

AGENDA

DRCOG REGIONAL TRANSPORTATION OPERATIONS WORKING GROUP

Wednesday, October 25, 2017
1:30 PM to 3:30 PM

**Trail Ridge Conference Room
CDOT CTMC
425 C Corporate Circle, Golden**

1. Welcome/Introductions

2. CDOT Ethernet Upgrade Update – Alvin Stamp

Last meeting's discussion on regional operations coordination highlighted that robust communications between jurisdictions is a critical requirement for many coordination functions. As such, CDOT will provide a status update on CDOT's Ethernet Upgrade projects – Phases 1 and 2.

3. CDOT Camera Sharing Discussion – John Williams, Matt Becker

Questions arose at last meeting's NICE Vision deployment summary. Additional clarification regional collaboration and cooperation will be provided.

4. Regional Operations Coordination – Automated Signal Performance Measurement

The upcoming ATSPM workshop will be more effective if we can guide FHWA on our regional needs. DRCOG will lead a discussion to further flesh out the operational concept introduced at the last meeting.

5. Regional ITS Architecture Annual Update

DRCOG will review the specific material distributed for review. DRCOG is requesting that the working group be prepared for the December working group meeting. The RTO working group will both provide input on configuration management and provide input to update near-term elements of the architecture.

6. Regional Project Coordination

- On-going CDOT projects
- On-going RTD projects
- On-going DRCOG projects
- TransSuite User Group Coordination
- Centrac's User Group Coordination

7. Other Items/Announcements

- Next scheduled RTO working group meeting date: **December 13th**

REGIONAL TRANSPORTATION OPERATIONS WORKING GROUP

2017 MEETING SCHEDULE

Meetings are normally held in the
Independence Pass conference room (1st Floor, west side)
at DRCOG (1290 Broadway, Denver, CO 80203)

1:30 – 3:30 PM

January 25
February 22
March 22
April 26
May 24
June 28*
July 26
August 23
September 27
October 25
December 13**

MEETING IS TYPICALLY HELD IN INDEPENDENCE PASS ON THE 4th WEDNESDAY OF EACH MONTH

*HELD IN MONARCH PASS

**HELD ON ALTERNATE DATE

REGIONAL TRANSPORTATION OPERATIONS WORKING GROUP

2018 MEETING SCHEDULE

Independence Pass conference room (1st Floor, west side)
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1:30 – 3:30 PM

January 24 ¹
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MEETING IS TYPICALLY HELD IN INDEPENDENCE PASS ON THE 4th WEDNESDAY OF EACH MONTH

1. ATSPM workshop scheduled for January 23rd
2. Bike-to-Work Day; ITE Western District Conference
3. Cancelled due to holiday.

**REGIONAL TRANSPORTATION OPERATIONS WORKING GROUP
MEETING SUMMARY**

September 27, 2017

Present at meeting:

Adams County (Mark Moskowitz, Brian Staley); Arapahoe County (Mike Comstock); Aurora (Tanya Bower); CDOT (Brian Tennent); Centennial (Bill Gilchrist, Stephanie Privette); Commerce City (Andrew Pihaly); Douglas County (Duane Cleere, Danny Montoya); Denver (Josh Jones, Rebecca LaFond); DRCOG (Steve Cook, Greg MacKinnon, Jerry Luor); E-470 (Jamal Yarber); Littleton (Aaron Heumann); RTD (Li-Wei Tung); Superior (Alex Ariniello); Thornton (Darrell Alston)

Regional Coordination Support

- In light of the Denver center-to-center coordination operations feasibility study and the needs expressed by this group regarding regional operations, Greg MacKinnon reviewed key areas of coordination.
- The center-to-center discussions have highlighted a desire for jurisdictions to be aware of transportation and system conditions beyond their boundaries to support their own operations.
- Mr. MacKinnon highlighted that many of coordination areas require robust communications between jurisdictions. This suggests a focus on infrastructure needed to support these functions.
- Alex Ariniello brought up an interest in the signal phase and timing (SPaT). He suggests that the working group should consider the sharing of this information with vendors, the implications to operations and the benefits provided to the jurisdictions. He suggested that perhaps regional guidelines and cooperation for application are necessary.

