Welcome

Ken Leonard, Director
ITS Joint Program Office
Ken.Leonard@dot.gov

www.pcb.its.dot.gov
ACTIVITY
A317a: Understanding User Needs for CCTV Systems Based on NTCIP 1205 Standard
Instructor

Raman K. Patel, Ph.D., P.E.
President
RK Patel Associates, Inc.
New York City, NY, USA
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)

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 Comm. Protocols and their Uses in ITS Applications

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

A317b Understanding Requirements for CCTV Systems Based on NTCIP 1205 Standard

T317 Applying Your Test Plan for NTCIP 1205 Standard
SEP Content in ITS Standards Helps Identify User Needs and Requirements

Specification Development

- Concept of Operations
- Requirements
- Design
- Annexes

Typically they provide:
- General
- Concept of Operations (User Needs)
- Requirements
- Design Details
- Annexes
Non-SEP Based ITS Standards More Difficult to Use

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

Field Location
- Cameras with Lens
- Pan/Tilt Assembly
- Receiver

Communications
- Leased circuits
- Shared network

Source: NYSDOT
Camera Control Architecture

Subject of NTCIP 1205

1. Traffic Management System (TMS)

Advanced Traffic Management Systems (ATMS) Architecture Service Packages (Market Packages)

2. Camera Control Receiver (Field Units)

3. Camera, Lens, and Pan/Tilt/Zoom Assembly

Proprietary Data

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

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

See Student Supplement for Definitions
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

Information Level
- C2C Data Dictionaries (TMDD, ATIS, TCIP, IM)
- NTCIP Data Dictionaries (1200 Series)
- C2C Messages
- Files
- Data Objects
- Dynamic Objects

Application Level
- C2C XML (2306)
- DATEX (2304)
- FTP (2303)
- TFTP (2302)
- SNMP (2301)
- STMP (2301)

Transport Level
- TCP/IP (2202)
- UDP/IP (2202)
- T2/NULL (2201)

Subnetwork Level
- PPP (2103)
- Ethernet (2104)
- PMPP (2101 & 2102)

Plant Level
- Dial-Up Telco
- Fiber
- Coax
- Wireless
- Twisted Pair
- Leased Line

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
What Should be in a CCTV Specification?

**Learning Objective #1**

**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

Easier System Expansion

Consistent control interface with the central systems, allowing more cameras

Remote Management Capability

Learning Objective #1

Source: FDOT-Katz
Benefits of NTCIP 1205 CCTV Standard (cont.)

Learning Objective #1

Benefit of Industry Standard (ITS)

Establishes a common understanding of ITS CCTV system features

Multiple Vendors Competitive Market

Agencies originate needs, developers build ITS systems, and vendors supply products, all are beneficiaries
The Outcomes: Compatibility, Interoperability, and Interchangeability

Learning Objective #1

Interoperability

NTCIP

Compatibility

Interchangeability

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)
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 other's 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
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
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.
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

- Multiple Stakeholders Needs Assessed
- Operational Problem Solving Needs & Agreement
- Reassessment Gaps-New Needs

Life Cycle Processes
- Regional Architecture(s)
- Feasibility Study / Concept Exploration
- Concept of Operations
- System Validation Plan
- System Validation
- System Verification (System Acceptance)
- System Verification Plan
- Subsystem Verification Plan (Subsystem Acceptance)
- Subsystem Verification
- Unit / Device Test Plan
- Unit / Device Testing
- Document / Approval
- Development Processes

Learning Objective #3

58
ACTIVITY
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

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

READ
Conformance Groups and CCTV MIB (70 objects)

RECOGNIZE
Categories of Functions they Represent

INFER
Major Desired Capability (MDC)

Write User Needs
Example: Extracting a Capability from the CCTV Configuration Conformance Group

Select, CCTV Configuration Group

Examine listed objects for *presets*, *position PTZ*, and *position Lens* parameters

