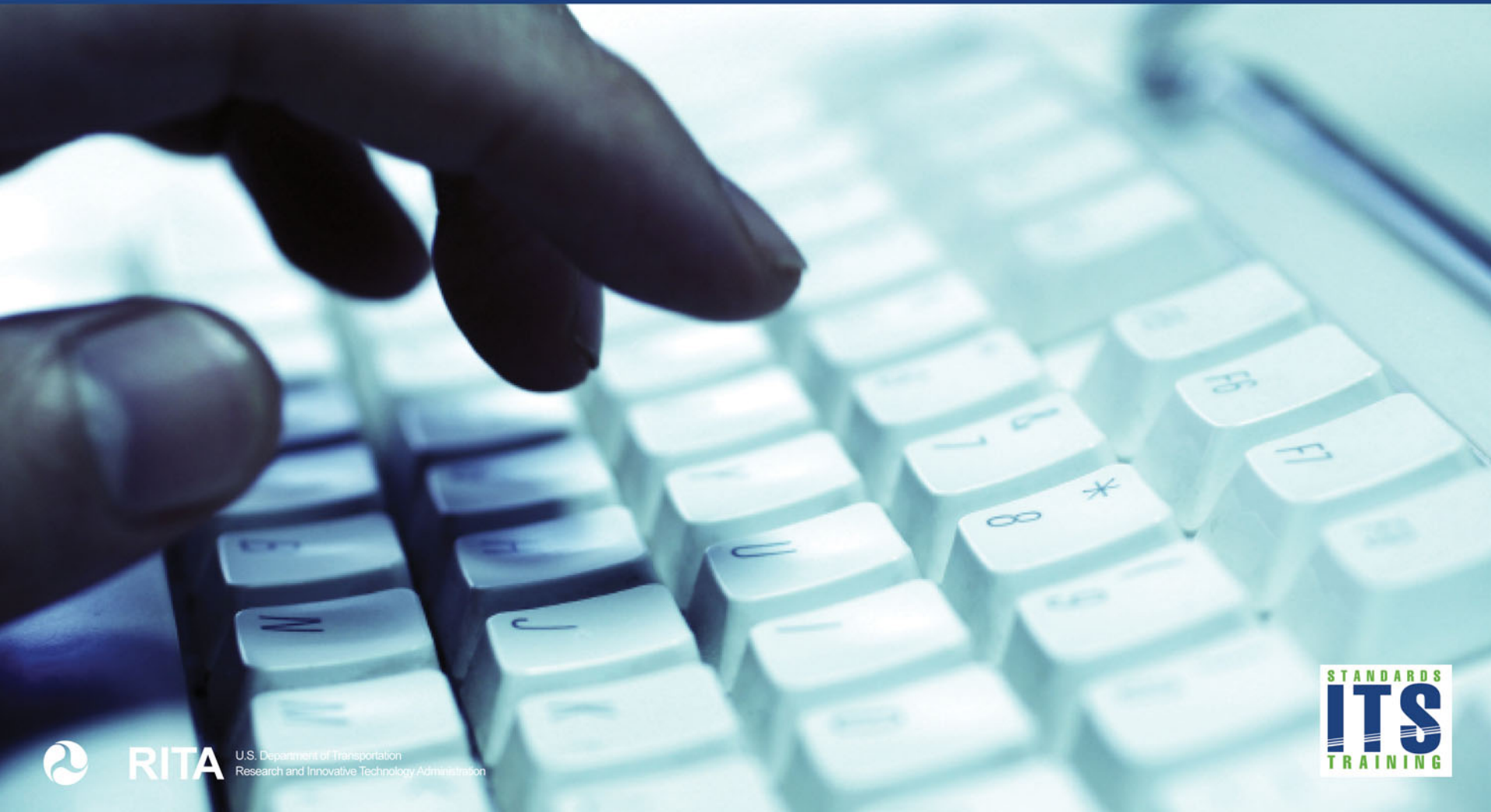

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STANDARDS ITS TRAINING

A317a: Understanding User Needs for CCTV Systems Based on NTCIP 1205 Standard

Instructor

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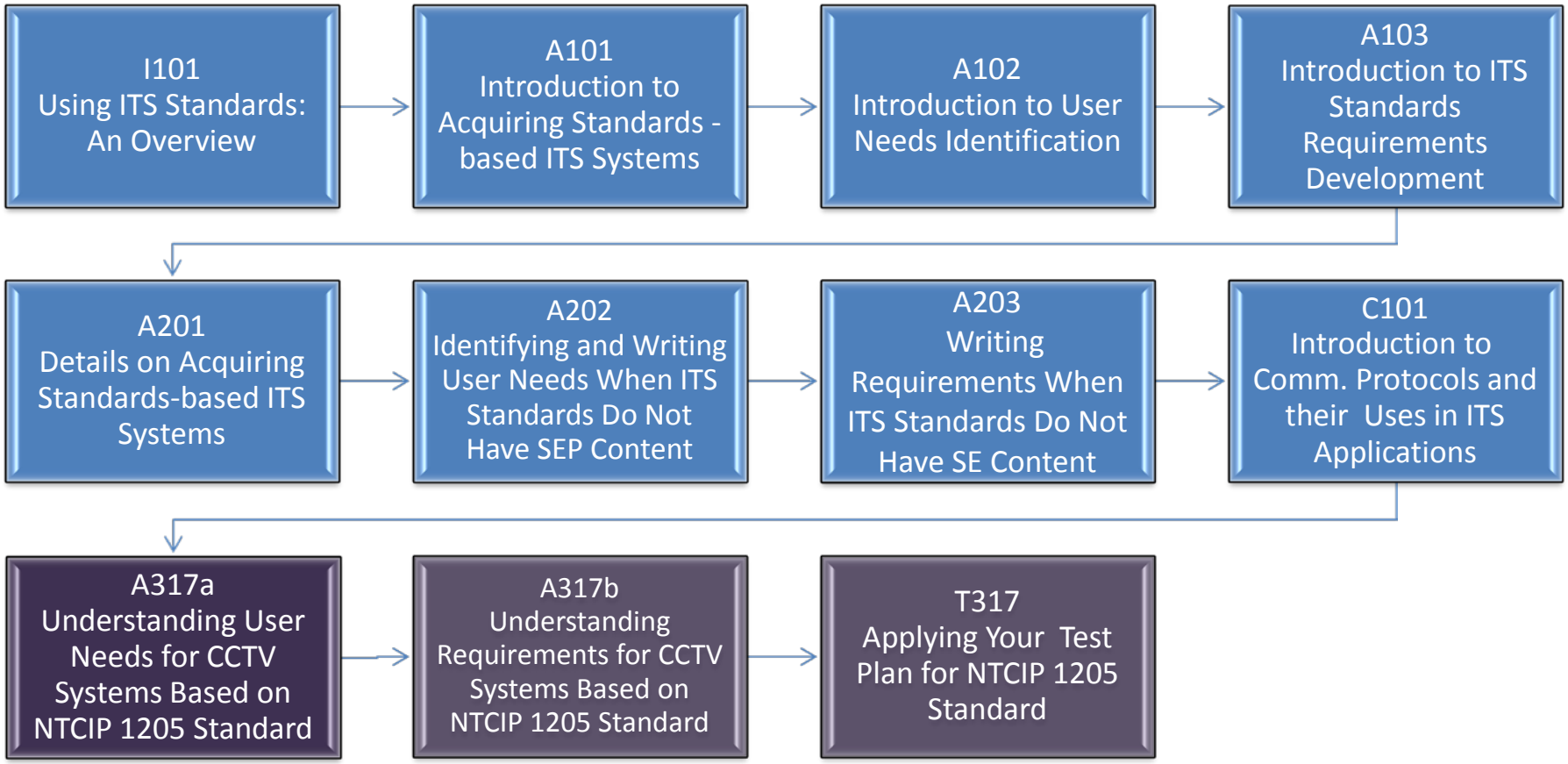
Target Audience

- Engineering staff
- Traffic Management Center (TMC)/operations staff
- System developers
- Private and public sector users
- Traveler and other information service providers

Recommended Prerequisite(s)

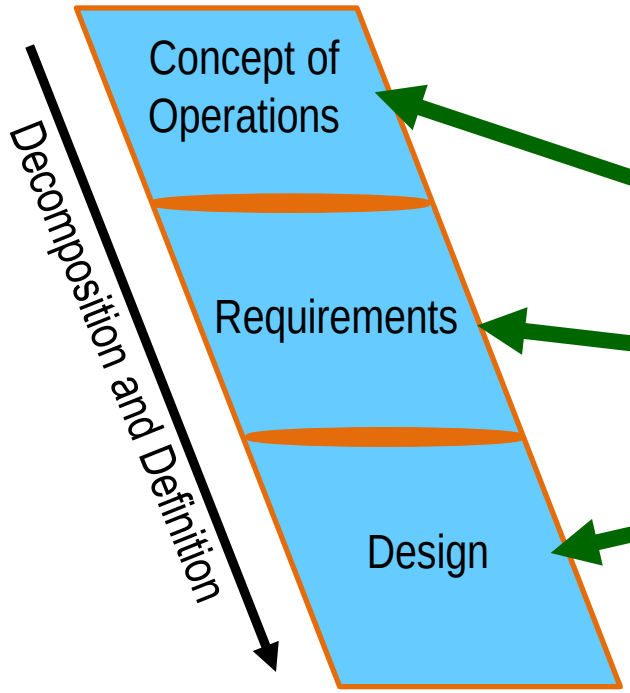
I101 Using ITS Standards: An Overview
A101 Introduction to Acquiring Standards-based ITS Systems
A102 Introduction to User Needs Identification
A103 Introduction to ITS Standards Requirements Development
A201 Details On Acquiring Standards-based ITS Systems
A202 Identifying and Writing User Needs When ITS Standards Do Not Have SEP Content
A203 Writing Requirements When ITS Standards Do Not Have SE Content
C101 Introduction to the Communications Protocols and their Uses in ITS Applications

Curriculum Path (Non-SEP)



SEP Content in ITS Standards Helps Identify User Needs and Requirements

Specification Development

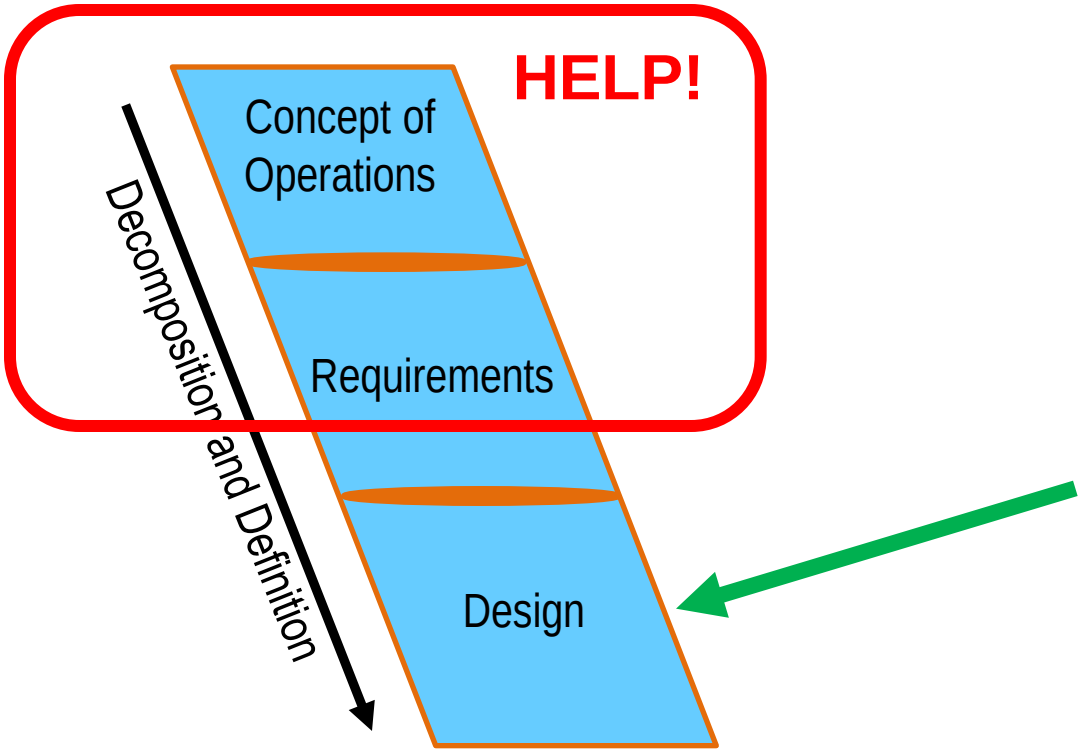


Typically they Provide

- **General**
- **Concept of Operations (User Needs)**
- **Requirements**
- **Design Details**
- **Annexes**

Non-SEP Based ITS Standards More Difficult to Use

Specification Development



Typically they only Provide

- **Overview**
- **General Information**
- **Design Details**

Learning Objectives

1. Review the structure of the NTCIP 1205 CCTV standard
2. Identify CCTV system-specific operational needs
3. Identify and write well-formed user needs for CCTV system
4. Evaluate conformance to the CCTV standard

Learning Objective #1 — Review the structure of the NTCIP 1205 CCTV standard

- Definition of a CCTV System
- The NTCIP Family of Standards
- Purpose of the NTCIP 1205 Standard
- Components of the NTCIP 1205 Standard
- What is offered by the standard?
- What is not offered by the standard? What users must do?

