



Pacific NorthWest  
Economic Region



## CRITICAL INFRASTRUCTURE REENTRY AND SITUATIONAL AWARENESS USING UAS WORKSHOP

Tuesday, May 7, 2019  
Seattle, WA

### Welcome, Administrative Announcements, and Introductions

Public and private stakeholders from around the region met in Seattle, Washington to discuss the use of Unmanned Aerial Systems (UAS) improve situational awareness of critical infrastructure post-disaster. 86% of the nation's critical infrastructure is owned and operated by the private sector. Therefore, there is a need for rapid damage assessment of these critical infrastructures immediately following a disaster. Emerging drone technology is allowing for an expedited and detailed damage assessment of infrastructures by owners and operators. The private sector needs to access to disaster zones to conduct damage assessments and then be able to share information rapidly with state emergency management agencies so that a common operating picture can be established.



*The Workshop was designed to encourage participants' interaction and information sharing through tabletop discussions.*

This effort brought together many sectors including; law enforcement, emergency management, transportation, communications, emergency services, fire, as well as private sector agriculture and infrastructure such as energy, communications, power and utilities. Eric Holdeman, Director for the Center for Regional Disaster Resilience, started the workshop by greeting attendees and facilitating introductions of all participants who were present. Workshop participants were briefed on the Pacific NorthWest Economic Region's Center for Disaster Resilience and the grant received from the DHS National Infrastructure Protection Plan Challenge Grant program. This grant provided the funding to hold the day's workshop in Seattle, Washington.

This is the second Resilience Challenge Grant awarded to the Center for Disaster Resilience (CRDR). The 2017 Resilience Challenge focused on the applications of unmanned aerial systems in conducting damage assessments of critical infrastructure following a disaster.

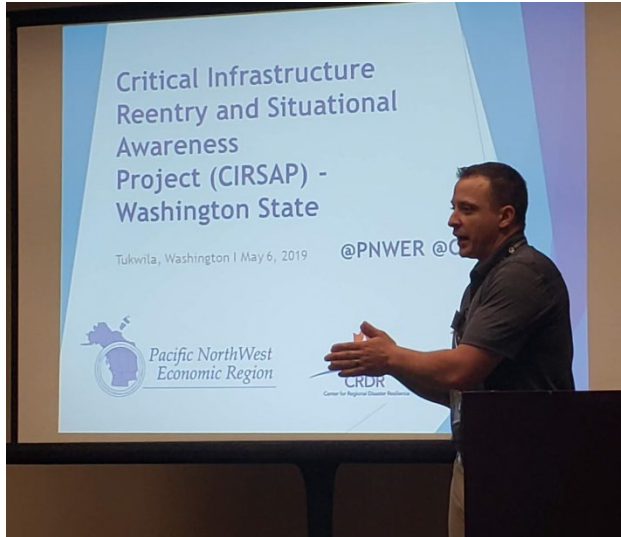
Emerging UAS technology allows for an expedited and detailed damage assessment of infrastructure such as bridges and other steel and concrete structures within the built environment. In partnership with Northeastern University, this project investigated the technical capabilities of UAS to enhance the efficiency, fidelity, speed and safety of current critical infrastructure inspection methods by using machine intelligence. The policy, legislative and regulatory opportunities and hurdles were also identified.

The CRDR has conducted numerous workshops on utilizing drones and a webinar on steps local governments need to take to establish a drone program. The CRDR Drone Users Group was established as an informal forum for the sharing of information between participating personnel and organizations. Resources developed by the CRDR and outside entities are also shared to Users Groups members. Past reports, news, and resources are available at <https://www.regionalresilience.org/uasuav-project.html>.

The Washington workshop is a continuation of past work. The 2019 Resilience Challenge Grant project seeks to develop methodologies to allow for the rapid inspection of critical infrastructure in post-disasters using drones and how this information can then be shared with state level emergency management agencies to establish better situational awareness and a common operating picture.

