



Colorado Western Regional Emergency Medical and Trauma Services (WRETAC)

Operational Rapid Assistance
Package (O-RAP)

Site Visit Summary Report

CISA/ICTAP-CO-SUMRPT-004-R0

July 2023 / W023-176

**ICTAP | Interoperable Communications
Technical Assistance Program**

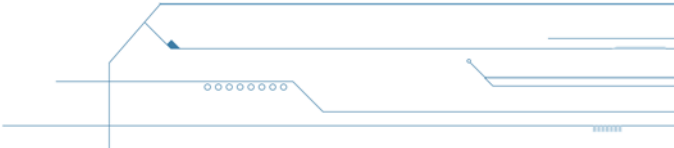


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O-RAP REMCDP PURPOSE

Between the 23rd and the 26th of April 2023, the Western Regional Emergency Medical and Trauma Services Advisory Council (WRETAC) in Colorado hosted a team of Subject Matter Experts (SMEs) from the Department of Homeland Security (DHS) Cybersecurity and Infrastructure Security Agency (CISA) supporting the Interoperable Communications Technical Assistance Program (ICTAP) Operational Rapid Assistance Package (O-RAP) for a site visit. O-RAP achieves the Rural Emergency Medical Communications Demonstration Project (REMCDP) mission to examine communications barriers and identify solutions that enhance existing emergency communications processes and infrastructure to improve the delivery of rural medical care and address National Emergency Communications Plan (NECP) implementation gaps.

O-RAP is a comprehensive assistance package from ICTAP. O-RAP begins with a rapid site survey where the host community meets with a team of SMEs to review existing communications challenges and solutions. The site visit serves as the forum for the examination and prioritization of emergency communications barriers.

WESTERN COLORADO COUNTIES MEETING OVERVIEW

This O-RAP Site Visit Summary Report (SVSR) project for the WRETAC was unique in that there were several counties surveyed rather than the usual one or two counties.

The areas surveyed for this technical assistance included Montrose, Gunnison, Hinsdale, Ouray, San Miguel, and Delta Counties in the State of Colorado's WRETAC. Several of the counties surveyed have a population center and central government in mountainous areas separated by several hours travel due to the orientation and terrain of the counties.

Participants in the survey and site visits included personnel with diverse backgrounds including the Colorado Statewide Interoperability Coordinator (SWIC), CISA Emergency Communications Coordinator (ECC) Region 8, and the following agencies:

- CareFlight of the Rockies
- Crested Butte Fire Protection District
- Delta County Ambulance District
- Delta County Dispatch
- Delta County Sheriff's Office
- Delta Health Emergency Department
- Delta Health Trauma Services
- Gunnison County Office of Emergency Management
- Gunnison Regional 911 Authority Communications Center/Gunnison/Hinsdale Emergency Telephone Service Authority
- Gunnison Valley Health
- Gunnison Valley Paramedics
- Hinsdale County EMS
- Hinsdale County Office of Emergency Management
- Montrose Fire Protection District
- Montrose County Public Health
- Montrose Regional Health Emergency Department
- Montrose Regional Health Education Department and Emergency Management
- Norwood Fire Protection District
- North Fork EMS

- Nucla Naturita Fire Protection District
- Ouray County EMS/Ouray County Mountain Rescue
- Ouray County Public Health
- San Miguel County Public Health
- San Miguel County Sheriff
- State of Colorado Department of Public Health and Environment's Office of Emergency Preparedness and Response
- State of Colorado DHS Emergency Management
- State of Colorado Governor's Office of Information Technology
- Telluride Fire Protection District
- West All-Hazards Region
- West Region Health Care Coalition
- Western Colorado Regional Dispatch Center (WESTCO)
- Western Regional Emergency Medical and Trauma Services Advisory Council (WRETAC)

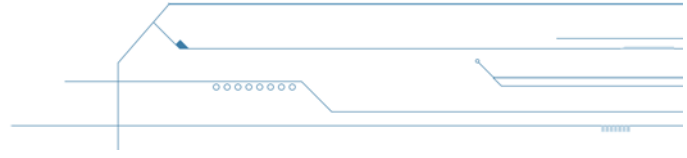
An in-person meeting was held on April 24th at Montrose Regional Health, 800 S. 3rd St., Montrose, Colorado. An online meeting portal was made available for participants who could not attend in person. The CISA/ICTAP team attended the meetings and conducted site visits at the following sites:

- Black Canyon of the Gunnison National Park
- Delta County Sheriff Dispatch
- Delta Health
- Hotchkiss Ambulance/Delta County North Fork Ambulance District – Hotchkiss
- Gunnison County EMS Gunnison (Dispatch)/Hinsdale Combined Emergency
- Gunnison Regional Communications Center
- Gunnison Valley Health Hospital,
- Hinsdale County Sheriff
- Inter-Agency BLM/USFS Montrose
- Lake City (Hinsdale County) EMS
- Montrose Regional Health Emergency Department
- Montrose Regional Health Emergency Physicians
- Norwood Fire Protection District
- Nucla-Naturita Fire Protection District
- Ouray County Emergency Medical
- Telluride Fire Protection District
- Telluride Regional Medical Center
- West All-Hazards Region
- West Region Healthcare Coalition
- Western Colorado EMS Leadership Council
- Western Colorado Regional Dispatch Center (WESTCO)
- WRETAC

During the site visits and the combined meeting, the team facilitated discussions, assessed input from participants, and identified strengths and weaknesses in communications capabilities.