Definition of a Closed Circuit Television (CCTV) System

- Closed Circuit Television (CCTV) is defined as an installation of directly connected cameras creating a circuit that cannot be viewed by anybody outside of this circuit
- CCTV System is defined as one that includes a closed circuit, camera unit(s), monitoring station, and video display wall

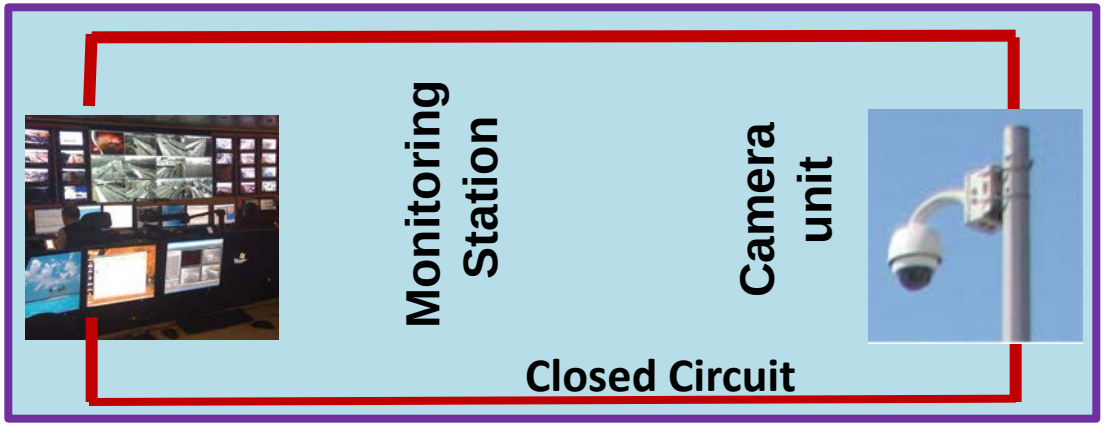


Photo Source: NYSDOT

Components of a CCTV System (Typical)

Central Location

- Monitoring Station
- Video Wall
- Video Switching Device

Source: NYSDOT

Field Location

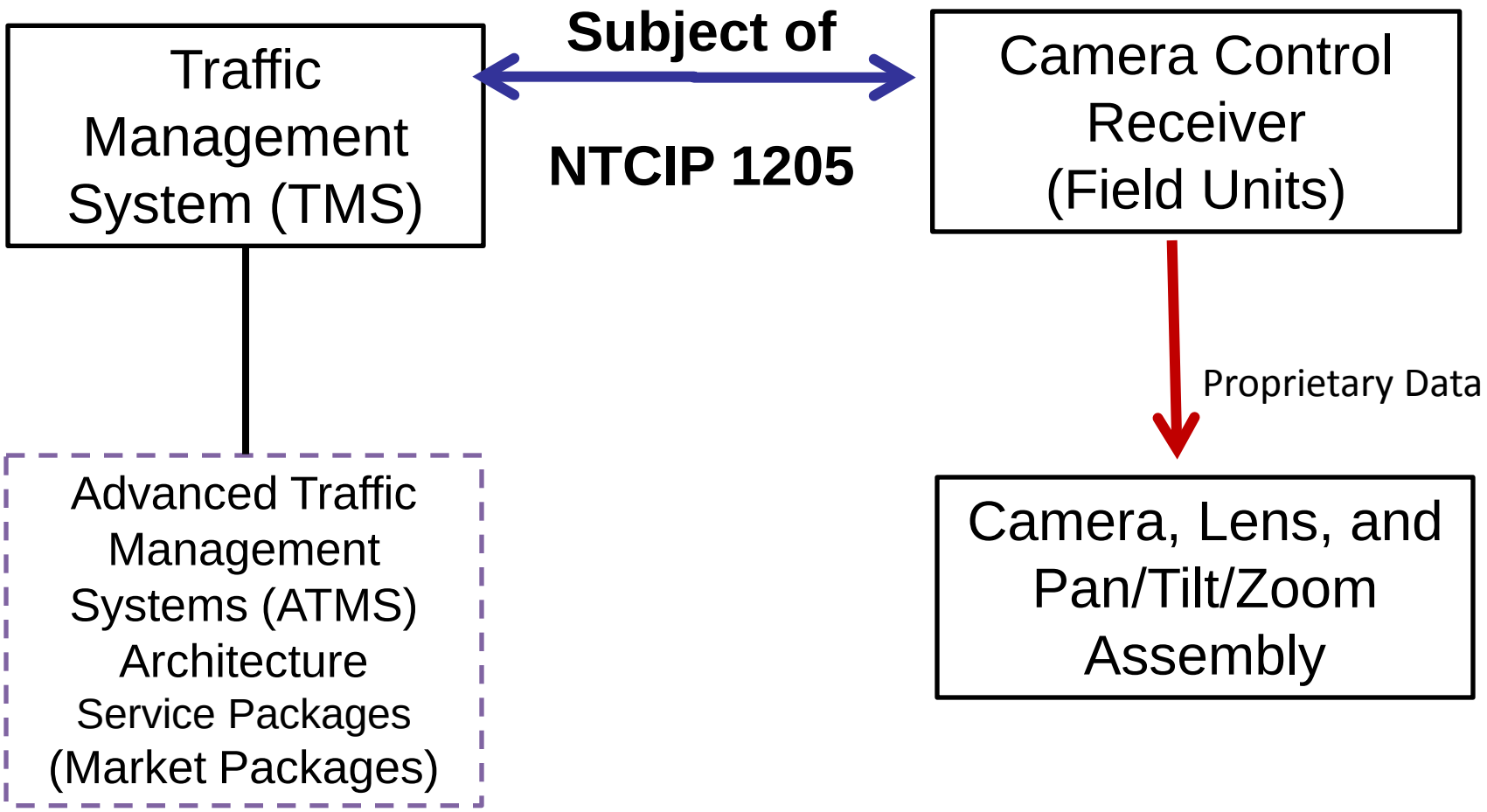
- Cameras with Lens
- Pan/Tilt Assembly
- Receiver

Source: NYSDOT

Communications

- Leased circuits
- Shared network

Camera Control Architecture



Source: NTCIP 1205 CCTV Standard, page 2-6, partial content shown

Camera Control Terminology

See Student Supplement for Definitions

1. Camera
2. Camera Lens
3. Camera Control Receiver (Unit)
4. Analog camera
5. Digital camera
6. Decoder
7. Pan-Tilt-Zoom
8. IRIS
9. Auto-Focus
10. Zones
11. Presets
12. Labeling

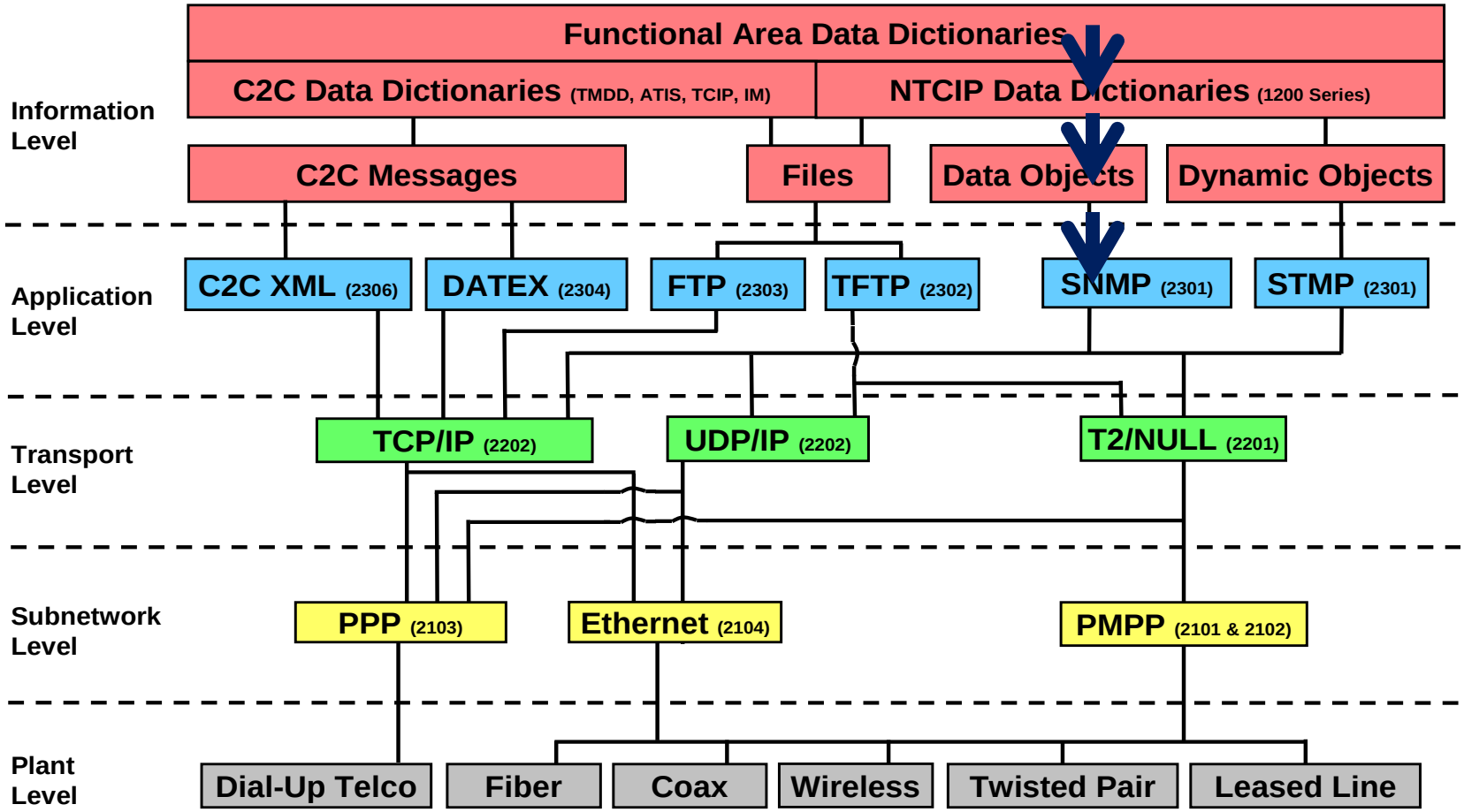
NTCIP Family

- NTCIP: a family of standards for the ITS industry
  - Information Level standards relate to data to be exchanged
  - Underlying protocol standards relate to how data is exchanged

- NTCIP 1205 CCTV standard is an Information Level standard that supports CCTV system for traffic management applications