### **FAA: Update on status of drone/UAV regulations and procedures**

Mike Lizarraga, Special Agent, Law Enforcement Assistance Program, Office of National Security, Federal Aviation Administration provided an overview on federal UAV regulations.



*Mike Lizarraga, Special Agent, Law Enforcement Assistance Program, Office of National Security, Federal Aviation Administration*

FAA views drones as an aircraft and airman; for regulatory standards they are no different than a Cessna and a pilot. The concern is airspace safety and public safety.

Currently, you must apply for waivers from the FAA to operate drones at events. Regulations on flying over people and out of line of sight are not scheduled to change. The number of UAS crashes compared to number of fixed wing crashes is exponentially higher so these regulations are not going to change soon. However, as public safety entities can get exceptions to fly at night or out of line of sight. It is a difficult process to obtain a waiver.

The FAA signed reauthorization act in 2019 but it did not access Part 107 which concerns problems from hobbyists. As drone programs expand, agencies receive negative public opinion. Currently, the FAA controls airspace one inch above the ground but people continue to call in with complaints. Many states are writing preemptive regulations but if taken to federal court, those laws will be thrown out.

Emergency temporary flight restrictions prohibit drone access. Critical infrastructure operators need to call to check if they can access an area when a temporary flight restriction is enacted. The audience suggested a pre-registered list of critical infrastructure operators will be useful.

Countering drones is still not an approved method of use despite DOD and other similar agencies employing counter measures. UAS is protected under Federal Title 22 designating it a crime to interrupt flight operation. They are starting to employ a passive UAS system at CenturyLink stadium but it's not perfected or approved for usage.

Question and Answers:

Question- Who regulates land over tribal land?

Answer - The FAA

Question - Could there be a regional office to obtain a waiver?

Answer - A solution could be filing a notice into Low Altitude Authorization and Notification Capability (LAANC) and push it as an emergency to get priority.

Patrick Wright with Washington State Department of Transportation - Aviation Division explained WSDOT is working on a regional management plan for state UAS usage. When a temporary flight restriction is implemented, any waivers will go to WSDOT to improve mission assignment.

Wright stated that it's about priorities of who gets to fly. Priority will be life sustaining activities. If there is a TFR in place, WSDOT will work with FAA and all actions will be coordinated through the State EOC and Web EOC. An example situation is the California wildfires where they were trying to fit many aircraft in a small space. It was questioned if there was a preferred list for critical infrastructure operators. FAA explained that it is mission dependent. Wright says planning starts on the city, county level and feeding into the state. WSDOT is working with the counties to make sure the air fields are important pieces of critical infrastructure.

The last point was that the FAA branch responsible for approving waivers has a small staff covering nationwide. It's a complex and slow process.



Tom Hagen, Executive Director, Association for Unmanned Vehicle Systems International (AU VSI)

### Current Drone Usage

Tom Hagen, Executive Director, Association for Unmanned Vehicle Systems International (AU VSI)

The attitude towards drones has shifted over the past 5 years. There are many more applications for drones and the public and private sector are starting or expanding their drone program.

There were several legislation bills in Washington recently. One would have put an excise tax on drones another focused on education. HB 5138 would have required UAS registration but died in committee. Most bills die in committee in Washington.

The federal UAS integration pilot program designated ten sites nationally. No applicants from Washington were selected. The FAA symposium in June will discuss progress. An exciting application is in medical supply and package delivery and we look forward to progress on these fronts.

A few initiatives include the Trusted Operator Program. It acknowledges that commercial operators require different skills in operating a drone under a bridge in Seattle versus in an open field. AUVSI also works on workforce development and growing a UAS ecosystem in Washington.

## Tabletop discussion: Current and Future UAV Use

Participants were led through tabletop discussions around current drone use and barriers impacting use. Select comments are reported below.

- Does your organization use drones?
- What applications would be valuable?
- What barriers are preventing drone adoption?
  - Technical knowledge
  - Financial constraints
  - Regulatory uncertainty
  - Organization hesitation
  - Public opposition



*Eric Holdeman, CRDR Director leads tabletop discussion on UAS applications in use by workshop participants*

### Selected Comments -

**Media Representative:** Collaboration is important between public agencies and private users. Drones are a tool that will be expanding in Seattle by the media. We use drones as a tool.