REGIONAL TRANSPORTATION OPERATIONS WORKING GROUP
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September 27, 2017

Coordination Area	General Functional Needs	General Operational Concept	General Requirements
Camera Monitoring	<ul style="list-style-type: none"> • Operator situational awareness • Traveler information tool 	<ul style="list-style-type: none"> • Share video, provide access to neighboring jurisdictions • Provide video (or snapshots) to CDOT 	<ul style="list-style-type: none"> • Robust communications • Compatible camera feeds • Compatible systems
Signal Performance Measurement	<ul style="list-style-type: none"> • Signal system performance <ul style="list-style-type: none"> • Is it working? • Is it providing adequate service? • Traveler information tool 	<ul style="list-style-type: none"> • Discussing regional application of ATSPM 	<ul style="list-style-type: none"> • Robust communications • Compatible data collection • Compatible performance measure application
Travel Time Monitoring	<ul style="list-style-type: none"> • Operator situational awareness • Traveler information tool 	<ul style="list-style-type: none"> • Collect data for local use • Share data with neighbors • Share data with CDOT <ul style="list-style-type: none"> • performance measurement • traveler information tool 	<ul style="list-style-type: none"> • Robust communications • Compatible data feeds • Performance measures system • Traveler information system
Coordinated Construction and Maintenance Traveler Information	<ul style="list-style-type: none"> • Operator situational awareness • Traveler information tool 	<ul style="list-style-type: none"> • Collect real-time construction and maintenance information • Share with CDOT • Share with other travel information services 	<ul style="list-style-type: none"> • New processes to monitor construction and maintenance • Compatible data feeds
Coordinated Incident Management	<ul style="list-style-type: none"> • Safe and quick incident identification and clearance • Operator situational awareness • Coordinated incident response • Traveler information tool 	<ul style="list-style-type: none"> • Public safety and traffic management share in detecting/confirming incidents • First responders and associated dispatch lead response • Follow incident management process (based on ICS) 	<ul style="list-style-type: none"> • Common training and application • Robust communications • Compatible data feeds • Performance measures system • Traveler information system

REGIONAL TRANSPORTATION OPERATIONS WORKING GROUP
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CDOT NICE Visions Implementation Update

- CDOT recently upgraded to Qognify NICE Vision 3.1, which includes improved database functionality on the CDOT business side and makes the software more stable.
- CDOT has converted all access to its traffic cameras from analog to digital (IP). Cameras that are on fiber are being streamed live and are available on NICE Vision. Cameras that are not on fiber are being provided as snapshots and are available on cotrip.org.
- CDOT's statewide license for Flir's Camera Chameleon expires December 31, 2017. **CDOT is not going to renew the license.**
- CDOT's open standard requirements for camera system compatibility:
 1. IP cameras should use H.264 video eyeing standard.
 2. ONVIF profile S standard for camera control and camera functionality.
- Local Agency access options for CDOT video:
 1. NICE Vision Web Application License
 - One-way sharing: CDOT to local agency
 - If local agency can demonstrate business to CDOT, CDOT will provide the agency with one license at no cost to the agency. The license can only be used by one user at a time. User logged into the system has priority.
 2. NICE Vision Client License
 - Two-way sharing if the local agency is connected via the CDOT fiber optic network. The agency will need to procure other equipment such as: server(s), recorder(s), switch, router, firewall. The agency can use CDOT's discounted pricing for equipment and licensing.
 - CDOT may provide the client license to the agency.
 - The agency will need to procure user license and camera license(s) (one-time fee plus annual maintenance)
 3. Camera Platform other than NICE Vision