NTCIP Framework

NTCIP 1201 Global Objects
NTCIP 1205 CCTV Camera Control



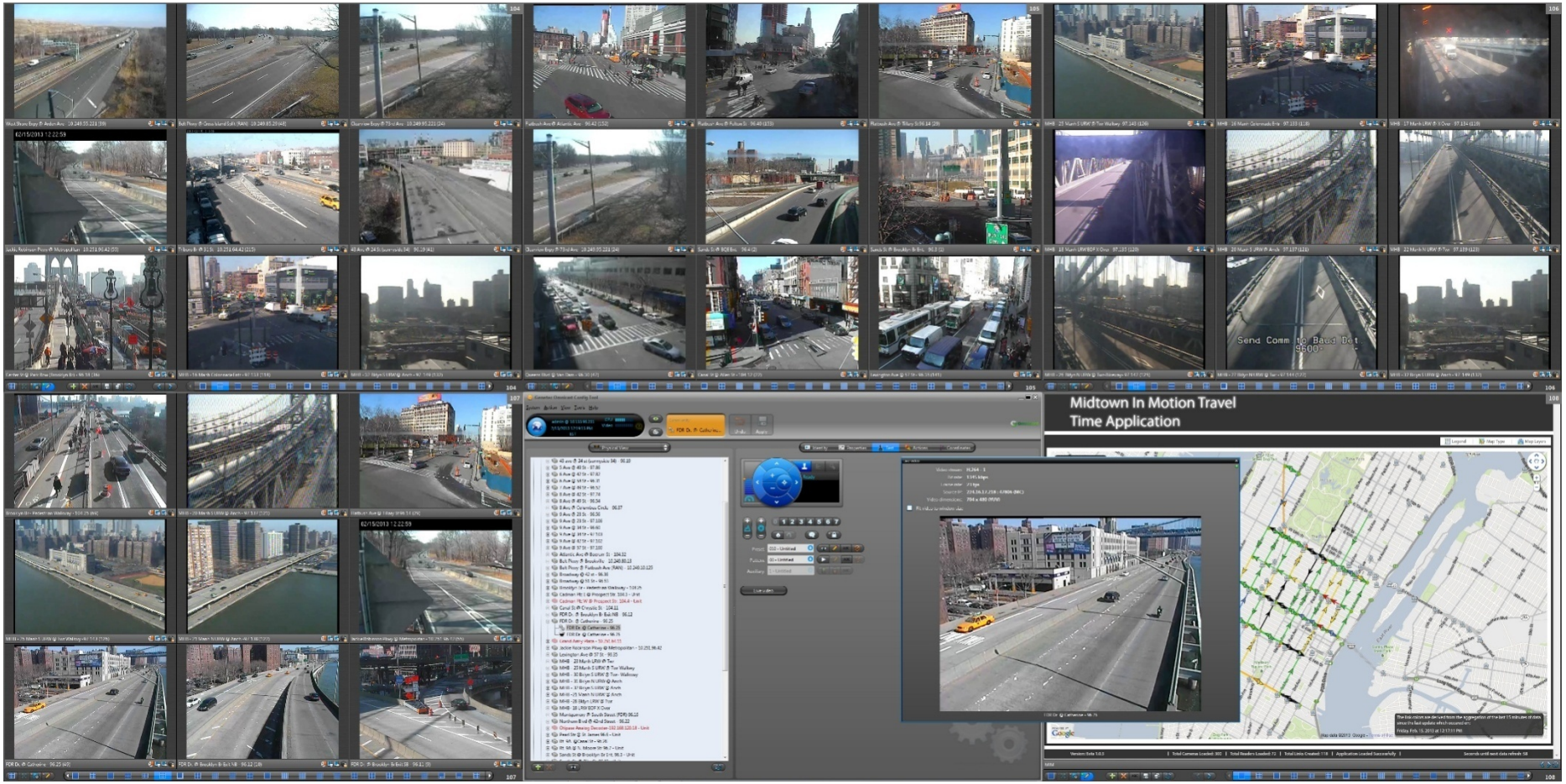
Source: NTCIP Guide

Purpose of the NTCIP 1205 CCTV Standard

- To support the overall traffic management operational needs the standard provides CCTV objects (data) definitions for **remote capability** for:
  - **Configuring** the CCTV device
  - **Monitoring** the CCTV device operation
  - **Controlling** camera position, auto-focus of the lens, Iris, and other functions
  - **Retrieving** images-data (Live data and Off-line Logged data)

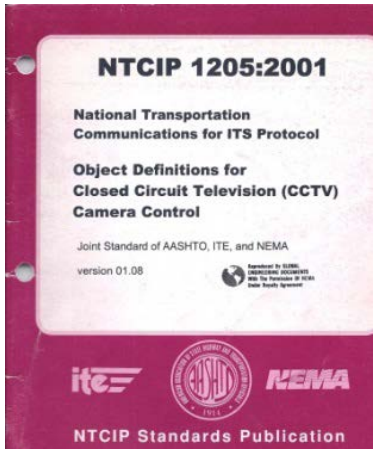
Example: CCTV System Operation

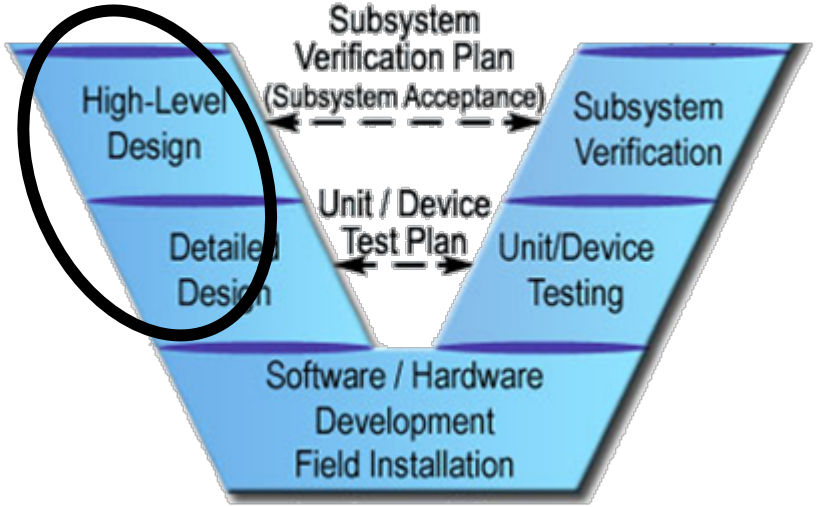
System Operator Obtains Detailed Information of an Area with the Remote Control Capability and Uses that Information to Determine Response



Source: NYCDOT-TMS

Where and How NTCIP 1205 fits into CCTV System Procurement





Standard does NOT provide user needs and requirements; only design solutions

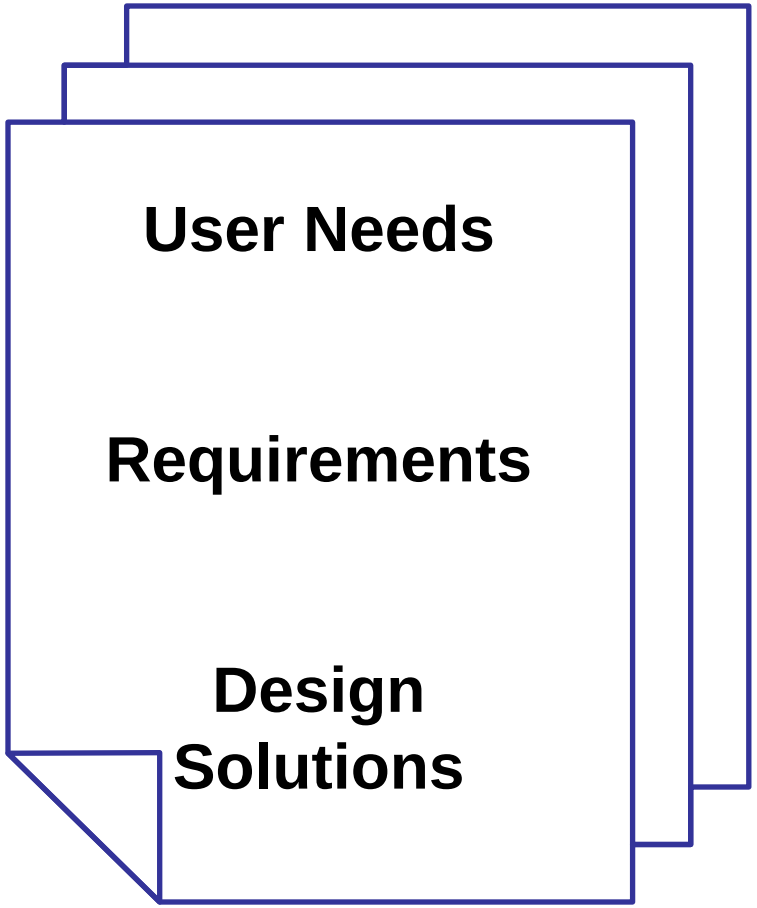
CCTV System Project Specifications

What Should be in a CCTV Specification?

Identify and write description of what the interface must do to support operations (features-functions)

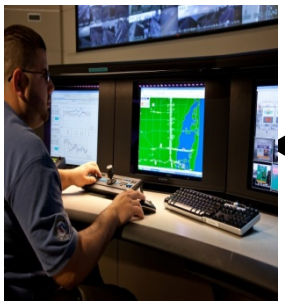
Develop and Write (in "*shall*" language) specific functional requirements to satisfy user needs

Map standard-supplied design concepts-solutions (objects) to fulfill the project requirements



Benefits of NTCIP 1205 CCTV Standard

Facilitates ITS deployments, eliminates need for proprietary solutions



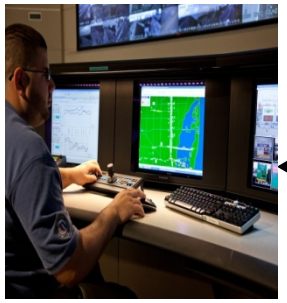
Source: FDOT-Katz

Easier System Expansion

Remote Management Capability

Consistent control interface with the central systems, allowing more cameras

Benefits of NTCIP 1205 CCTV Standard (cont.)



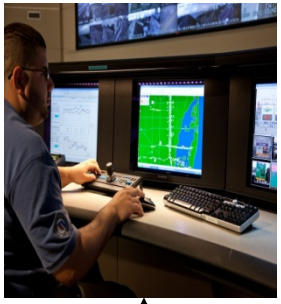
Benefit of Industry Standard (ITS)

Multiple Vendors Competitive Market

Establishes a common understanding of ITS CCTV system features

Agencies originate needs, developers build ITS systems, and vendors supply products, all are beneficiaries

The Outcomes: Compatibility, Interoperability, and Interchangeability



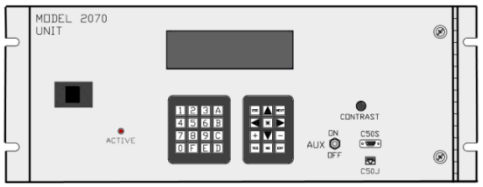
Interoperability

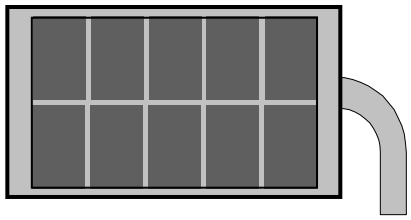
Interchangeability

NTCIP

Compatibility

Old Standard Camera





New Dome Digital Camera

Structure of the NTCIP 1205 CCTV Standard

These sections provide general information about a CCTV system

Section 1 CCTV Overview

- Benefits
- CCTV system

Section 2 General

- References, Terms

Annex A Extended Glossary

Structure of the NTCIP 1205 CCTV Standard

These sections provide CCTV system design solutions:

Section 3 CCTV MIB

- Management Information Base lists CCTV objects by functions they serve

Section 4 Conformance

- Lists Conformance Groups and Conformance Statement

What is offered by the NTCIP 1205 standard?

Current standard offers the following:

1. A single design for each of the anticipated user needs related to the camera operation

2. Management Information Base (MIB) contains object definitions to support undocumented user needs

What is offered by the NTCIP 1205 standard? (cont.)

3. Standard defines a ***Conformance Group*** (CG) as a grouping of related objects to perform a function or functions:

   - CCTV Configuration
   - Extended Functions
   - Motion Control
   - On-Screen Menu-Control

4. Standard contains the ***Conformance Statement*** to evaluate conformance to the NTCIP 1205 standard and some cases to the NTCIP 1201 standard.

What is not offered by the NTCIP 1205 Standard?