WESTERN COLORADO COUNTIES SURVEY INFORMATION

The survey was focused primarily on the provision of emergency medical care but also included discussions regarding challenges encountered by other entities that supported or were associated with the delivery of emergency medical care in the WRETAC. In addition to the initial visit, the team affirmed their commitment to assisting the WRETAC with the completion of those identified issues that are within



the scope of, and which can be completed within, the timeline for this project. All assistance provided to the county will be coordinated through and with the SWIC and the CISA ECC to ensure that actions taken by the survey team do not conflict with ongoing processes presently underway. This assessment included but was not limited to, a review of communications systems/infrastructure, processes, and other areas addressed in the Interoperability Continuum.

As part of this report, gaps were aligned to the Interoperability Continuum. The Interoperability Continuum, developed by the DHS SAFECOM program and shown in Figure 1 on page 6, serves as a framework to address challenges and continue improving operable/interoperable and public safety communications. It is designed to assist public safety agencies and policy makers with planning and implementing interoperability solutions for communications across technologies and across the Emergency Communications Ecosystem. The complete list of gaps begins on page 15.

During the site surveys, the team identified and prioritized needs with the host community, leading to the selection of gaps that can be addressed through the O-RAP process. In the WRETAC area, gaps were identified through informal, open discussions with emergency communications personnel, responders, dispatchers, and technical experts at eight different locations of different makeup and scope. Discussions covered a wide range of topics including communications infrastructure and security, coverage gaps and outages, system usage, training, policies, coordination with mutual aid partners, and plans for special events and major incidents.

Collectively, participants and the SMEs developed a list of gaps and challenges. Different counties in the WRETAC experienced different challenges, and each addressed gap only applies to some counties. Challenges include the lack of a Continuity of Operations (COOP) plans for the Public Safety Answer Points (PSAPs) and other public safety agencies, lack of formalized Standard Operating Procedures (SOPs)/Standard Operating Guidelines (SOG) for daily and major incident radio usage, and the lack of cybersecurity awareness in the emergency communications ecosystem and general radio usage.

Interoperability has been a struggle both inside the WRETAC and with neighboring counties. In some areas, interoperability may be improved at the Dispatch Center level by installing consoles that are integrated into the Colorado State Digital Trunked Radio System (DTRS). There is heavy reliance on cellphone usage as a result of the nature of voice and data communications between EMS and Hospitals, Medical Control, and Telehealth providers. Unfortunately, cellular coverage in the region is sometimes unavailable making cellular communication difficult if not impossible. Land Mobile Radio (LMR) resources may be used as alternate options in many instances; however, different radio systems are available with coverage in different areas of the region. Personnel may not be familiar with the different channel options that are available to them because of lack of training on their radios as well as the complexities of the radio frequency landscape in the area. Western Colorado has many communications challenges due to mountainous terrain, canyons, gorges, and mesas. However, responders in the area have learned how to deal with these obstacles and “make it work” as is a common finding across the country.

NEXT STEPS

At the conclusion of the site visit, the team discussed the next steps for this project. O-RAP is a comprehensive technical assistance (TA) package, and the WRETAC area will be offered assistance to complete gap-aligned technical assistance offerings, possibly including assistance with SOP or Governance documents, training opportunities, engineering surveys, or assistance with exercise and



usage planning and delivery. In the Prioritized Gaps section of this report, the project work associated with O-RAP is described and timelines are provided for completion. There may be additional needs that the area can work with the SWIC and the CISA ECC to address through future technical assistance outside of the O-RAP process.