**Energy Infrastructure:** Drones are used for mapping, assessing geological hazards, and clearing housing developments. They operated

over 1000 flight hours in only a year and a half but it was a long process to get approval from organization leadership.

**Law Enforcement:** A few years ago, a local sheriff's office wanted to purchase a drone with funding from a DHS grant. This spurred the county to develop a county-wide policy so there wouldn't be dozens of different policies. The focus was on safety and legality. The county reached out to entities that already had a drone program to learn best practices. The policy was passed through the county board of commissions and received a public hearing but did not receive much public comment. The sheriff department uses a couple of drones; public works

contracts the use of one for paving work but may purchase their own. The country realized that emergency management didn't have the capacity to manage all these drones so assisted departments in building their own capacity. In an emergency, these resources can be utilized for situational awareness.

Utility: The drone program started two and a half years ago when they first purchased drones and realized they should have started a proper program with regulations first. Drones are used to inspect transmission lines, encroachment in reservoirs, and dam inspections. They cut down time and improve safety. Data is more than just a picture but the challenge is making sure data is classified and tagged. They are working with the public disclosure team on properly storing data and developing a website where operators can log in and search for applicable data.

The biggest issue has been working with the culture and getting the mindset that this isn't a toy but a tool and importantly not a tool that will take away their job. Relaying the tech benefits is key.

Fire: A local fire department didn't originally have funding for a drone but there was interest and two have been procured. Today in fact there are doing training on wildfire and there have been a few search and rescue operations.

Homeland Security: DHS is concerned about the security aspects and using drones on soft targets.

First Responder Network Authority: FRNA is working on sending drone video to first responders. The question is how to prioritize data to first responders on the ground.

#### Additional Take-Aways:

- Wait to buy a drone until you understand the regulations both external and internal.
- The federal pilot is scheduled to finish by 2020 and will provide high amounts of data and lessons learned. This will expedite regulatory changes; because of the breadth of new applications we will see a lot of progress especially in unmanned traffic management.
- Alberta and North Dakota have promoted the economic development of drone usage. In North Dakota, the Governor is focused on rural economic development and broadband expansion. His initiative with the Western Governors Association is the changing face of rural economic development and wants to make the state the place to go to test drones.

## Domestic Operations Awareness & Assessment Response Tool

William Joseph Marler, TSgt, Washington Air National Guard

Richard E Little, 1SG, Washington National Guard

Domestic Operations Awareness & Assessment Response Tool, DAART, is a responsive situational awareness operated by the Washington Air National Guard. The objective is to facilitate the gathering of information (reporting or video) and tie it to geospatial coordinates.



*Washington Air National Guard provided a walk-through of DAART to workshop participants.*

This aids analysis of emergency situations by giving vetted stakeholders access during an incident.

The tool is a web-based database backed up by servers with unlimited capacity. Anyone in the workshop room can access it by requesting a log-in. This system was developed by many desperate partners to function as a place where that imagery can be deposited and people can access via username and password. Data can be tied to events like the Oso mudslide or specific wildfires. The National Guard is going out to share this system and make sure it works for emergency management needs.

DAART is a great tool to collaborate in a small or large event. It can also be used for training. You can use program in training event. There is also a mobile app. DAART is designed to be more accessible than Web EOC.

TSg Marler demonstrated uploading data to DAART and explained specific features. There is a main screen with a list of events. Usually state ECO will create an event. The DAART dashboard offers a higher level management. A lot of information is available but it's designed to be simplified. GIS layers can be turned on or off. Or users could select "chemical manufacturing" and local facilities will pop up. A chat function is also available.

Map layers stores data. Also, different organizations can create their own files and upload products and info they want to share with the rest of the community.

Missions can be created to feed live stream directly or later upload. Other people can come in and watch the feed. IT's possible to take notes/bookmarks within video. Prioritization can be decided and security measures include pre-approval, secondary passwords, or limit access to specific designated users. Post event, data is stored on servers. Washington State is beginning discussion on operationalizing DAART and it will be featured in the upcoming drill with PNWER.