- Standard does not define user needs and their associated requirements to the NTCIP 1205 design
- Agencies must first identify and then write user needs for the acquisition process
- Lack of documented user needs in the specification may lead to “guess-work” and affect interoperability and vendor-independence

What is not offered by the NTCIP 1205 standard? (cont.)

- Video formats to facilitate transmission and storage of images are NOT covered by the standard.
  - Industry (and Internet) based standards are used:

  Examples:
  - MPEG-4 (Moving Pictures Expert Group)
  - H.264 (AVC-Advanced Video Coding): video conferencing
  - ONVF (Open Network Video Interface Forum): IP video

- Agency CCTV specification must include required formats. (More in Supplement and A317b Module)

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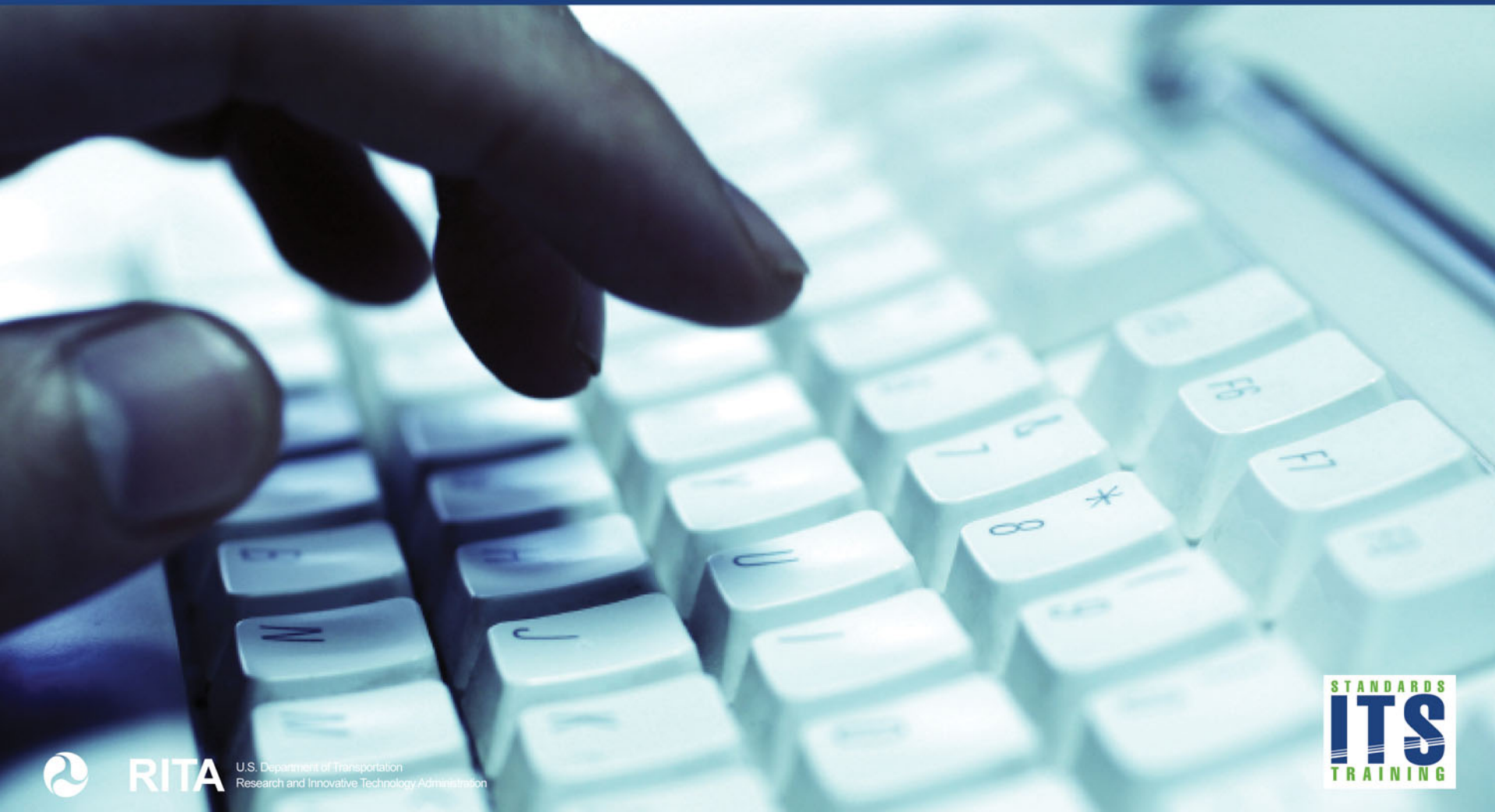

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Which of the following applies to the NTCIP 1205 standard?

Answer Choices

a) Supports video signal compressions formats
b) Provides CCTV system design objects
c) Provides documented CCTV user needs
d) Provides documented CCTV requirements

Review of answers

a) Supports video signal compressions formats

Incorrect, because video signal compression formats such as H264 and ONVF are supported by the Internet and industry standards, not by NTCIP.

b) Provides CCTV system design objects

Correct, because standard does provide objects.

c) Provides documented CCTV user needs

Incorrect, because CCTV user needs are not documented by NTCIP 1205 standard.

d) Provides documented CCTV requirements

Incorrect, because CCTV requirements are not documented by NTCIP 1205 standard.

Summary of Learning Objective #1

Understand the structure of the NTCIP 1205 CCTV standard

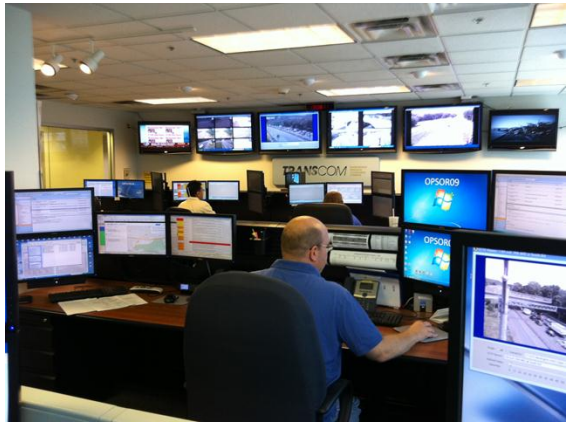
- Defined a CCTV system
- Reviewed the NTCIP family of standards and benefits
- Reviewed the structure of the NTCIP 1205 and key components
- Realize that CCTV system user needs are not documented and we must identify and write them
- Know that video formats are needed but they are not covered by this standard

Learning Objective #2 — Identify CCTV Specific Operational Needs

- What are your operational needs?
- How does the CCTV standard cover operational needs for traffic management applications?

CCTV-Specific Operational Needs

- Concept of Operations (ConOps) Reveals the "Big Picture"
  - Who are the stakeholders?
  - What are the operational scenarios?
  - What are the user needs?
  - Are there any regional aspects?
  - We have discussed ConOps in Module A202

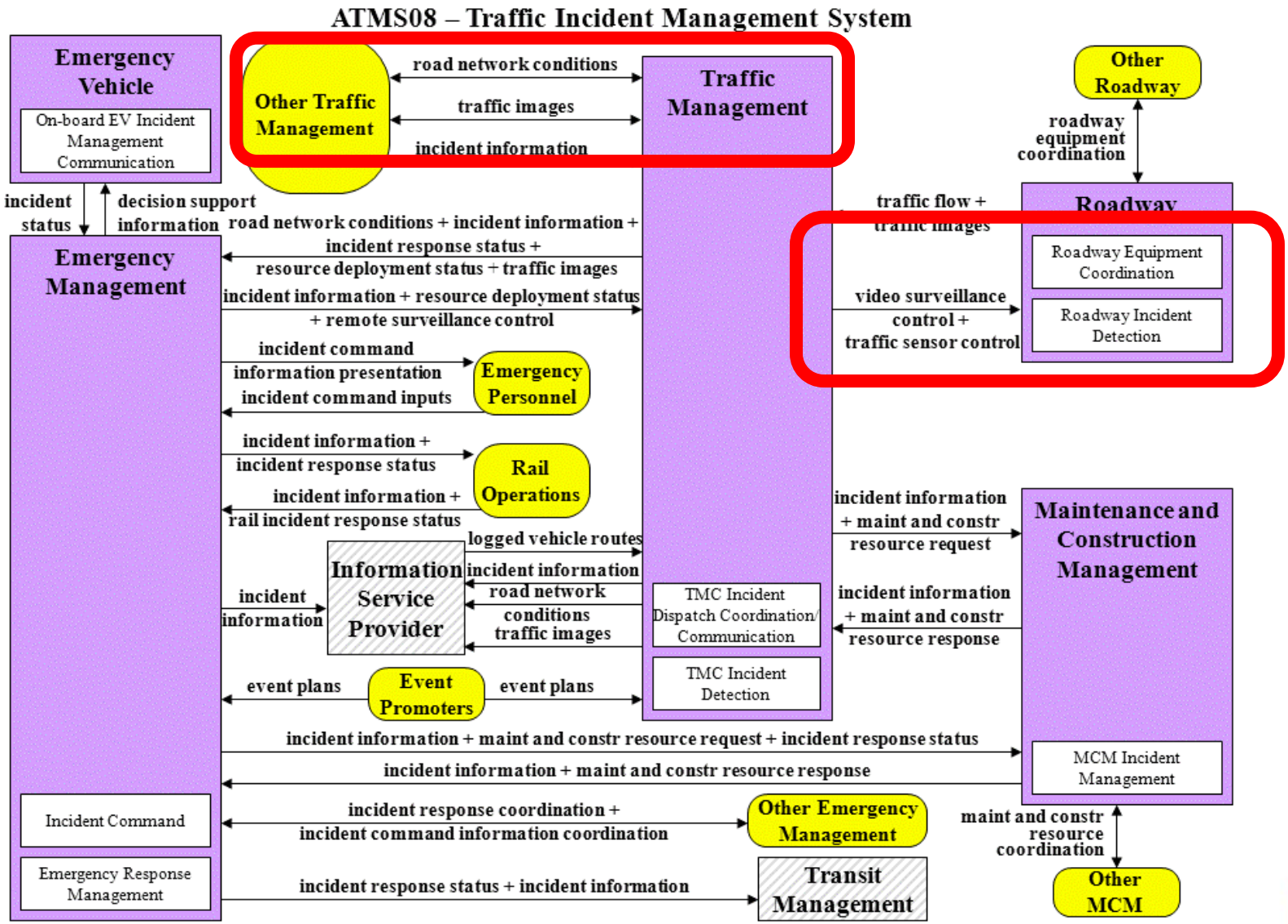


Source: Transcom

CCTV-Specific Operational Needs (cont.)

- Institutional Policies
  - Policy on sharing video images with regional partners or private sector service providers (video feeds)
  - Shared control of cameras with pre-assigned priorities, an aspect of regional architecture
  - Service (Market) packages from regional architecture may require specific video surveillance capabilities:
    -"Roadway Subsystem" and "Security Monitoring Subsystem"

Illustration: Video Surveillance



Example: Common Purpose and Shared Cameras and Control

- Traffic and emergency management centers through mutual agreements share each others camera images and may control cameras within a jurisdiction for traffic and emergency coordination.

Source: Transcom

CCTV-Specific Operational Needs (cont.)

- General Purposes of CCTV Systems:
  - Traffic surveillance
  - Congestion monitoring
  - Incident detection and verification
  - Public/media information
  - Managing weather/disaster emergency
  - Infrastructure security

What does Caltrans use the CCTV for?