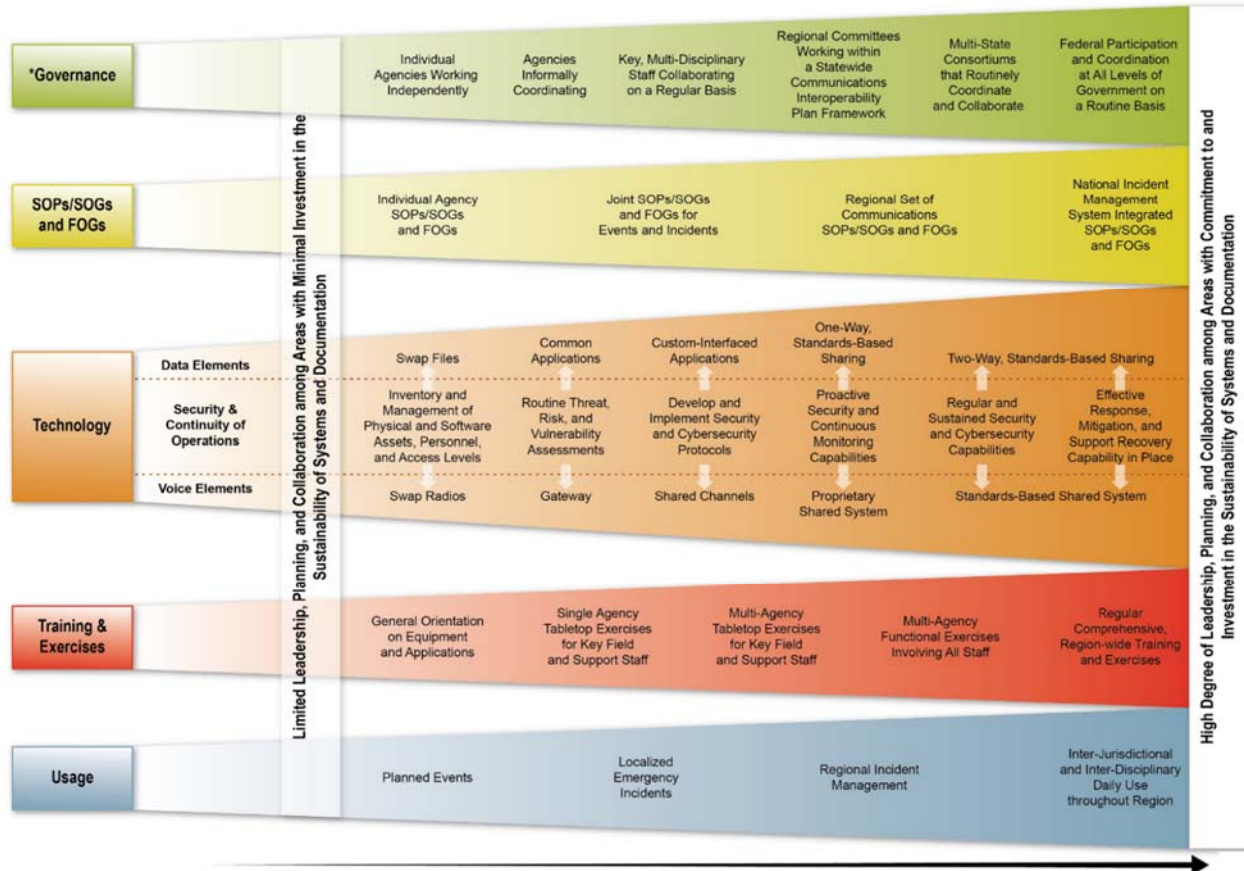


Figure 1. The Interoperability Continuum

GENERAL FINDINGS

This SVSR provides a baseline assessment on communications operability and interoperability challenges faced by emergency medical personnel, a prioritized listing of recommendations for identified issues, and a tool that can be used to help the area improve communications. With this knowledge, local, state, and regional emergency medical agencies can develop, prioritize, and focus their efforts on achieving and improving jurisdiction-to-jurisdiction communications.

This section presents an overview of the discussions during the site visit including gaps and challenges that are further detailed in a table in the following section. The WRETAC O-RAP was the first in the program to focus on a region rather than a single county, thus the findings discussed are either common across most or all of the counties in the WRETAC or are extreme in at least one county.



Governance

Governance Structure

There was no evidence of formal, local governance in terms of policy/procedure. Agreements do exist as far as sharing frequencies; however, those agreements should be formally documented and expanded to cover the entire region.

Governance in the region falls to three regional entities: the WRETAC, the Western Region Healthcare Coalition (WRHC), and the West All-Hazards Region (WAHR). Fortunately, these three groups are aligned in terms of relationships as well as in terms of sharing borders, which positions the region well to have a strong and beneficial governance structure in place for Emergency Medical communications. A regionwide communications focused working group and communications plan would allow emergency medical responders to communicate with one another easily given shared talkgroups/channels because their radios would be programmed the same way. Consistent programming of radios across jurisdictions means that talkgroups/channels would be labeled the same and located in the same place from one radio to another. In a multi-jurisdictional incident, this allows emergency medical responders to easily find the channels that they need to interoperate.


SOPs/SOGs, and FOGs

There is limited formal written guidance related to interoperable emergency communications (i.e., SOPs, SOGs, Field Operations Guides (FOGs)) for emergency medical personnel. While emergency medical responders are familiar with, and are successful at, communicating during day-to-day operations, a larger incident or special event may require operations outside the daily norm and there may not be documented procedures for these situations. Specific examples of plans that may benefit the emergency medical responders in the region include up to date PSAP COOP plans, Cyber Incident Response Plans (CIRP), special event interagency communications plans (ICS 217A/205), and Primary, Alternate, Contingency, and Emergency (PACE) communications plans. These plans should integrate into a larger regional interoperable communications strategy and be aligned with other individual County plans including Emergency Operations Plans (EOPs), Incident Action Plans (IAPs), and Continuity of Government (COG) and COOP plans.