## **Business and Damage Assessment Reentry Program**

Brian Laughlin, Planning Strategist at Washington State Emergency Management Division

When there is an incident, the local law enforcement officials can call state EOC or local EOC to check which private sector is registered to access facilities. This is a way to help local incident commanders manage access. Right now, you can go to the ACCESS website to view the CONOPS. There is a lot of documentation. The State is hiring a new outreach person soon to manage this program.

## **Tabletop Report-out on proposed CI Reentry and Sit Awareness CONOPS**

### **How is access granted to CI sites post-disaster?**

- Credentialing: Post tornado in Port Orchard, a site coordinator that set up and credentialed all workers before coming into site.
- Red Cross was primarily responsible for credentialing during 9/11 and through FEMA, Red Cross is mainly responsible for credentialing in all disasters.
- Utility: There is not a special process set up besides the standard identifying of people as they come in.

### **Methods of obtaining sit awareness of infrastructure**

- Airports: Probably use WebEOC. Updates from airports comes through State EOC. It is important for counties or local jurisdictions to make sure they keep their information updated. The state is focusing on the thirty priority airports, not all 120+.
- Utility: Situational awareness is obtained with a SCADA monitoring system monitored by a 24 hr ops center. If there is an apparent issue, use physical verification.
- Energy: Situational awareness is obtained with a SCADA monitoring system. If power goes out, physically have to send people out to close valves. There is a backup generator for SCADA system so they can always know the status of the pipeline at least but there are no generators for closing valves.



- Interdependencies are significant; hopefully there will be funding to complete the fuel prioritization plan.

### **Data Format and Transmission**

- There is difficulty downloading the software/app especially when time is important. It would be more useful if raw data is filmed then shared out to people.
- Local transportation agency learned during bridge inspections to point the camera up to protect privacy and take pictures to avoid public requests for film.
- The City of Seattle has approval for infrastructure uses but hasn't purchased a drone or decided to use a contractor.
- Utility has data scientists analyzing the data and machine learning is processing video imagery to identify people then deleting the image. The publicly available ML systems aren't sophisticated enough to identify power poles. The issue is sizing. Compressing images saves space but obscures details.
- UPAD is a product for anybody that needs that information. Entities should put in that request into state EOC which are ranked by priority. Using FEMA categorization can speed the request process. The state will decide if the request will be allocated to the guard or go to UPAD.
- Contact your local emergency manager and they will raise the issue.

Participants were asked if a red, amber, green coding system to classify infrastructure status would be appropriate. It was pointed out that bridges could have weight restrictions so the nuances might not be conveyed. However, a color coded system could quickly show you where to focus your energy.

It was pointed out that the University of Washington conducted a deep dive analysis into situational awareness during Cascadia Rising and it was clear there was not good situational awareness.

### **Drill:**

A full scale drill is cost prohibitive for police and infrastructure operators. Instead a functional exercise will determine how to manage raw data from a drone.

### **Key Take-away**

We should be working toward a preferred critical infrastructure drone user list that is worked into the WA state airspace plan.

**Next Steps – PNWER will conduct an exercise with Washington Emergency Management, law enforcement and a utility to test the CONOPS for accessing a disaster zone. The exercise will take place in September 2019.**

### **Concept of Operations (CONOPS)**

Participants discussed the necessary features of a CONOPS to access damage of critical infrastructure using UAS. Based on the discussion during the workshop and consultations with other stakeholders, the following CONOPS was developed. The CONOPS will be tested during a demonstration drill with Tacoma Power, Olympic Pipeline, State EOC, and the State National Guard.