"*The primary uses for the cameras are:*

*(1) To provide **motorists** visual verification of weather and traffic conditions to make informed travel decisions.*

*(2) To provide **Caltrans** visual information to improve response to traffic and/or weather related incidents on the highways."*

Source: Frequently Asked Questions
http://www.dot.ca.gov/dist2/cctv/faqs.htm

Example: Perspective on CCTV Operations

Virginia Department of Transportation Vision for CCTV

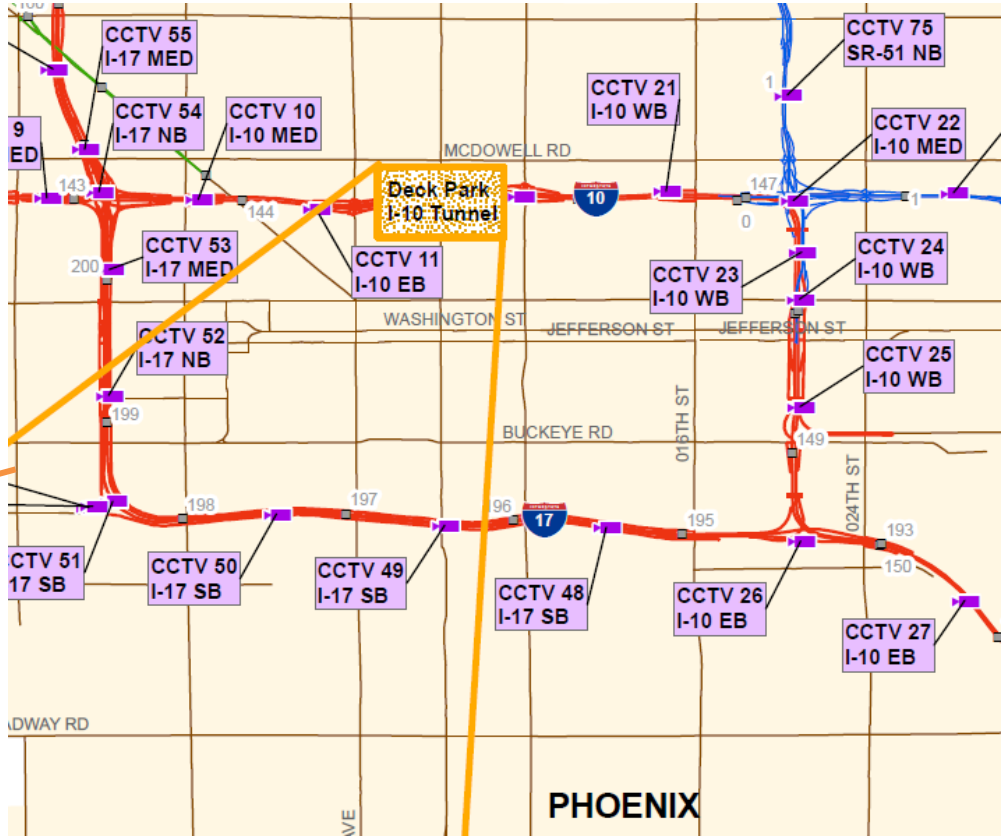
.....Camera System will provide Traffic Management Center (TMC) operators with the ability to detect incidents, verify incident information, and monitor traffic conditions on VDOT roadways. CCTV images will be shared with regional and statewide stakeholders to improve interagency coordination. Additionally video images depicting real-time roadway conditions will be available to the motoring public.

Source: *VDOT Northern Region Operations CCTV Concept of Operations*

Example: Operational Need
Verify Traffic Conditions-Normal Operation

Observing "*what is happening*" in real-time

I-10 Tunnel, AZ



Images: Arizona Department of Transportation

Example: Multi-Agencies' Visual System

Simultaneous real-time viewing of images aids agencies to prepare a coordinated response

Specifically, detailed-zoomed information helps each agency decide what to do.

Source: New York State Department of Transportation

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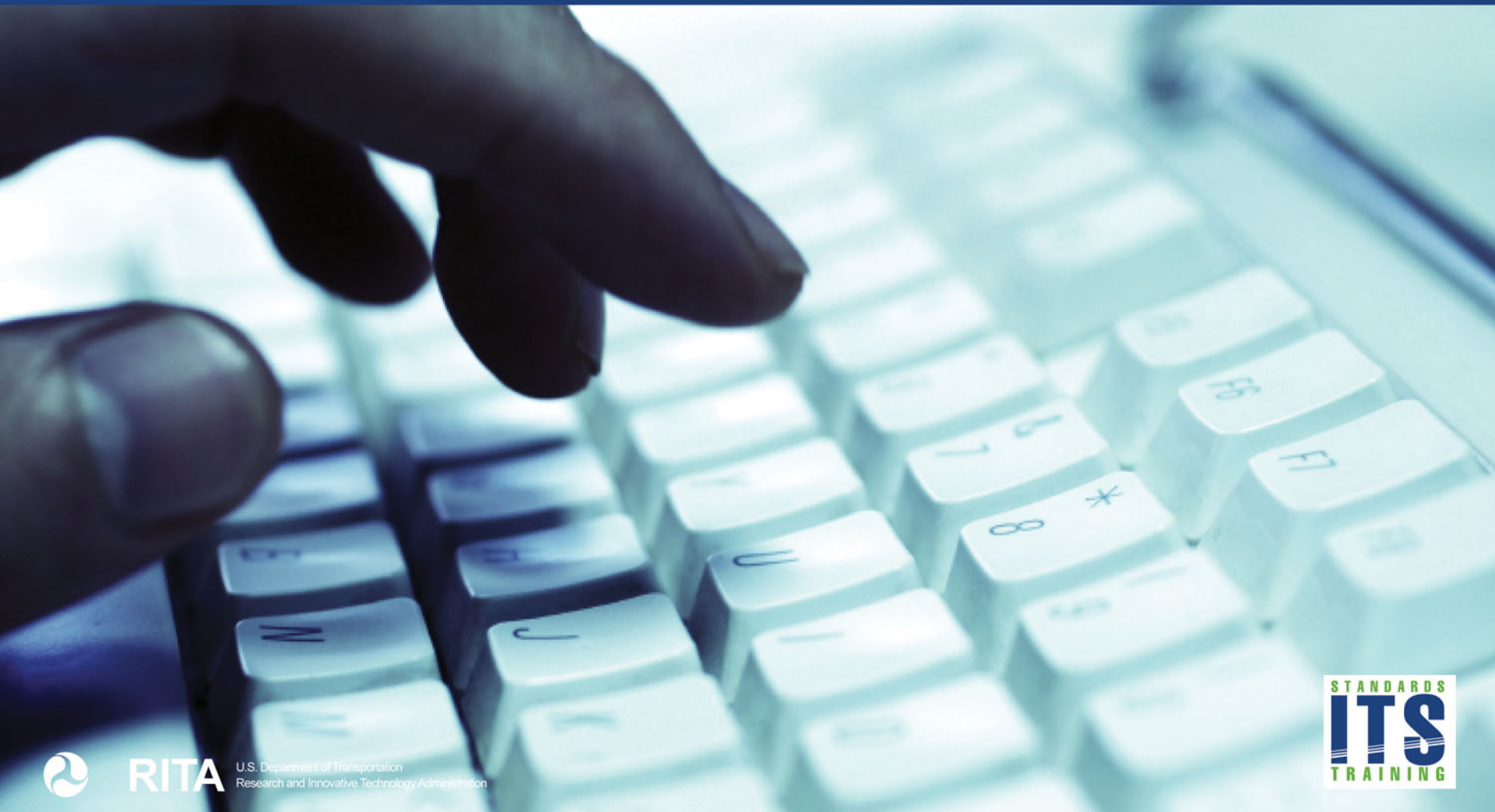

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Which of the following is NOT a true statement related to traffic management?

Answer Choices

a) TMC typically performs assessment of traffic conditions
b) TMC typically shares incident information with other centers in the region
c) TMC does not share camera images with the public either indirectly or through travel information
d) Operational needs are part of the ConOps

Review of answers

a) TMC typically performs assessment of traffic conditions

Incorrect, because the statement is true.

b) TMC typically gathers detailed information during an accident

Incorrect, because the statement is true.

c) TMC does not share camera images with the public either indirectly or through travel information

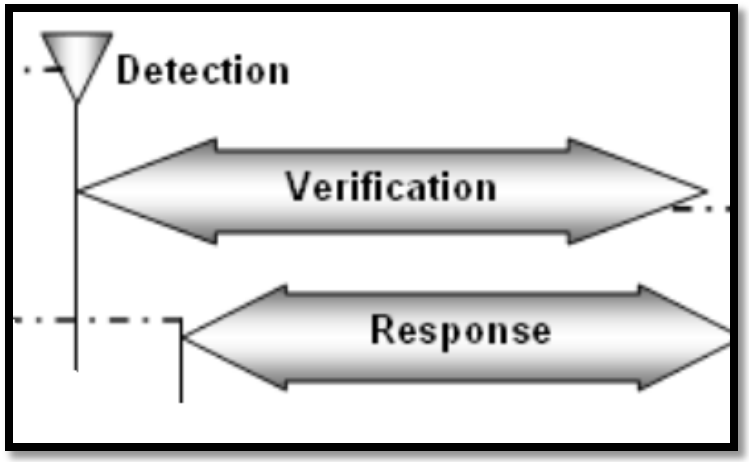
***Correct, agencies do share camera images with the public directly on the Internet or through travel information*.**

d) Operational needs are part of the ConOps

Incorrect, the statement is true.

Example: Incident Verification with Camera

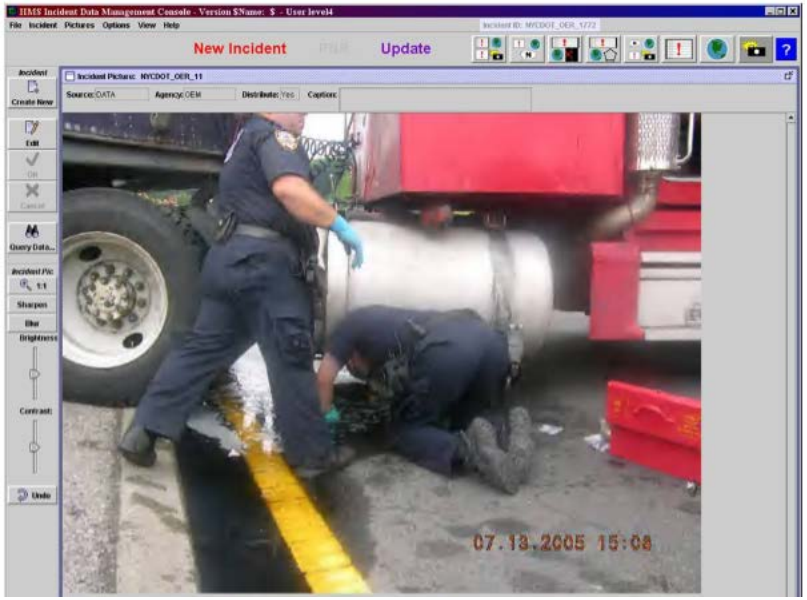
- TMC needs to **first verify** an incident in order to ensure that the incident is real and confirm reported conditions at the location, prior to response.



Source: FHWA IM Handbook 2000

Example: Archiving Video Images for Research and Training

- Agency gathers video images obtained during major emergencies and make them available (archived) for incident research studies and training exercises to improve standard operating procedures (SOPs)



Source: NYPD

Example: Sharing Live Video Images with the Public

- Agencies do share video images with the public either "live" or post at a web site for retrieval, within the stated policy.

Source: Caltran

NTCIP 1205 CCTV Standard Supports Operational Needs

- Standard supports the communications interface with the CCTV system by providing “objects” and deploying underlying protocols to exchange data.
- Learning from the other standards, we have identified generic user needs applicable to CCTV system operational environment:
  - Live data exchange with cameras
  - Off-line data retrieval from cameras

Live Data Exchange with CCTV Standard

- Live data exchange with the camera control unit and data requests:
  - Configure a CCTV device (parameters)
  - Monitor a CCTV device (conditions)
  - Control a camera control unit (functions, positioning etc.)