COOP, PACE and COG Plans

Develop a COOP plan; PACE plan; and COG plan. All public safety entities and units of government should consider creating or updating (if any of the preceding already exist) those elements that are relevant to their entity or unit of government. A COOP plan is critical for PSAPs and would allow emergency medical personnel to continue receiving dispatches even in a situation where the PSAP must be evacuated or is inoperable for some other reason. Emergency medical personnel would also greatly benefit from a communications focused PACE plan to allow them to communicate with one other, with hospitals, and with their dispatch centers. Having COOP and COG plans in place will help assure that all business practices for agencies and county government continue despite loss of personnel and/or infrastructure.

Start by updating the COOP plan for the communication centers. Typically, the COOP plan for the communication center is relatively static once systems are in place. The template used for updating the COOP plan for any of the dispatch centers can then be used for the other agencies within each county. By using a common template, you will also create a consistent, easy to follow document across



disciplines. Once the COOP plans have been updated, they can be referenced when building a COG plan. (Emergency Managers are usually vital in producing the COG document.)

Tactical Interoperable Communications Plan

The region has a Tactical Interoperable Communications Plan (TICP) for the WRETAC which includes emergency medical resources along with resources from other disciplines (e.g., Law Enforcement, Fire, Emergency Management). The TICP is currently being updated. Having a regional TICP bolsters interoperability between the counties in the WRETAC and this is a major success for the region.

Standard Operating Procedures

Create a list of SOPs that need to be developed for basic emergency medical communications as well as specialty areas such as interoperability, console patching, responder down, etc. Encourage coordination between the emergency medical and other public safety agency leadership in each county to create county specific lists of needed SOPs. Create a format that will be used for SOPs within the region if a standard format does not already exist and create deadlines for completion and assign drafting responsibilities to county team members. Consider finding a single source to review the drafts for formatting, sentence structure and spelling. Once the final drafts are ready, the next step will be to train all personnel on the SOP to make certain all personnel impacted by the SOP understand it ahead of it being deployed and put into service. Finally, pull the group back together and conduct a Tabletop Exercise (TTX) to test the validity of the SOPs that were drafted.

Air-to-Ground Communications Policies

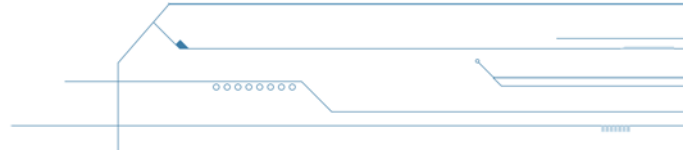
The region does not have a consistent air-to-ground communication policy. In absence of such, how ground emergency response personnel communicate with incoming air medical services depends on which service is responding to the request for air medical support.

Sometimes dispatch and ground units cannot hear inbound aircraft and sometimes it is vice-versa. There are times dispatch must relay to the aircraft from the ground units, then the aircraft transmits back to their dispatch. There are also occasional issues with the aircraft being able to communicate with the hospitals and vice versa. This is potentially a catastrophically unsafe situation.

The team recommends that each county consider creating a written policy for use by all emergency response agencies within the respective counties and by air medical services that may support each county. The policy should, at a minimum, stipulate a single air-to-ground frequency that would be used by all agencies when air medical resources were being utilized in each county. A simplex frequency with no Continuous Tone-Coded Squelch System (CTCSS) or Digital Private Line (DPL) is recommended. This reduces the chances of a programming error in the aircraft radios.

Standardized Radio Programming Format

Develop standardized radio programming and encourage all radios used on county frequencies to be programmed with those resources. Include all non-federal interoperability channels for each band on which the radio is capable of operating. Utilizing pre-identified channel naming structures (e.g., NIFOG, State, or local), create a zone and channel structure that will be consistent among all radios. Doing so will make the process of moving personnel to a designated resource easier and faster.



Technology

WRETAC counties face many challenges which include varying mountainous topography in and around the region. There are large areas in several counties where no radio coverage exists; radio and cell phone coverage is sketchy in many other areas. There are Radio Frequency (RF) extenders located in various locations around the region; however, an engineering study to determine the best location for the extenders may be a good option to address the lack of coverage.

Some local dispatch centers are operating their consoles with control stations and consolettes. Interoperability would be enhanced with consoles integrated into the State DTRS and repurposing some of the current consolettes/control stations to be used with conventional frequencies. This form of deployment coupled with local conventional radio gateways and control stations would allow dispatch centers to create patches between disparate responder resources that are available on the radio network. This also allows for resources to be shared between dispatch centers, expanding the availability of resources.