- Two-way sharing if the local agency is connected via the CDOT fiber optic network.
 - Some local agencies may have other camera platforms, which may use RTSP (Real Time Streaming Protocol) to share feeds.
 - CDOT intends to deploy RTSP in return in spring 2018.
- CDOT's plan moving forward:
 1. CDOT testing to distribute cameras using multicast, which means that for each camera one camera stream is put on the network and the agency would request the stream. It also means that there is not opportunity for shared control of that camera.
 2. NICE Vision software is being upgraded to include additional functionality such as; seamless accessibility to multiple servers as CDOT plans to use a distributed video system, i.e., not having to log out of the user's system and into the CDOT system to access video and RTSP capability. Anticipated release spring 2018.
- For questions about CDOT's camera system and requests for NICE Vision Web application license, please contact both Matt Becker (matt.becker@state.co.us) and Bruce Coltharp (bcolpharp@navjoyinc.com).
 - Mr. MacKinnon asked on behalf of the local agencies about the Ethernet upgrade schedule and associated deployment of equipment presented by John Williams in August 2015. It was determined we need more information from other CDOT staff.
 - Mr. Ariniello asked about capabilities of the camera system to assist operator in catching issue on the video (i.e. video analytics, artificial intelligence). Stephanie Privette mentioned that Centennial received pricing for video analytics on NICE which is based on each feed desired – it can change from camera to cameras. Mr. MacKinnon highlighted also CDOT's use and expansion of TrafficVision – an incident detection software overlaid on existing video.
 - Duane Cleere asked about CDOT's policy on recording video since other jurisdictions would be sharing feeds with them. Further clarification from other staff is required.
 - Mr. Tennent said that CDOT will share a communications schematic with the working group for an understanding of the opportunities to connect to CDOT's fiber network.

Discussion of a Proposed Regional ATSPM Concept

- Summary of previous meeting's discussion:

1. There are two main functions to be provided by ATSMF:
 - Potential to assist signal system maintenance
 - Potential to assist with regional coordinated operations
 2. The UDOT visualization software can currently present existing ATC data to assist with signal system maintenance.
 3. The UDOT visualization software has critical gaps with respect to regional coordinated operations. It does not immediately support corridor evaluations or a trend analysis of performance metrics.
 4. The group also recognizes that utilizing existing operations UDOT optimization tools (individual intersection operations) could impact neighboring jurisdictions. For example, changes to optimize operations at one intersection can create issues at downstream signals.
 5. Views vary between jurisdictions, but it is recognized that ATSPM represents work for operators/engineers (the implication there are limited resources to conduct this additional work). The additional items include:
 - review of performance measures
 - determining action to be taken
 - coordinating action with neighbors
 - implementing action with neighbors
- Mr. MacKinnon proposed a regional ATSPM operational concept for further discussion:
 1. Roles
 - Local Jurisdictions/CDOT
 - implement compatible infrastructure
 - implement compatible visualization software
 - utilize software to improve system maintenance
 - utilize software to identify operational inefficiencies
 - implement coordinated operational tweaking
 - partner in corridors signal retiming efforts

- DRCOG
 - implement compatible visualization software
 - utilize software to identify operational inefficiencies
 - coordinate system tweaking with regional partners
 - determine when corridor signal retiming is required
 - coordinate partners in coordinated corridor signal retiming efforts

2. Immediate gaps in operational concept to address:

- No specific administrative processes have been determined (i.e. when and how will signal timing improvements be implemented or how will neighboring jurisdictions coordinate tweaking).
- Communications infrastructure between jurisdictions and DRCOG is lacking
- Detectorization – the focus for this operational concept is advance detectors as that will provide ‘arrival on green’ information critical for corridor coordination
- Controller hardware – do all jurisdictions have ATC and high-resolution data?
- Visualization software:
 - Some jurisdictions have implemented.
 - Current versions of visualization software do not meet the needs of the operational concept – customization is required
 - Open-source format may present a challenge especially when we consider customization to meet needs
- Duane Cleere noted the additional complication of the signal systems vendors already proceeding with the preparation of integrated ATSPM features that may or not be compatible with the operational concept.