Off-Line Data Exchange with CCTV Standard

- Off-line (Logged) Data Exchange:
  - Addresses operational environments without always-on connections (e.g., loss of communication to a camera)
  - Define conditions to place data into a log (e.g. Dome cameras-IP network cameras)
  - Logging is important for situations without communications or when recording intermittent data

Summary of Learning Objective #2

Identify CCTV Specific Operational Needs

- Reviewed CCTV-specific operational needs
- Reviewed the standard's support in traffic management operations by providing remote management of field devices and controls

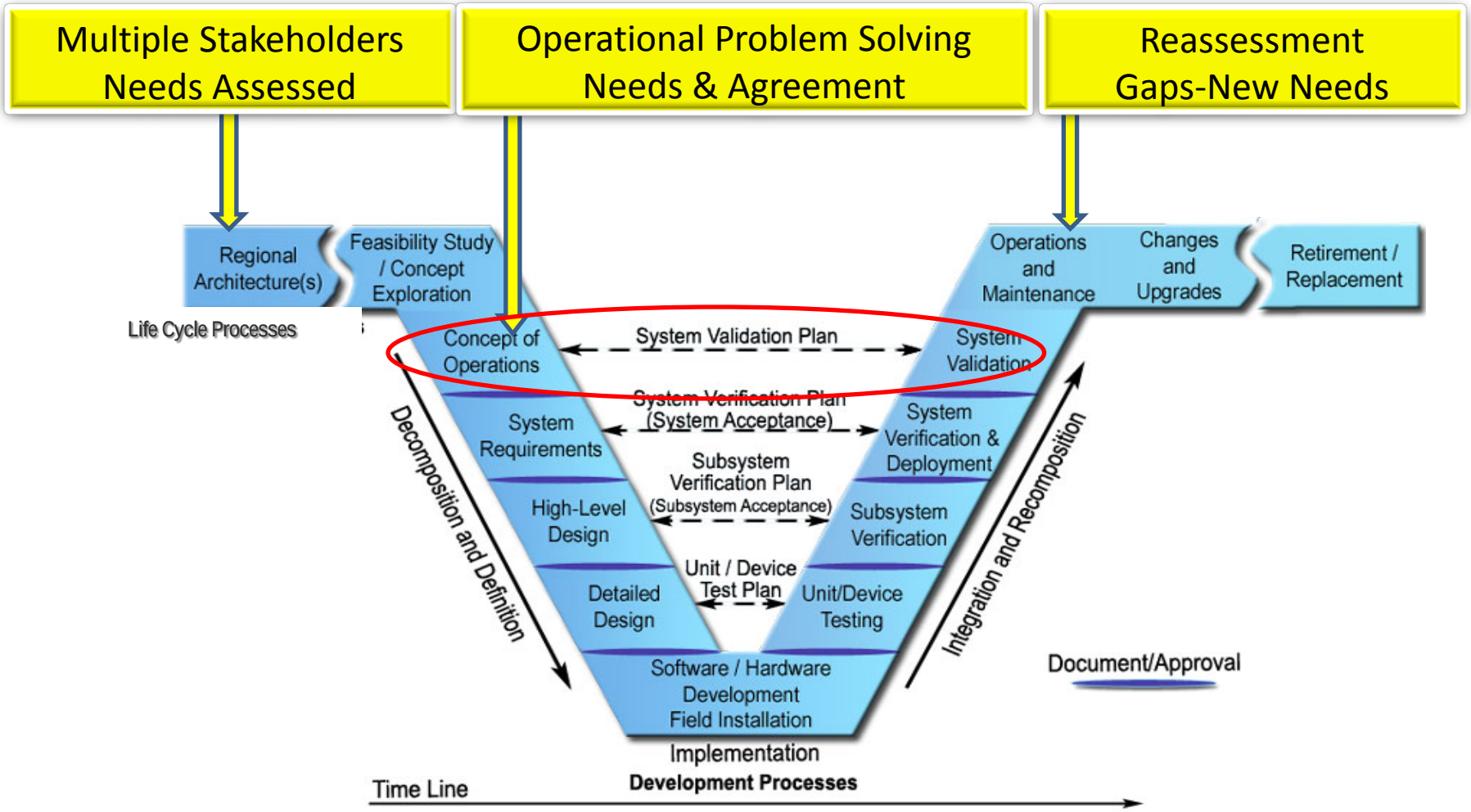
Learning Objective #3 — Identify and Write Well-Formed User Needs for a CCTV System

- How to identify major desired capabilities
- How to use the generic Extraction Process to derive user needs from the NTCIP 1205 standard
- Write well-formed CCTV user needs

What is a User Need?

- Describes the **major desired capability (MDC)** and captures its intent.
- Addresses the question: "*Why is this capability operationally important to the user?*"
- A system should not be procured or built without first knowing what the system is expected to do and the problem it addresses.
- User needs help to assess/validate if a system does what the user wants it to do.

Identifying User Needs Locations on "V" Model



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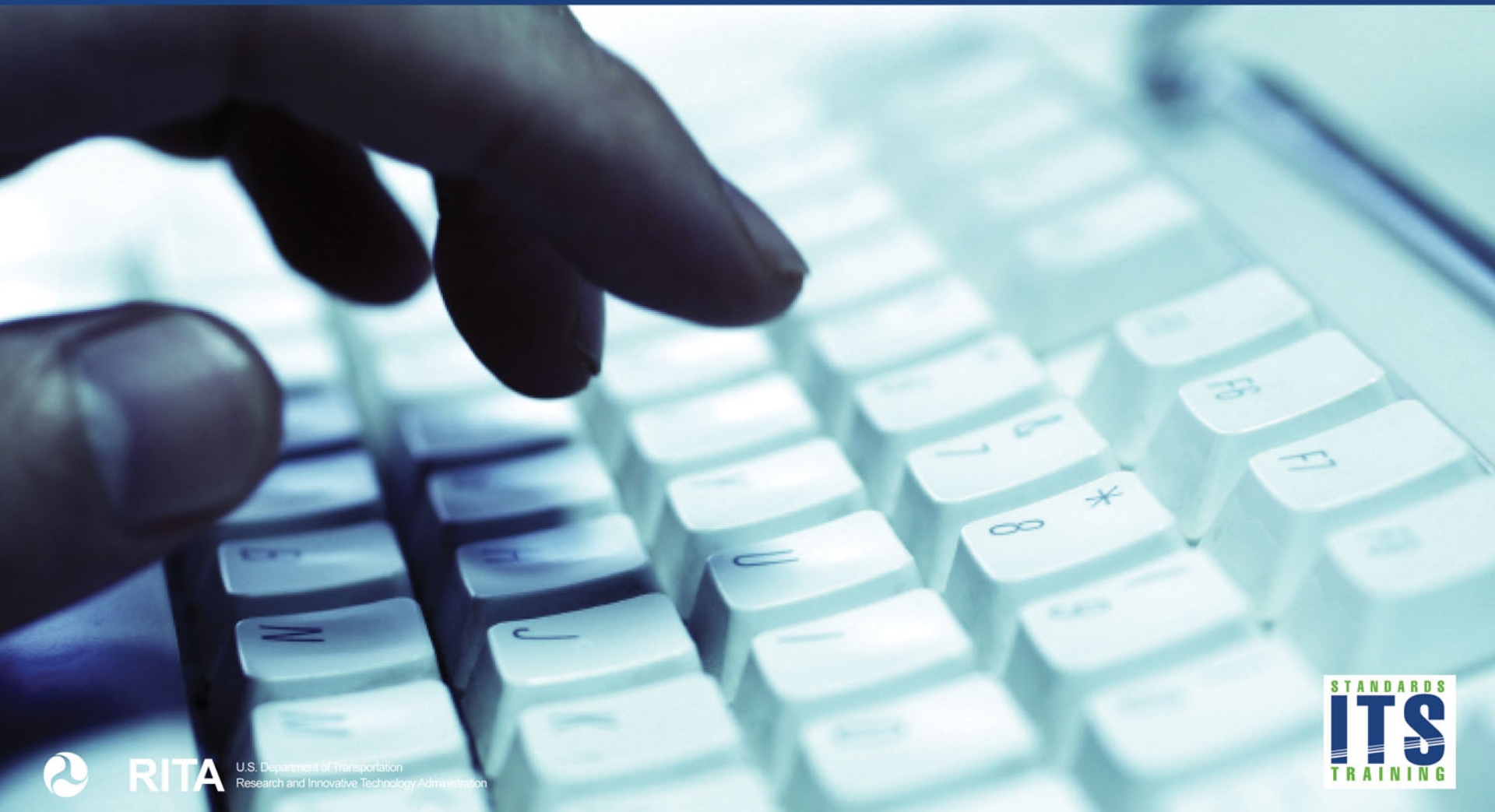

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The NTCIP 1205 CCTV standard does not provide the documented user needs for the acquisition process.

What is the Best Source of User Needs?

Answer Choices

a) Traffic Management Concept of Operations
b) Regional ITS Architecture
c) Standard Documentation
d) All of the Above Sources

Review of answers

a) Traffic Management ConOps

Incorrect, because exploring the ConOps is an important source, but partially true.

b) Regional ITS Architecture

Incorrect, because architecture is a framework-only a partial source.

c) Standard Documentation

Incorrect, because standard offers ONLY design solutions, but not sufficient from users' perspective.

d) All of the Above Sources

Correct, because all of the above sources have links to user needs and assessment of each will ensure our purpose to identify user needs.

What is a Major Desired Capability (MDC)?

- What will be required from the system to address a user need?
  - Example: Pan-Tilt-Zoom (PTZ) is a major capability delivered by a CCTV system
- MDC can be extracted from the CCTV standard through Conformance Groups.

Extracting a Major Desired Capability from the CCTV Standard

READ

Conformance Groups

and CCTV MIB (70 objects)

1. CCTV Configuration
2. Extended Functions
3. Motion Control
4. On-screen Menu

RECOGNIZE

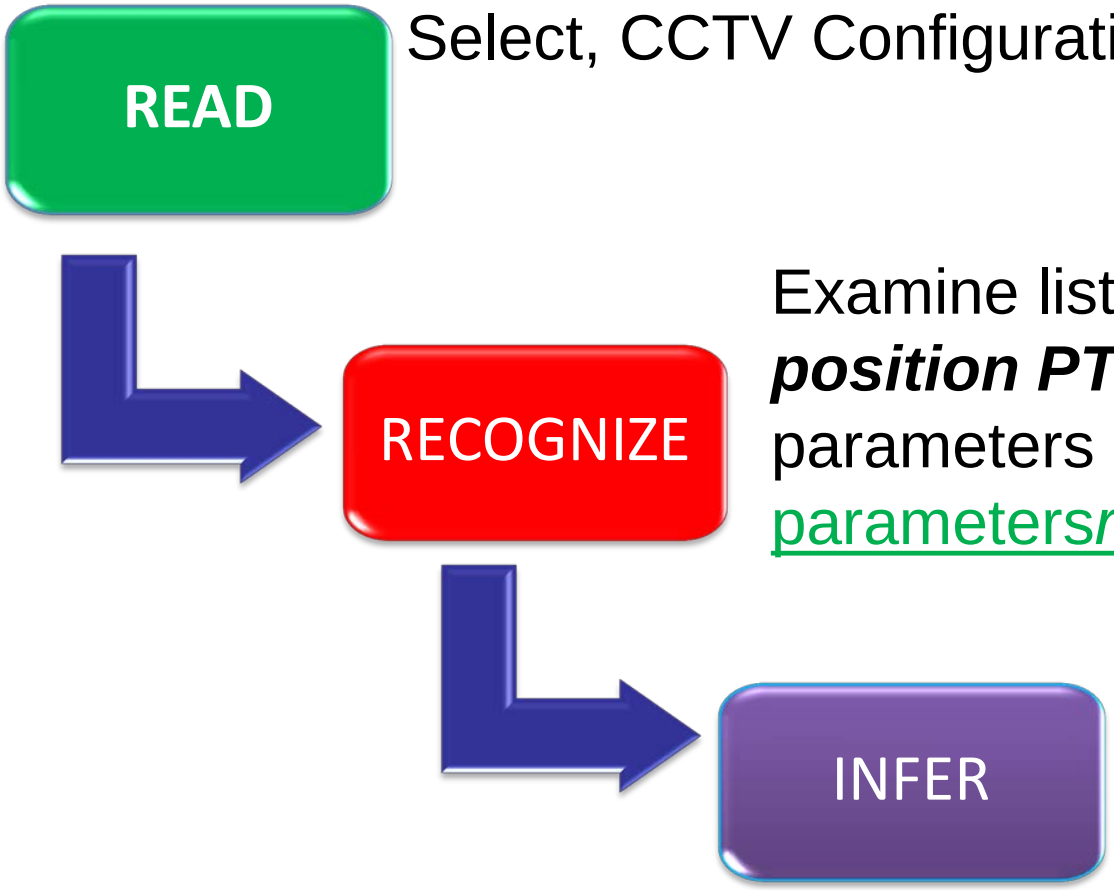
Categories of Functions they Represent

INFER

Major Desired Capability (MDC)