Major Dead Zones/Lack of RF Coverage

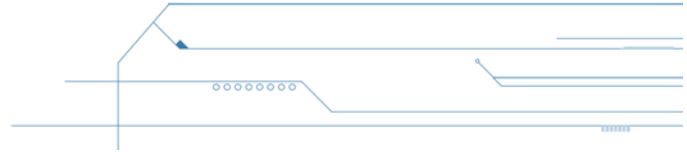
There are major dead spots with no coverage in several, if not all, of the counties in Western Colorado because of the topography. The team identified topography as a major challenge to all communications in the counties well before they arrived on site. The topography is mountainous with some elevations exceeding 11,000 feet. Communications towers are usually placed on mountains where transportation and utility infrastructures are available. There is an assumption that high antennas equal excellent coverage, but this is not necessarily the case. Sometimes the signal can't make it vertically downward into the valleys and sometimes the signal is blocked horizontally by other mountains. Every radio/communications system, including cellular, broadband, and LMR, is challenged by topography.

All of the communications systems in the region have dead zones. It was pointed out that every public radio system in the region has coverage issues. Different systems have issues in different geographic areas, but, according to responders in the area, if you combined the coverage provided for every public safety radio system in the region, coverage saturation would still not be achieved. Emergency medical agencies routinely depend on multiple systems (e.g., VHF, UHF, DTRS, cellular voice, and text messaging) to maintain even a minimum standard of communications access.

Unfortunately, there may not be a single solution for the coverage issues in the region because of the terrain. In some areas where there are insufficient towers, satellite two-way radio might normally be considered an option, but even with geosynchronous satellites there will be places where the dome antenna will be unable to maintain line of sight with the satellite. Additional tower sites will help but will still leave gaps in coverage and there are financial limitations on how many tower sites can be acquired. Additionally, there are limits to the mountains that have utilities or at least roads to support access to the mountaintops where the towers would need to be located. Encourage emergency medical agencies to start mapping areas where they consistently encounter difficulties with each of the public safety LMR systems as well as public safety dedicated or private vendor cellular and broadband systems. Maintain a separate map for each radio system and cellular carrier. Periodically overlay the maps to identify:

- Areas where communications loss are encountered by all the public safety radio and cellular systems (nothing works in these areas)
- Areas where communications partial loss or disruptions are encountered by some of the public safety radio and cellular systems (some communications work in these areas)





In areas where some system(s) work, train staff on what system(s) do work so they know what viable alternatives exist in areas where communication difficulty is routinely encountered.

An engineering study that includes a drive test to identify actual on the ground cellular coverage would be beneficial for the region in identifying a formalized set of coverage data that is gathered independently from any of the cellular carriers or vendors. SMEs can be made available through a TA request to assist with a drive test process as part of an engineering study. Additionally, there are various technologies available that can help mitigate the issue of cellular coverage by providing greater opportunities to access the limited coverage that is available (e.g., vehicle mounted cellular amplifiers) or by providing access to multiple carriers (dual-sim devices) so that as coverage for one provider drops off, connection can be maintained through another carrier. The region should research the feasibility and desirability of the various options available and secure funding to implement solutions that are found to be beneficial.

It is also worth mentioning that the same cellular coverage gaps that EMS personnel experience represent a risk to the public as well. The public may have even less access to a system that would allow them to call for help in an emergency. If the public cannot access communications pathways, then responders may be able to communicate with one another, but they are still not going to be able to provide assistance where needed.

Connecting the EMS Radio Systems to Dispatch Consoles

Connecting the EMS radio system to the dispatch's fully integrated console would enable EMS to use a variety of features and abilities that are not available on the stand-alone control/base station consoles. An example of such a capability is console patching (gateway) between radio systems.


Internet Coverage Gaps by All Carriers

There are internet coverage gaps by all carriers in the WRETAC. As discussed above, each of the major cellular carriers has coverage gaps within the region. In addition, cable/fiber service for fixed locations provide varying degrees of internet reliability and speed. In areas where cable, fiber or cellular services are unavailable or provide less than acceptable levels of service, satellite service may be a viable option; however, satellite service is very expensive and is likely to suffer from some of the same issues as cellular and LMR coverage resulting from the terrain in the region. Carefully research any possible solutions to coverage issues, including the limitations of those solutions, before making any decisions to implement them. Some of these counties should also engage cellular carriers that serve the area to voice their concerns regarding coverage gaps. Request carriers provide the counties with an update to their build out plans. If the county or a public safety entity owns sites that might be beneficial to cellular carriers, consider co-location agreements provided the sites are engineered in a manner that will allow them to support additional weight/structures. These agreements could potentially be beneficial to all parties. Co-location agreements are often a great solution to coverage issues and monetary shortcomings.

Radio Programming Technician

During discussion regarding the inconsistency in radio programming across the region, a common problem for regional EMS agencies is the lack of a radio programmer who can program different makes and models of radios on disparate radio systems. Additionally, the rural nature of some of the municipalities means that a radio technician must travel long distances in order to program radios and charges the agencies for that travel time. This makes a programming solution cost prohibitive while also creating logistical difficulties because EMS responders would have to gather all of their radio equipment in one place at one time to be programmed. Attempt to identify a local vendor, a current employee, or





possibly hire a programmer who would be able to work with all agencies within each county. It is also strongly recommended that the radios be tuned at the time they are reprogrammed, and at regular intervals after that initial programming.