Regional ITS Architecture Annual Update

- Mr. MacKinnon reminded the working group that we have committed to annual update to the Regional ITS Architecture.

- Mr. MacKinnon recommends reviewing the updated architecture with a focus on your jurisdictions' projects for the next five years, considering:
 1. Corrections/errors
 2. Changes in data flows
 3. Changes in elements (objects)
 4. Changes in projects (description, R&R, etc)
 5. Changes in standards and agreements
 6. Input on project sequencing
- Mr. MacKinnon reminded the working group that the national architecture was recently updated to ARC-IT 8.0. The DRCOG regional ITS architecture has also been upgraded to this newest version.
- Mr. MacKinnon highlighted the configuration management procedures DRCOG will be following that includes the working group as the configuration management team.
- The working group agreed to specific update goals and procedures for this year's update:
 1. Focus on implementations and system in the near term (five years)
 2. Consider items specifically listed in the Change Management Diary
 3. Consider items that need specific revision or correction
 4. Make deliberate and intentional addition of Connected Vehicles service packages
- Items currently contained in the Change Management Diary include:
 1. Database Maintenance
 - Run a spell check on all entries
 - Conduct check architecture-related features
 2. Iteris Recommendations
 - Remove Existing/Planned status definition
 - Separate Subsystems and Terminators where associated with a single element.

- Simplify Roles and Responsibilities entries
- Correct the TM02: Vehicle-Based Traffic Surveillance service packages

Regional Project Coordination

- **Denver Area Ethernet Upgrade** – The schedule can be found at: https://drcog-my.sharepoint.com/personal/gmackinnon_drcog_org/_layouts/15/guestaccess.aspx?folderid=1338459e5363d411fb37cfd4dfa830aeb&authkey=AeMLFLOPNhvOG-yLDZS9bRM
- **NICE Deployment** – On-going. Presentation today.
- **CDOT Data Warehouse** – CDOT plans to deploy a public facing website that will provide access to COGNOS reporting that no longer requires a VPN.
- **Denver CAD integration** – No progress. The project is stalled in the agreement process.
- **I-225 Restriping Project** – The I-25/I-225 interchange will be restriped and some barriers introduced to change weaving. Travel time monitoring on the surrounding roadways in place to determine the impacts.
- **Incident Management Plans:**
 1. **N I-25 Managed Lanes, US 36 Managed Lanes, I-76 Corridor Plan, I-70 High Plains Plan, C-470 Managed Lanes**
 2. **Regional Incident Management Processes** – On-going.
- **Ramp Metering System** – CDOT to issue an RFP by the end of this summer.
- **RoadX:**
 1. **Connected Vehicles Pilot** – Recent announcement from CDOT regarding involvement of Panasonic.
 2. **Smart 25 Pilot (aka Managed Motorways)** – Design complete: summer 2017; construction – fall 2017 – 2018; soft launch – summer 2018; full operation winter 2018.
- **CDOT Statewide ITS Architecture** – CDOT intends to issue an RFP for consultant support to update the previous architecture and define technology implementation plans.
- **CDOT Road Savvy Initiatives** – On-going.
- **RTD TSP Implementation and Coordination:**

1. **US 36** – Went into operational service and is being monitored.
 2. **Colfax** –TSP field testing set to be expanded.
 3. **I-225 Corridor** – No update
 4. **Regional** – TSP practice policy document development nearing completion
- **Denver Coordination:**
 1. **C2C Feasibility Study/ConOps** – Four key concepts shared with the working committee. Consultant preparing summary document based on that last meeting.
 2. **ATCMTD Grant** – Denver continues to coordinate with FHWA and RoadX. Enterprise Architecture is under development. Denver has deployed living lab to investigate the nature and flow of data on a limited scale.
 - **TransSuite User Group:**
 1. User group meeting coming in October.
 - **Centracs User Group:**
 1. Monitoring Denver’s center-to-center feasibility study.
 2. Englewood and Littleton anticipating Centracs upgrade
 - **FHWA**
 1. Tricia Sergeson can be contacted at patricia.sergeson@dot.gov.