Write User Needs

Example: Extracting a Capability from the CCTV Configuration Conformance Group

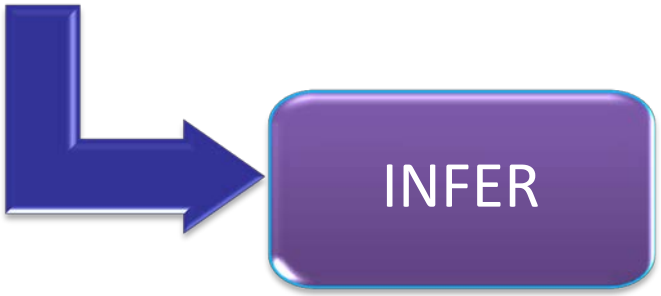


Example: Extracting a Capability from the Motion Control Conformance Group

READ Select, Motion Control Configuration Group

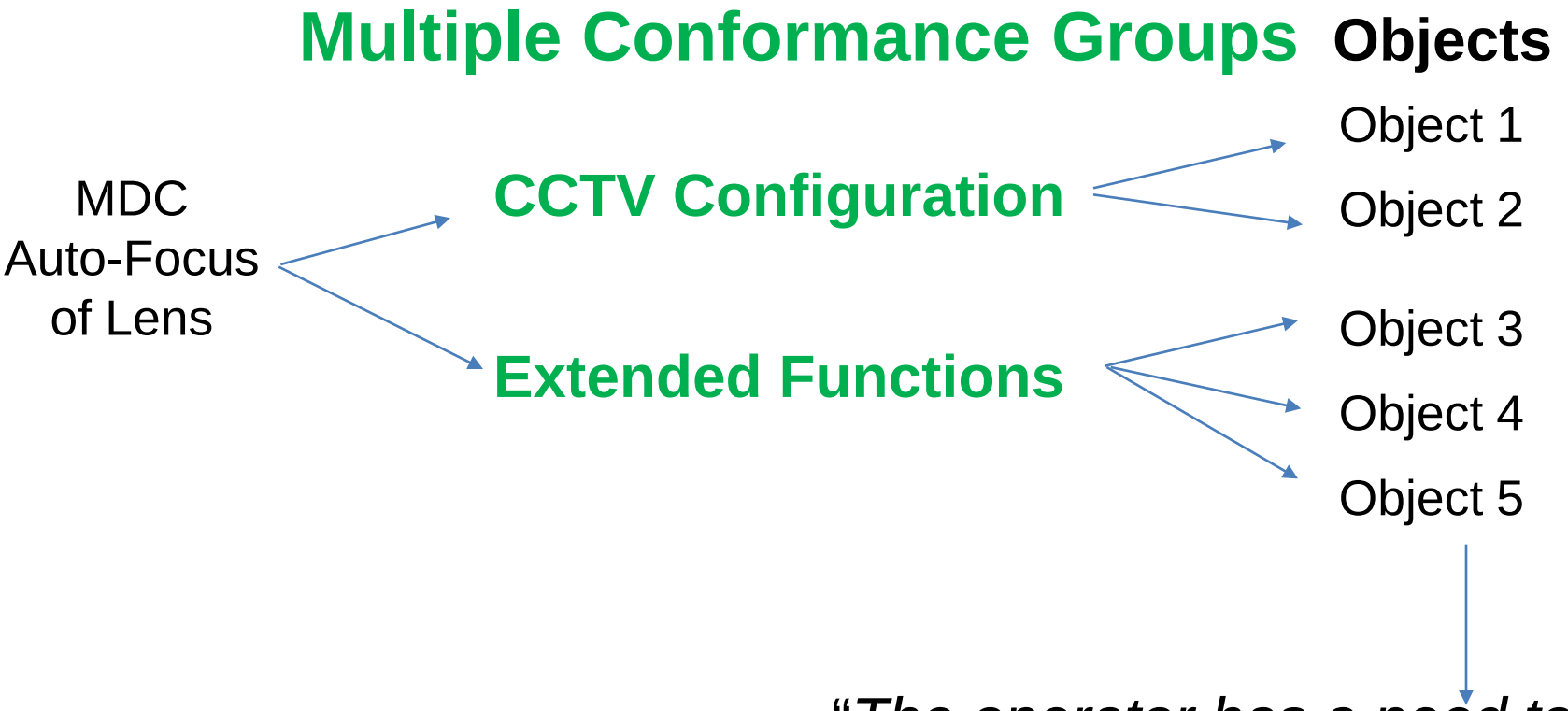
Examine listed objects for *listing of presets and position objects*

presetGotoPosition



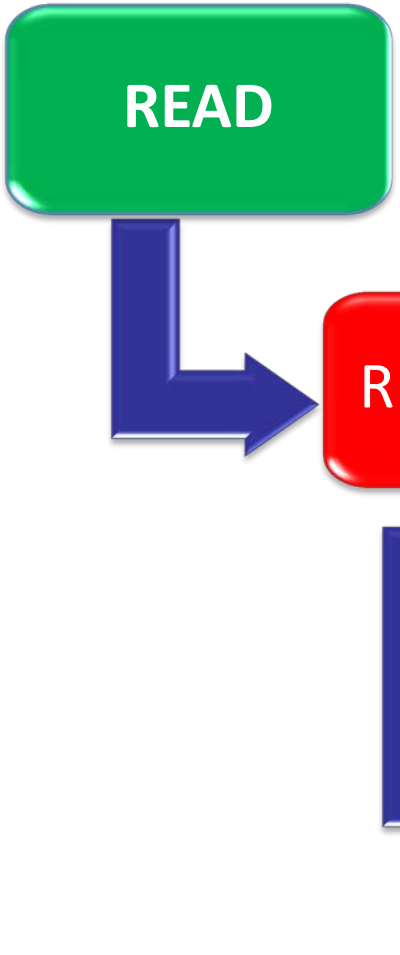
TMC Operator has a capability to jump to a camera position at a pre-selected location

Extracting a Major Desired Capability



*"The operator has a need to remotely adjust the **auto-focus of the camera lens**, status, and confirmation."*

Example of an MDC: "Auto-Focus"



Select, CCTV Configuration and Extended Functions Group

Examine Objects (5 required)

1. range**Focus**Limit
2. timeout**Focus**
3. system*Lens**Feature**Control*
4. system*Lens**Status***
5. *systemLens**Equiped***

MDC: Operator has a need to adjust lens for **near-far** view for details

Example: Exploring Conformance Groups for User Need

CCTV Configuration CG

- **rangeFocusLimit**
- **timeoutFocus**

Extended Functions CG

- ***systemLensFeatureControl***
- ***systemLensStatus***
- ***systemLensEquiped***

"TMC Operator has a need to focus camera automatically from near to far limits within 50-500 ms interval, activate-deactivate lens components, and check lens status and availability."

Writing a Well-Formed User Need

- **Criteria for Writing a Well-formed User Need**

1. Uniquely identifiable (Give it a structure)
2. Identifies one or more major desired capabilities (what functions-features)
3. Solution-free (don't get into a design)
4. Captures rationale (Why do we need it?)

Example: Need to Configure a CCTV Device

UN 1: Configure a CCTV Device

*A TMC operator with access to a management station has a **need to retrieve information** about the configuration of the CCTV device to properly communicate with the device. The controlling entity may also need to alter the configuration to produce expected operations.*

ID

MDC

Rationale

Solution-free

Example: Need to Share Video Images

UN-2: Need to Share Video Images

An agency has a need to share video images with regional stakeholders (state and local DOTs, police, fire and rescue) and upon request allow control of cameras to approved entities for interagency coordination needed during traffic and emergency management.

Uniquely Identifiable	Rationale	Major Desired Capability (MDC)	Solution-free

Example: Need to Control Camera

UN-3: Need to Control Camera in the Field

A TMC operator has a need to control and monitor cameras from main facility or backup TMC for gathering information in normal and emergency operations.

Example: Special Need-Camera Tour

UN-4: Need to Set-Up a Camera Tour

A TMC (supervisor-induced) has a need to enable a built-in "camera tour" automatically for multiple times during the day/night operation.

Example: Zones

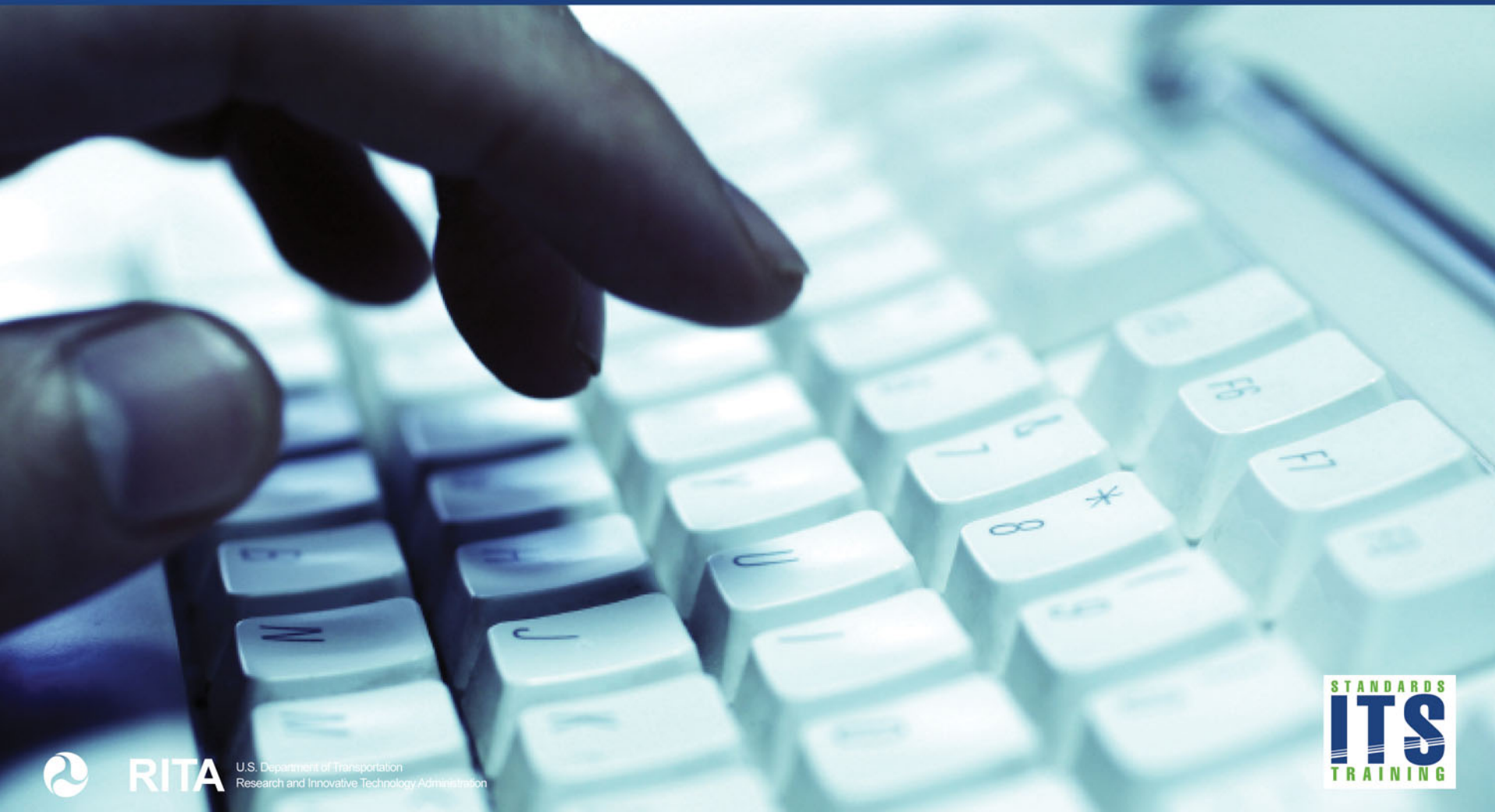
UN-5: Need to Set-Up Zones

An agency has a need to configure definable zones, within Pan-Tilt limits, identifiable with a pre-programed text message display to allow operator to gain overlapping view of a region.