Training and Exercises

Basic Radio Operations Training Program

Develop/deliver a basic radio operations training program that can be used to provide initial and refresher training for emergency medical personnel. Any time radio usage or technology changes, update the training to reflect those changes. Leverage already existing training (e.g., counties within the WRETAC, State of Colorado) that can be delivered as is or modified to meet the needs of each county. SMEs may be made available to assist with developing a training program, if necessary. That program would coordinate with any previously existing training programs to maintain consistency and would become the property of the WRETAC or the county for which it was developed after an initial roll out. With a workforce that is largely comprised of volunteers, and with the percentage of turnover evident in the region, having an in-house program that can be delivered as needed will help assure personnel understand how to operate their radios and what channels are contained therein.

Conduct a Communications Focused Exercise

After appropriate governance and SOPs/SOGs are implemented, conduct a region wide communications focused Exercise to test and validate the 911/Emergency Communications Center COOP plan, channel naming and code plug¹ design, the communications training program, and the personnel training process developed as a part of these recommendations. Ideally, the first exercise would be a Tabletop Exercise (TTX); a discussion-based exercise that allows participants to take time to think about their reactions and response and fully discuss the implications of the procedures and plans. Following a TTX, then a Functional Exercise (FE) could be considered.

Cybersecurity Awareness Training

There was some lack of knowledge about the cybersecurity concerns and issues that could affect and impact a dispatch center, radio network, and IT infrastructure. The Colorado SWIC is working on implementing awareness training statewide, and there are some opportunities for this training from ICTAP as well.

COMU Training

The State of Colorado SCIP has identified Communications Unit (COMU) Training as a priority. EMS responders in the WRETAC have generally not received this training. COMU awareness training is available from ICTAP, in addition to Incident Communications Manager (INCM)/Incident Tactical Dispatcher (INTD) awareness and the full training courses for all of the COMU positions (e.g., Communications Unit Leader (COML) and Communications Technician (COMT)). Awareness webinars would be a substantial step in the right direction for EMS responders to become credentialed in COMU positions.

¹ A code plug is a file that contains all of the programming information for a radio. It defines not only the frequencies on which a radio can transmit and receive, but also which talk groups that the radio can communicate over, as well as other operating parameters.



Usage

Local fire departments are often using their own licensed conventional frequencies and there may be issues regarding sharing access to those frequencies amongst allied agencies. A comprehensive communications plan which includes each fire department, EMS, hospital, and law enforcement agency would benefit interoperability.

Local Communications SOPs and Plans for Planned Events

Several local planned events were identified during the visits that could benefit from a more robust communications plan and process. Although beyond the scope of this O-RAP, the team recommends that EMS agencies incorporate more of the local processes and procedures into their local events.


Referencing the State Standards for Interoperable Talkgroups on the State System

Talkgroup and radio aliases are built into the system through a maintenance terminal. The naming convention used when building these resources refers to the actual names or labels that the dispatchers see on the console. Ensure that the leadership group putting together the fleet maps have access to the state naming conventions of talkgroups so that the dispatchers and field users see the same label, thus enabling a common language between all parties.

Best Practices Guidelines

As requested by the site Point of Contact (POC), below is a list of general guidelines for communications best practices that should be considered in the WRETAC. These guidelines are designed to be relatively general in nature so that they apply across the WRETAC.

- Redundant communications pathways with formalized written plans in place (i.e., PACE planning with trigger points clearly identified).
 - Separate PACE plans for different types of communication (e.g., responder-to-responder, responder-to-agency, agency-to-agency, local-to-state)
- Radio and communications training for all responders who will be using communications devices.
 - Standardized training throughout the WRETAC.
 - When, where, how to use each device, including information security and radio etiquette.
 - At least one county already has radio awareness training developed and regularly delivered; leverage that training for other counties.
- Regular training and exercises for communications policies and procedures.
 - Exercises don't have to be large-scale; monthly small-scale drills (i.e., "can you hear me now" exercises) are very beneficial.
- Consistent radio programming across the WRETAC, ideally consistent across the state.
 - Local mapping for day-to-day use zones, but some zones reserved for mutual aid talkgroups/channels that are the same no matter the radio/system (dependent upon frequency band).
- Formalized Mutual Aid Agreements (MAAs) or Memoranda of Understanding (MOUs) to facilitate mutual aid when necessary.
 - Include communications expectations and procedures.

- 
- Creative solutions for overcoming coverage gaps in the WRETAC.
 - At least one agency has a device that allows cellular communications using any of three different carriers, depending on which has the strongest signal. Given the relatively low cost of the devices in use in the region, they may be an excellent way to resolve some of the coverage gaps that are shared by every community in the region.