Infer an Integer-number as MDC, say 32 presets Desired by a TMC
Example: Extracting a Capability from the Motion Control Conformance Group

**READ**

Select, Motion Control Configuration Group

**RECOGNIZE**

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

*presetGotoPosition*

**INFER**

TMC Operator has a capability to jump to a camera position at a pre-selected location
“The operator has a need to remotely adjust the **auto-focus of the camera lens**, status, and confirmation.”
Example of an MDC: “Auto-Focus”

**READ**

Select, CCTV Configuration and Extended Functions Group

**RECOGNIZE**

Examine Objects (5 required)
1. rangeFocusLimit
2. timeoutFocus
3. systemLensFeatureControl
4. systemLensStatus
5. systemLensEquiped

**INFER**

MDC: Operator has a need to adjust lens for near-far view for details
Learning Objective #3

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.

**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.
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-programmed 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
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

<table>
<thead>
<tr>
<th>Conformance Group</th>
<th>Conformance Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTCIP 1205 v01</td>
<td></td>
</tr>
<tr>
<td>CCTV Configuration</td>
<td>Mandatory</td>
</tr>
<tr>
<td>Extended Functions</td>
<td>Optional</td>
</tr>
<tr>
<td>Motion Control</td>
<td>Optional</td>
</tr>
<tr>
<td>On-screen Menu Control</td>
<td>Optional</td>
</tr>
<tr>
<td>NTCIP 1201 v03.15 has Global Objects Definitions</td>
<td>Some objects are made Mandatory</td>
</tr>
</tbody>
</table>
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
  - **Optional** 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
<table>
<thead>
<tr>
<th>OBJECT OR TABLE NAME</th>
<th>REFERENCE</th>
<th>CONFORMANCE REQUIREMENT WITHIN THE GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>rangeMaximumPreset</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>rangePanLeftLimit</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>rangePanRightLimit</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>rangePanHomePosition</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>trueNorthOffset</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>rangeTiltUpLimit</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>rangeTiltDownLimit</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>rangeZoomLimit</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>rangeFocusLimit</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>rangeIrisLimit</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>rangeMinimumPanStepAngle</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>rangeMinimumTiltStepAngle</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>timeoutPan</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>timeoutTilt</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>timeoutZoom</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>timeoutFocus</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>timeoutIris</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>labelMaximum</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>labelTable</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>labelEntry</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>labelIndex</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>labelText</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>labelFontType</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>labelHeight</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>labelColor</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>labelStartRow</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>labelStartColumn</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>labelStatus</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>labelLocationLabel</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>labelEnableTextDisplay</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>OBJECT OR TABLE NAME</th>
<th>REFERENCE</th>
<th>CONFORMANCE REQUIREMENT WITHIN THE GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>presetGotoPosition</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>presetStorePosition</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>positionPan</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>positionTilt</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>positionZoomLens</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>positionFocusLens</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
<tr>
<td>positionIrisLens</td>
<td>NTCIP 1205</td>
<td>mandatory</td>
</tr>
</tbody>
</table>
Traceability with Conformance Groups

- Traceability is ONLY through CGs in NTCIP 1205 standard

<table>
<thead>
<tr>
<th>User Need</th>
<th>Conformance Group</th>
<th>Requirement</th>
<th>Object Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN 1 Configure</td>
<td>4.1.1 CCTV Configuration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCTV Device</td>
<td>4.1.3 Motion Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other UNs</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- 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
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 not 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**.
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](http://www.ntcip.org):
  - NTCIP 1201 v03 Global Object Definitions
  - NTCIP 1205 v01.08 CCTV Camera Control
  - NTCIP 9001: Guide available at [www.ntcip.org](http://www.ntcip.org)
- A202: Identifying and Writing User Needs When ITS Standards Do Not Have SEP Content
  [www.pcb.its.dot.gov/standards_training.aspx](http://www.pcb.its.dot.gov/standards_training.aspx)
QUESTIONS?
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