C-Camera Location

Source: http://www1.honolulu.gov/cameras/pearlcity/index.htm

ACTIVITY



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Which of the following is a well-formed CCTV user need?

Answer Choices

a) The TMC operator has a need for 64 presets.
b) The CCTV system must allow for 0-360 degree Panning.
c) The CCTV system must provide for up to 100 labels.
d) The TMC operator has a need for monitoring current value of the temperature in the camera enclosure for proper operation.

Review of answers

a) The TMC operator has a need for 64 presets.
Incorrect, because 64 presets is a specific requirement-a solution.

b) The CCTV system must allow for 0-360 degree Panning.
Incorrect, because it contains a specific range of solution and lacks rationale.

c) The CCTV system must provide for up to 100 labels.
Incorrect, because it contains a specific range of solution-a requirement.

d) The TMC operator has a need for monitoring current value of the temperature in the camera enclosure for proper operation
Correct, because it contains MDC, has a rationale and it is solution free.

Summary of Learning Objective #3

Identify and Write Well-Formed User Needs for CCTV System

- Reviewed the process to identify major desired capabilities
- Generic Extraction Process to derive user needs from the NTCIP 1205 standard is reviewed
- Discussed the criteria for writing a well-formed CCTV user need and some examples

Learning Objective #4 — Evaluate conformance to the CCTV standard

- What are the minimum conformance requirements?

Conformance Group

- Conformance group (CG) is a basic unit of conformance to the CCTV standard
- CG is either **Mandatory** or **Optional**
- Section 4 of the NTCIP 1205, provides summary of the support conformance requirements (page 4-1)

Conformance Statement

- Lists Required Conformance Groups

Conformance Group	Conformance Requirement
NTCIP 1205 v01	
CCTV Configuration	**Mandatory**
Extended Functions	Optional
Motion Control	Optional
On-screen Menu Control	Optional
NTCIP 1201 v03.15 has Global Objects Definitions	Some objects are made **Mandatory**

Evaluating Conformance to NTCIP 1205 Standard

- Conformance Statement Guides which CGs are to be selected by the project:
  - **Mandatory** conformance groups must be selected to conform
  - **Optiona**l conformance groups may be selected by the project

- If the project user needs process does not map to these items (CGs and the mandatory objects they contain), it may suggest an incomplete process

OBJECT OR TABLE NAME	REFERENCE	CONFORMANCE REQUIREMENT WITHIN THE GROUP
rangeMaximumPreset	NTCIP 1205	mandatory
rangePanLeftLimit	NTCIP 1205	mandatory
rangePanRightLimit	NTCIP 1205	mandatory
rangePanHomePosition	NTCIP 1205	mandatory
trueNorthOffset	NTCIP 1205	mandatory
rangeTiltUpLimit	NTCIP 1205	mandatory
rangeTiltDownLimit	NTCIP 1205	mandatory
rangeZoomLimit	NTCIP 1205	mandatory
rangeFocusLimit	NTCIP 1205	mandatory
rangeIrisLimit	NTCIP 1205	mandatory
rangeMinimumPanStepAngle	NTCIP 1205	mandatory
rangeMinimumTiltStepAngle	NTCIP 1205	mandatory
timeoutPan	NTCIP 1205	mandatory
timeoutTilt	NTCIP 1205	mandatory
timeoutZoom	NTCIP 1205	mandatory
timeoutFocus	NTCIP 1205	mandatory
timeoutIris	NTCIP 1205	mandatory
labelMaximum	NTCIP 1205	mandatory
labelTable	NTCIP 1205	mandatory
labelEntry	NTCIP 1205	mandatory
labelIndex	NTCIP 1205	mandatory
labelText	NTCIP 1205	mandatory
labelFontType	NTCIP 1205	mandatory
labelHeight	NTCIP 1205	mandatory
labelColor	NTCIP 1205	mandatory
labelStartRow	NTCIP 1205	mandatory
labelStartColumn	NTCIP 1205	mandatory
labelStatus	NTCIP 1205	mandatory
labelLocationLabel	NTCIP 1205	mandatory
labelEnableTextDisplay	NTCIP 1205	mandatory

Example "CCTV Configuration" Conformance Group

NTCIP 1205, page 4-2

Each Mandatory object must map to a user need.

Example: "Motion Control" Configuration" Conformance Group-Optional

NTCIP 1205, page 4-4

OBJECT OR TABLE NAME	REFERENCE	CONFORMANCE REQUIREMENT WITHIN THE GROUP
presetGotoPosition	NTCIP 1205	mandatory
presetStorePosition	NTCIP 1205	mandatory
positionPan	NTCIP 1205	mandatory
positionTilt	NTCIP 1205	mandatory
positionZoomLens	NTCIP 1205	mandatory
positionFocusLens	NTCIP 1205	mandatory
positionIrisLens	NTCIP 1205	mandatory

If the project user needs, such as Pan-Tilt-Zoom functions are stated, each Mandatory object must be selected.

Traceability with Conformance Groups

- Traceability is ONLY through CGs in NTCIP 1205 standard

User Need	Conformance Group	Requirement	Object Support
UN 1 Configure CCTV Device	4.1.1 CCTV Configuration		
	4.1.3 Motion Control		
Other UNs			

- In the SEP based standard such as Dynamic Message Sign (DMS) a Protocol Requirement List (PRL) is made available for traceability

Confirming User Need Traceability

UN 1: Configure a CCTV Device

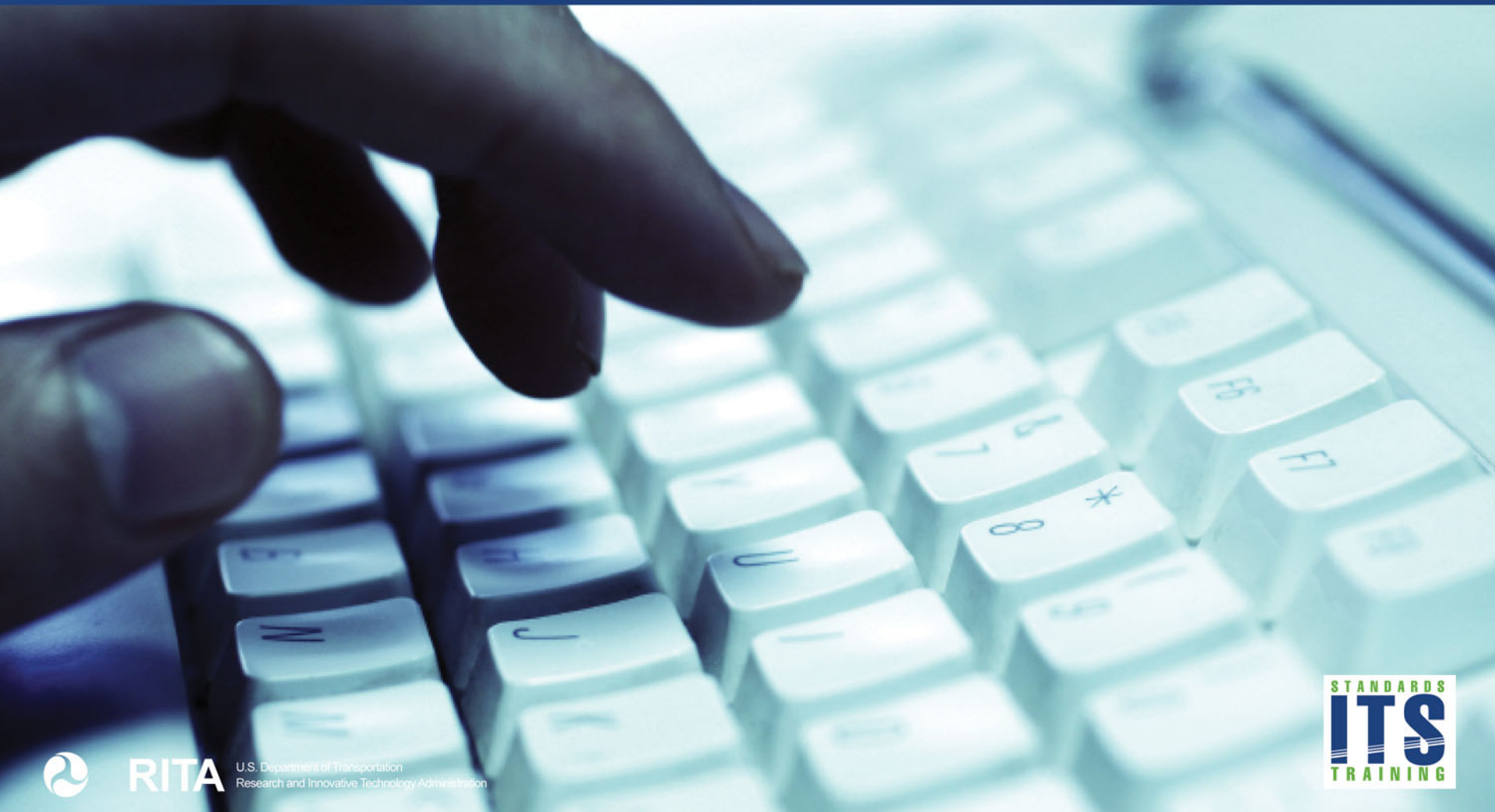
*A TMC operator with access to a management station has a **need to retrieve information** about the configuration of the CCTV device to properly communicate with the device. The controlling entity may also need to alter the configuration to produce expected operations.*

- "CCTV Configuration CG" objects will set the system parameters, so that user-specified Motion Control-PTZ will function properly.

Interoperability

- **Interoperability Issues**
  - CCTV systems are remotely accessed and controlled by a management station located at the TMC or other locations
  - To achieve interoperability, agencies must select same user needs and design solutions and use common protocols (compatibility)
  - Legacy platform-analog cameras and digital cameras network control may also present a challenge

ACTIVITY



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Which of the following is NOT a true statement related to the NTCIP 1205 CCTV standard?

Answer Choices

a) Supports video formats.
b) All mandatory CGs must be selected for conformance.
c) Extended Functions Conformance Group allows for On-Off of devices remotely.
d) Supports Pan-Tilt-Zoom (PTZ) capability for remote control operation.

Review of answers

a) Supports video formats.

Correct, because standard does <u>not</u> cover the video format standards-but rely on industry-standards.

b) All Mandatory CGs must be selected for conformance.

Incorrect, all mandatory CGs are required to be conformant.

c) Extended Functions Conformance Group allows for On-Off of devices remotely

Incorrect, because this CG does support On-Off control.

d) Supports Pan-Tilt-Zoom (PTZ) remote control operation.

Incorrect, standard does support PTZ capability.

Summary of Learning Objective #4

Evaluate Conformance to the CCTV standard

- NTCIP 1205 four conformance groups, one is made mandatory: CCTV Configuration
- Optional -“Motion Control” CG must be selected by users if they desire PTZ capability
- Features within NTCIP 1205 also depend on selection of some objects from the NTCIP 1201 v03 standard to be conformant

What We Have Learned

1. CCTV Standard does not provide ***user needs*** and user must ***identify*** and ***write*** them for project specification.
2. ***User need*** is the first step towards achieving ***interoperability*** and ***vendor-independence***.
3. User needs can be found in the traffic management ***Concept of Operations***.

What We Have Learned (cont.)

4. A user need must be ***uniquely identifiable***, defines a ***major desired capability***, captures a ***rationale*** and must be ***solution-free***.

5. NTCIP 1205 standard offers ***conformance groups*** which are defined as a grouping of the related objects.

6. NTCIP 1205 CCTV ***MIB*** provides ***Objects*** for CCTV system design.

Resources

- Participant Student Supplement
- NTCIP Standards available at www.ntcip.org:
  - NTCIP 1201 v03 Global Object Definitions
  - NTCIP 1205 v01.08 CCTV Camera Control
  - NTCIP 9001: Guide available at www.ntcip.org
- A202: Identifying and Writing User Needs When ITS Standards Do Not Have SEP Content
  www.pcb.its.dot.gov/stds_training.aspx

QUESTIONS?

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Next Course Module

A317b: Understanding Requirements for CCTV Systems Based on NTCIP 1205 Standard

- Explains how to write CCTV System requirements to **complete specification process**
- Explains how to show the relationship between requirements and the design from the standard
- Discusses communications interface details