Conclusion

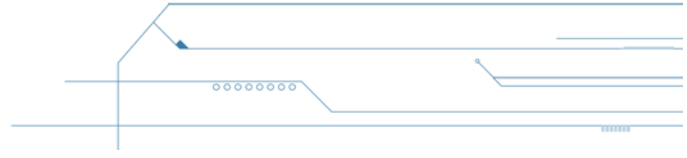
This Site Visit Summary Report (SVSR) provides a baseline assessment on communications operability and interoperability challenges, a prioritized listing of recommendations for identified issues, and a tool that can be used to help the County improve communications. With this knowledge, local, state, and regional agencies can develop priorities and focus their efforts on achieving and improving jurisdiction-to-jurisdiction and state communications.

Recommended Prioritized Gaps

During the site visits, the following gaps were identified as the highest priority to address through this Operational Rapid Assistance Package (O-RAP) project. The intention is for Technical Assistance (TA) to address these gaps to be coordinated by the O-RAP team in coordination with the SWIC and CISA ECC.

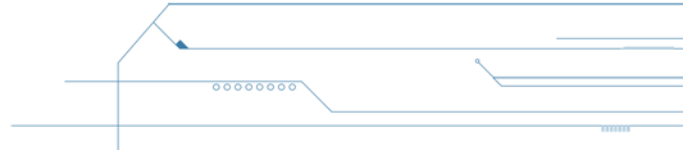
There is a table on the following page that lists all gaps discussed during the site visit. Additional TAs may be requested outside of this O-RAP project through the region's SWIC for the opportunities and gaps that are outside the scope and timeframe or aren't feasible within the O-RAP process.

Gap Description	Proposed Solution	Expected Outcome	Target Date
No Continuity of Operations (COOP); Primary, Alternate, Contingent, Emergency (PACE); and Continuity of Government (COG) plans. A COOP plan needs to be developed for county agencies that will address how a catastrophic loss of communications infrastructure would be addressed.	Develop/update PSAP COOP plan	<ul style="list-style-type: none"> Public Safety Answering Point (PSAP) COOP plan COOP plan template 	TBD
There is limited written guidance related to emergency medical response communications. A planning session should be held to identify and prioritize plans, policies, and procedures that need to be developed.	Hold a planning workshop to define and prioritize plan needs; create a format for policies and procedures; develop a roadmap and deliver plans.	<ul style="list-style-type: none"> Planning workshop Planning roadmap Completed plans, policies, procedures, and a template 	TBD
There is a need to exercise the COOP plan once developed.	Deliver COOP tabletop exercise (TTX)	<ul style="list-style-type: none"> COOP TTX AAR (Homeland Security Exercise and Evaluation Program (HSEEP) consistent) 	TBD



Gap Description	Proposed Solution	Expected Outcome	Target Date
Lack of cellular coverage in the region is problematic for EMS personnel in their day-to-day work. Cellular is the primary form of communication for EMS personnel, and they are often required to send data rather than just voice, which requires cellular/broadband access.	Request LTE survey, including a drive test, for all three carriers to identify true coverage maps versus those theorized by the carriers.	<ul style="list-style-type: none">• Unvarnished cellular coverage data in a formalized report.	TBD
There are training courses identified by the O-RAP team to support regional needs.	Develop and implement a training plan. Provide training to users, as appropriate.	<ul style="list-style-type: none">• Custom WRETAC training• PSAP Cyber-awareness webinar• Incident Tactical Dispatcher (INTD)/Incident Communications Manager (INCM) Awareness	TBD



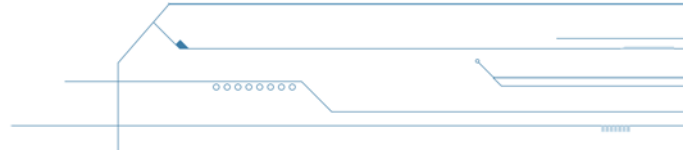


Gaps Table

This table presents all emergency communications gaps discussed during the site visit, including gaps outside the scope of O-RAP. These gaps are aligned to the Interoperability Continuum.