## **Critical Infrastructure Disaster Access and Damage Reporting State of Washington Concept of Operations (CONOPS)**

### **I Introduction**

#### **1.1 Purpose**

The purpose of this CONOPS is to enable critical infrastructure owners and operators to have access to their infrastructures in post disaster scenarios. This will allow them to make a rapid damage assessment of their facilities. The second purpose of this CONOPS is to establish a criteria for reporting the status of infrastructures to the state emergency management Emergency Operations Center (EOC). Finally, if there is raw data, such as photos, video or other data that assists in better communicating the status of the damaged facilities, this CONOPS will designate the format and possible transmission methods for sharing that information back to the State EOC.

#### **1.2 Background**

86% of the nation’s critical infrastructure is owned and operated by the private sector. There is a need for rapid damage assessment of these critical infrastructures immediately following a disaster. Emerging drone technology is allowing for an expedited and detailed damage assessment of infrastructures by owners and operators. To accomplish this work requires that the private sector have access to disaster zones to conduct damage assessments and then be able to share information rapidly with state emergency management agencies so that a common operating picture can be established and shared appropriately.

#### **1.3 Scope**

This project scope includes the development of plans, procedures, processes, and mechanisms for the collection and exchange of damage information. This information will assist both infrastructure owners and the public sector to obtain faster situational awareness on the status of their infrastructures, and other interdependent infrastructures that may impact their ability to provide services, and products to their customers. This information will be transmitted to state EOCs and used to create a common operational map that can be shared with the federal government, lower level jurisdictional organizations and the private sector.

A public-private workshop was conducted. At this workshop, sessions were held that invited public and private CI owners and operators to be briefed on and consider their needs and concerns about partnering with the government sector and their state. The outcome of the workshop provided for the initial formation of operational concepts are now incorporated into this CONOPS.

**Note for Washington State:** A follow-on drill is to be conducted to physically test the operational concepts provided for by this CONOPS.

## **1.4 Objectives**

- Document the process whereby critical infrastructure owners and operators can gain access to their facilities located in disaster zones that may be located in areas that are sealed off from the general public by law enforcement.
- Designate a simplified reporting format whereby infrastructure owners and operators can report the operational status of their infrastructure facilities.
- Establish communication pathways and file formats for the transmission of raw data, as appropriate, that amplifies and perhaps clarifies the extent of damages to said infrastructure.

## **2 Options for Gaining Access to Critical Infrastructure in Disaster Areas**

### **2.1 Law Enforcement Control of Access into Disaster Zones**

Disaster zones are often sealed off post disaster at the direction of government officials at all levels of government. This is done to protect property and facilities that have been evacuated due to a disaster. When this occurs, traditionally this task is performed by law enforcement agencies at the city, county and state levels. During large scale disasters they may be assisted in this security task by the National Guard.

The senior law enforcement officer for the department with this security task normally acts in concert with state and local emergency management authorities, or in some cases as part of a specific Incident Management Team (IMT), discussed below.

When infrastructure owners and operators need access to their facilities that are located in secured areas, they must work with the senior law enforcement officers, County Sheriffs and Police Chiefs to gain access. This can be accomplished by working through an established local EOC that has local law enforcement liaisons present to coordinate the specific access point for entry by infrastructure owners, the route to the infrastructure and likely the exact destination and location of the infrastructure.

Crews who are allowed access into disaster zones must abide by all the stipulations placed upon them by law enforcement, e.g. single points of entry and exit from the disaster zone and means and methods for communicating their location and status to the appropriate EOC or command center designated by the law enforcement agency.

There may be additional requirements for all staff entering a disaster zone to have a written pass/authorization from established by local law enforcement and special identification for vehicles operating within the disaster zone.

The emphasis on gaining access is to provide for the safety of individuals entering the disaster zone, accountability of personnel and vehicles/equipment operating within the disaster zone and compliance with all reporting requirements established by the law enforcement agency.

## **2.2 Areas under the control of an Incident Management Team (IMT)**

For many disaster situations it will be possible that an IMT is established to manage the field response to a disaster. In the past, wildland fires have been the typical use for IMT organizations. The usage of IMTs has expanded for other disaster response operations that could include search and rescue, recovery operations, flooding, or in one well documented case a large mudslide.