Other Items/Announcements

- FHWA and DRCOG have initiated discussion to bring an FHWA ATSPM Workshop to Denver in December [UPDATE – the meeting has shifted to January].
- The next regularly-scheduled meeting is **October 25th**

NICE Vision Overview Summary

What is NICE Vision?

- NICE Vision is a video software platform that allows the user to manage, access and control video cameras.
- Recently, CDOT implemented an upgraded version of NICE Vision (3.1), which included improved database functionality on the CDOT business side and made the software more stable.

What is the status of Camera Chameleon?

- CDOT procured a statewide license for Flir's Camera Chameleon that made it available to any agency at no cost.
- The current license expires December 31, 2017. CDOT is not going to renew the license.

Why is CDOT using NICE Vision?

- To support situational awareness capabilities CDOT acquired Qognify Situator to integrate its devices and systems, and Qognify NICE Vision (NICE Vision) is the video software platform used by Qognify Situator.
- CDOT has converted all access to its traffic cameras from analog to digital (IP).
- Cameras that are on fiber are being streamed live and are available on NICE Vision.
- Cameras that are not on fiber are being provided as snapshots and are available on cotrip.org.

Qognify acquired NICE and changed the name of NICE Situator to Qognify Situator and NICE Vision to Qognify Nice Vision.

What options do Local Agencies have to get access to CDOT video?

NICE Vision Web Application License

- The agency must have a business need to access the CDOT traffic cameras, i.e., using the cameras to manage traffic, events, incidents, etc.
- This is for agencies that only want to access CDOT cameras and don't have cameras to share with CDOT.
- CDOT will provide the agency with one license at no cost to the agency.
- The license can only be used by one user at a time. User logged into the system has priority.
- There are 27 public agencies that have the NICE Vision Web application license.
- There are 14 news media that have the NICE Vision Web application license.

Agencies interested in obtaining the NICE Vision Web application license should email Matt Becker at: matt.becker@state.co.us and copy Bruce Coltharp at: bcoltharp@navjoyinc.com

NICE Vision Client License

- This is for agencies that have cameras (or are considering to install cameras) that they want to share with CDOT as well as get access to CDOT cameras. Most likely this would be applicable to agencies that don't have a video platform due to cost associated with obtaining it.
- The agency must be connected via the CDOT fiber optic network.
- CDOT may provide the client license to the agency.
- The agency will need to procure other equipment such as; server(s), recorder(s), switch, router, firewall.

- The agency will need to procure user license and camera license(s) (one-time fee plus annual maintenance)
- The agency can use CDOT's discounted pricing for equipment and licensing.
- CDOT is working with Denver and Thornton TV to set up the Nice Vision Client License to test camera sharing.

Agencies must determine which camera platform they choose to use based on functional and business requirements, cost and other factors pertinent to the agency. Therefore, CDOT is not requiring or recommending that agencies use NICE Vision.

Camera Platform other than NICE Vision

- This is for agencies that already have a camera platform, for example Milestone or other.
- The agency must be connected via the CDOT fiber optic network.
- Agency could use RTSP (Real Time Streaming Protocol) provided that their camera software provides that capability.

CDOT expects that RTSP will be available in the NICE Vision software upgrade, which is anticipated in spring 2018.

What is CDOT's plan going forward with Nice Vision?

- CDOT is testing to distribute cameras using multicast, which means that for each camera one camera stream is put on the network and the agency would request the stream.
- NICE Vision software is being upgraded to include additional functionality such as; seamless accessibility to multiple servers as CDOT plans to use a distributed video system, i.e., not having to log out of the user's system and into the CDOT system to access video and RTSP capability. Anticipated release spring 2018.

Open Standard System Compatibility for Cameras

- IP cameras should use H.264 video eyeing standard.
- ONVIF profile S standard for camera control and camera functionality.

Other Questions

If you have other questions or would like to discuss this information in more detail, please contact Matt Becker and/or Bruce Coltharp at the email addresses above to schedule a meeting.