Gap	Interoperability Continuum Lane
There is limited written guidance related to emergency medical response communications. A planning session should be held to identify and prioritize plans, policies, and procedures that need to be developed.	Governance
Develop a Continuity of Operations Plan (COOP); Primary, Alternate, Contingent, Emergency (PACE) plan; and Continuity of Government (COG) plan. A COOP Plan needs to be developed for county agencies that will address how a catastrophic loss of communications infrastructure would be addressed.	SOPs, SOGs, and FOGs
Complete updating the TICP for the Western Colorado Counties.	SOPs, SOGs, and FOGs
Communications Systems Infrastructure Coverage Gaps. The current communications system infrastructure has clearly identified gaps in coverage that present a real danger to responders and patients when operating in certain geographic areas of the county.	Technology
Request LTE survey for all three carriers to identify true coverage maps versus those theorized by the carriers. This will help in identifying areas in which Electronic Patient Care Reporting (ePCR) can be transmitted.	Technology
There are multiple dead spots due to topography in each county in Western Colorado because of mountainous areas with low-lying river bottoms and valleys. As a result, there are significant challenges in acquiring consistent, uniform radio and cellular access in the region. EMS heavily relies on cell phone usage instead of radios as a result of the nature of voice and data communications required in their day-to-day work. While LMR solutions should remain available to EMS personnel, cellular coverage is a greater priority.	Technology
Poor Cell Coverage and/or coverage does not match that as provided or projected by the service providers	Technology
The area lacks the required personnel to adequately and efficiently keep radios programmed and tuned as required for functionality on the various radio systems. Because many of the agencies represented in this region are at great distances from population centers, it is difficult to find anyone who can program the radios, and when someone is identified, that person's costs are often prohibitive. It is important that these rural agencies have access to programming, and thus steps should be taken to ensure that local personnel are able to gain the rights to conduct these activities.	Technology
There are limited communication exercises for field units, particularly between fire departments and EMS.	Training and Exercises
Need COMU training in the local area, allowing local EMS responders to attend without incurring excessive cost (e.g., RADO, INTD, COMT, ITSL and COML).	Training and Exercises
Request technical assistance and conduct awareness training on cybersecurity concerns and issues that could affect and impact a dispatch center, radio network and IT infrastructure. Suggest statewide cybersecurity training. Consider the need for a comprehensive cybersecurity assessment.	Training and Exercises



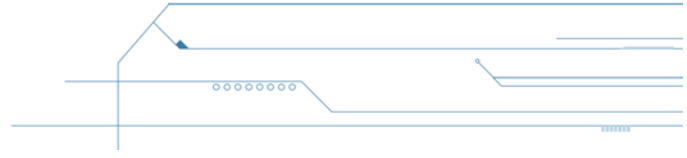


Conduct a Tabletop Exercise (TTX) to validate the PSAP COOP plan once it is developed/updated.	Training and Exercises
Conduct a Communications Focused Exercise. After appropriate governance and SOP/SOGs are implemented and validated through a TTX, conduct a countywide Functional or Full-Scale Communications Focused Exercise	Training and Exercises
Develop a basic radio operations training program that can be used to provide initial and refresher training for personnel.	Training and Exercises
Develop a standardized radio programming format and naming conventions. Leverage the standard already in place within the State of Colorado for this purpose. Ensure that any programming format that is used in the region is consistent with the programming requirements of the radio system in question. As an example, the Consolidated Communications Network of Colorado (CCNC) is a useful resource for programming templates for the state's Digital Trunked Radio System (DTRS).	Usage
Engage the major carriers and request an update to build out plans. If a county owns sites, make sure the carriers are aware of their parameters. If the sites are engineered so that they will support additional structures, co-location agreements may be something of interest to all parties.	Usage
Ensure agencies and areas incorporate more of the local processes and procedures into their local events.	Usage



ACRONYMS LIST

Item/Acronym	Definition
BLM	Bureau of Land Management
CIRP	Cyber Incident Response Plan
CISA	Cybersecurity and Infrastructure Security Agency
COG	Continuity of Government
COML	Communications Unit Leader
COMT	Communications Technician
COMU	Communications Unit
COOP	Continuity of Operations
CTCSS	Continuous Tone-Coded Squelch System
DHS	Department of Homeland Security
DPL	Digital Private Line
DTRS	Digital Trunked Radio System
ECC	Emergency Communications Coordinator
EMS	Emergency Medical Services
EOP	Emergency Operations Plan
FOG	Field Operations Guide
HSEEP	Homeland Security Exercise and Evaluation Program
IAP	Incident Action Plan
ICS	Incident Command System
ICTAP	Interoperable Communications Technical Assistance Program
INCM	Incident Communications Manager
INTD	Incident Tactical Dispatcher
ITSL	Information Technology Service Unit Leader
LMR	Land Mobile Radio
MAA	Mutual Aid Agreement
MOU	Memorandum of Understanding
NECP	National Emergency Communications Plan
NIFOG	National Interoperability Field Operations Guide
O-RAP	Operational Rapid Assistance Package
PACE	Primary, Alternate, Contingency, and Emergency
POC	Point of Contact
PSAP	Public Safety Answering Point
RADO	Radio Operator
REMCDP	Rural Emergency Medical Communications Demonstration Project
RF	Radio Frequency
SME	Subject Matter Expert
SOG	Standard Operating Guidelines
SOP	Standard Operating Procedure
SVSR	Site Visit Summary Report
SWIC	Statewide Interoperability Coordinator
TA	Technical Assistance



Item/Acronym	Definition
TICP	Tactical Interoperable Communications Plan
TTX	Tabletop Exercise
UHF	Ultra High Frequency
USFS	US Forest Service
VHF	Very High Frequency
WAHR	West All Hazards Region
WESTCO	Western Colorado Regional Dispatch Center
WRETAC	Western Regional EMS and Trauma Advisory Council
WRHCC	Western Region Healthcare Coalition