## **2.3 Direction and Control under an IMT**

In a situation that has an IMT in charge of the disaster response it is the Incident Commander who has the ultimate authority for all operations that occur within the designated disaster area and for granting access into disaster zones. Infrastructure owners and operators must contact the individual IMT command center to coordinate their entrance into a disaster area. All protocols established by the Incident Commander must be followed. Normally this will require anyone entering a disaster zone to also report their exit from that zone when their work is completed.

State Emergency Operations Centers (EOC) can assist infrastructure owners and operators in identifying the specific IMT and its location where coordination will be required. Note that the use of drones to conduct inspections within areas controlled by an IMT needs to be clearly communicated and approved by the IMT, integrating their use into their air operations plans.

## **3 Infrastructure Damage Reporting**

### 3.1 General

The impact of disaster damages to our modern business and supply systems can be catastrophic to our ability to function as a society. Public health and our overall economy can be decimated by the lack of a functional infrastructure system that provides electrical power, communications, transportation, liquid fuels, water and waste-water services to name only a few of the major infrastructures.

It is critical to have good situational awareness on what infrastructure systems are functional, those that are functioning at a less than optimal level and then those that are either off-line or perhaps even destroyed. Having this information will assist in establishing a common operational picture.

Reporting on the status of infrastructure will initially be scarce, but with teams forming and organizations getting organized to respond, the amount of information available on the status of infrastructure will escalate rapidly.

It will be important to have a system which enables the operational status of critical infrastructure to be reported easily and provide a “snapshot” of the status of the infrastructure.

### 3.2 Rapid Damage Reporting—Color Coded System

In order to rapidly communicate the status of infrastructures a color coded system will be utilized. This system of reporting focuses only on the operational status of the infrastructure and not what the specific issue is that is causing the rating to be applied to the damage. The judgement on what the status of the color code is made by the inspector on the ground using their individual expertise to make such a judgement call. This rating system does not provide detailed information on the cause of the rating or why a system receives a specific rating.

#### Rapid Damage Reporting – Color Coded System

Green	Yellow	Red	Black
Fully Operational	50%-80% Operational	Not Operational Repair Needed	Destroyed Major Damage

Information is likely shared back to a parent organization which will consolidate information for a series of individual inspections for disasters that are regional in nature, such as an earthquake, wildfire or major flooding. It is possible that there is a single event at one specific location that is impacting critical infrastructure. The same process of reporting will be followed.

### **3.3 Sharing of Raw Data of Damages**

It is not unusual for persons receiving reports about damages to have trouble comprehending the extent of the disaster and the damages that have occurred. Besides the use of the color coded system described above it may be advisable to provide additional information when possible on infrastructure damages by transmitting photographs or video, that clearly depict and clarify the extent of the damages. For instance, this photo immediately explains the extent of damages to a tower carrying electrical power lines. Note, every instance of infrastructure damage does not need to have photographic or other information shared.

### **3.4 Communicating Damage Information to the State EOC**

The transmission of infrastructure damage information should be made by any available means of communications that remains operational following a disaster. Typically, in a field environment this may include cellular phones followed by radio transmissions. In some cases it will require gathering data on the damages at an incident site and then inspectors relocating to a position where telecommunications systems remain operational. It is possible that early in a disaster information will have to be transmitted by messenger if all telecommunications systems are inoperable.

Damage information is collected shared in the EOC.

See Appendix 1 for a list of the state EOC means of communications, to include the main EOC phone number, Duty Officer number, radio frequencies, call signs, and amateur radio means.

### **3.5 Sharing Infrastructure Damage Information—Establishing the Common Operating Picture**

Within the State EOC infrastructure damage information is gathered and displayed appropriately. This may include the use of status boards and maps, both physical and digital.

Infrastructure damages that are shared will improve situational awareness that will be incorporated into the establishing the common operating picture. This information is shared with appropriate individuals and organizations with a right to know. In most cases this will include senior appointed and elected officials responsible for the disaster response.

Information on infrastructure damages will be incorporated into regular EOC Situation Reports that are shared with other state agencies, local EOCs, IMTs and other critical infrastructure owners and operators who have dependencies or interdependencies caused by the infrastructure damages.

## **4. Use of Specialized Equipment for Infrastructure Inspections**

## **4.1 General**

We are now in an era that is beginning to use specialized tools to perform damage assessments. Traditional methods included using binoculars, human inspection (climbing a tower), and things like specialize bridge inspection equipment, e.g. bucket trucks.

Today many other tools are coming to the fore that provide for remote sensing, specialized sensors, e.g. drones, LIDAR, and even Artificial Intelligence (AI).

## **4.2 Use of drones for inspections**

A rapid expansion of the use of drones is happening across a wide range of governments, businesses and industry. They have become useful tools for the infrastructure inspections of towers, bridges, and railroad tracks, to name only a few uses.

One of the key benefits for using drones is the speed with which infrastructure can be inspected rapidly following a disaster. They can carry a variety of sensors that go beyond the traditional camera and geo-location. These sensors can assist in providing more specific information on the status of an infrastructure. We can expect a rapid expansion of systems and sensors as the technology evolves.

It is important that any organization planning to use drones for the inspection of infrastructure obtain the necessary permissions and comply with all federal regulations concerning the use of drones.



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## Critical Infrastructure Reentry and Situational Awareness Workshop – Washington State

May 7, 2019 | 8:00am to 12:30PM

- 7:30AM      **Registration and networking**
- 8:00AM      **Welcome and introductions**
- 8:10AM      **Overview of Critical Infrastructure Reentry and Situational Awareness Project**
- Eric Holdeman, Director, Center for Regional Disaster Resilience
- 8:20AM      **FAA: Update on status of drone/UAV regulations and procedures**
- Line of sight and flight over people regulations
- Mike Lizarraga, Special Agent, Law Enforcement Assistance Program, Office of National Security, Federal Aviation Administration
- 9:00AM      **Washington State Patrol UAS Program**
- Detective Sergeant Clint Thomas
- 9:30AM      **Current UAS Usage**
- Tom Hagen, President, Enterprise Initiatives Consulting
- 9:35AM      **Tabletop discussion: Current and Future UAV Use**
- Does your organization use drones?
  - What applications would be valuable?
  - What barriers are preventing drone adoption?



- Technical knowledge
- Financial constraints
- Regulatory uncertainty
- Organization hesitation
- Public opposition

Report Out

10:00AM Break

10:15AM **Domestic Operations Awareness & Assessment Response Tool**

- William Joseph Marler, TSgt, Washington Air National Guard
- Richard E Little, 1SG, Washington National Guard

10:35AM **Business and Damage Assessment Reentry Program**

- Brian Laughlin, Planning Strategist at Washington State Emergency Management Division

11:00AM **Tabletop discussion on proposed Critical Infrastructure Reentry and Situational Awareness CONOPS**

**1. Current local access process**

- How is access granted to critical infrastructure sites post-disaster?
- Which agencies are responsible for granting permission?
- How do you verify out-of-state workers? For example, if driving in non-marked vehicles?

**2. Methods of obtaining situational awareness of infrastructure**

- How is the status of critical infrastructure currently determined?
- What tools are currently used or could be used to determine the status?

Examples:

- Drones or other remote sensing technologies
- Visual inspection
- Company reports based on outages detected by their operating systems, e.g. an automatic shutdown of a pipeline that loses pressure

**3. Data Format and Transmission**

- What data do you need? How can the data be most usable?
- What format is most useful to transmit data?

- What format would contribute to a state-wide situational awareness picture?
- How would you shift through data as managing massive amounts of raw data is burdensome?
- Could you share a live feed?
- What are the points of notification for incident information or routing of information?
- How could you include estimated time for infrastructure to be restored (hours, days, weeks)
- Would a dashboard (Red, Amber, Green) or other display of damages be useful?

Example:

- Red signifies non-operational infrastructure
- Amber signifies infrastructure is still operational but not at full capacity
- Green signifies infrastructure is operational

12:00pm      **Report out**

12:30pm      **Wrap up and next steps**