• Due to the large attendance, all participants are muted for the duration of the session to prevent background noise.
  • Please use the Q&A functionality within Zoom for questions that are relevant to the whole group.
  • We will address these Q&A at the end of the webinar!

While you wait...
Answer a quick question on our 📊 Mentimeter
Using the QR Code or link.

Menti.com
Code: 49 90 27

**Poll Closed**
Today’s Objectives

• Learn how drones are transforming the landscape of disaster response missions nationwide.

• Learn from industry leaders on the keys to developing a successful public safety drone/UAS program in your agency.

• Gain an understanding of how your agency can leverage Civil Air Patrol and their drone capacity during a disaster.

• Hear the latest innovations in imagery collection, exploitation and artificial intelligence for imagery-derived disaster intelligence.
Hosts and Panelists

Tari Martin - Director, National and Federal, NAPSG Foundation

Charles Werner - Director, DRONERESPONDERS Public Safety Alliance

Austin Worcester - Senior Program Manager for sUAS, Civil Air Patrol

Christopher Todd – Executive Director, Airborne International Response Team
2:00-2:05 PM  Welcome – Tari Martin, NAPSG Foundation
2:05-2:20 PM  State of Drones for Public Safety – Charles Werner, DRONERESPONDERS Public Safety Alliance
2:20-2:35 PM  Leveraging Civil Air Patrol - Austin Worcester, Civil Air Patrol
2:35-2:45 PM  DRONES FOR GOOD™ Disaster Response Operations – Christopher Todd, Airborne International Response Team
2:45-2:50 PM  Next Steps
2:50-3:00 PM  Closing and Q/A
About NAPSG Foundation

Our Vision
A Nation of emergency responders and leaders equipped with the knowledge and skills in applying technology and data to change the outcome for survivors.

• 501(c)(3) Non-profit organization established in 2005
• +20,000 member network: Public Safety leaders, first responders, and GIS practitioners
• Board of Directors comprised of public safety & emergency management industry leaders
Local Focus – National Reach

• 20,000+ member network
• 12 primary national & international associations
• All disciplines
• All levels of government
• Private sector

Virtual Training participants with contact details redacted.
First Responders, Operators, and Decision Makers have access to and know how to use the right actionable information at the right time
How Do We Do It

Transferring knowledge and skills

Building capacity in using innovative technology

Fostering regional collaboration through implementation

Defining and promulgating consistent best practices

National Guidelines and Standards

Exercises & Simulations

Education & Training

Tech Assistance
https://www.napsgfoundation.org/all-resources/
Does your agency currently have a drone program?
The State of Drones for Public Safety

Chief Charles L. Werner (Emeritus-Ret.)
Director, DRONERESPONDERS Public Safety Alliance

DRONERESPONDERS.org
“Would you ever put your personnel or citizens in harms way unnecessarily?”
Thermal Imaging Operations
Camera View vs. Thermal Image View – Heat Signature DJI FLIR Zenmuse XT
Notre Dame Fire in France

*Drone was instrumental in saving the remainder of this historic building*
Major Traffic Accidents
Combining GIS & Digital Imagery
CHULA VISTA POLICE DEPARTMENT - DRONE AS A FIRST RESPONDER (DFR)

CHULA VISTA POLICE DEPARTMENT

* Selected as part of the IPP on October 2018

* First program in the nation using Drones as a First Responder (DFR). See FAA site

* Current status: DFR Pilot Program currently based from CVPD HQ with limited flight range of about 1 mile radius

* Common use of drones in Chula Vista: Drones as first responders, documenting crime and accident scenes, searching for missing or wanted persons, fires, and evaluating damage after a major incident or

TOP 5 CALLS RESPONDED WITH DFR ASSISTANCE

- Disturbance - Person: 117 (10.4%)
- Domestic Violence: 175 (15.56%)
- Psychological Evaluation: 181 (16.09%)
- Traffic Collision: 235 (20.89%)
- Assault: 417 (37.07%)

PLEASE SELECT A TIME FRAME

EARLIEST RESPONSE 10/22/2018 7:23:18 AM  
LATEST RESPONSE DATE/TIME 7/15/2020 3:06:14 PM

DFR ACTIVITY BY THE NUMBERS

TOTAL CALLS RESPONDED TO 2881

DFR ASSISTED ARRESTS 373

DFR DEPLOYMENT AVOIDED DISPATCHING A PATROL UNIT 687

DFR FIRST ON SCENE COUNT 1207

AVG RESPONSE TIMES - FIRST ON SCENE (IN SECONDS) * 108.66

AVG RESPONSE TIMES - ALL CALLS (IN SECONDS) * 141.99
Search and Rescue – Lost Persons

Drone Sent the Victim GPS point
45°40'56.6"N 73°50'37.3"W
Richmond VA Confederate Statue Protest – Pedestrian Traffic Deconfliction
HURRICANE HARVEY FLOODS BRAYS BAYOU, SURROUNDING AREAS
Alabama Tornado – Search & Rescue, Damage Assessment
Hawaii Volcano Monitor Lava Spread, SO2 Sensing & Evacuation
Law Enforcement Tactical Ops
Traffic Crash Reconstruction – 1/3 Time, Reduces Secondary Accidents
Train Derailment, Fire & Spill
Critical Infrastructure
Public Safety Vehicle/Portable Tethered Drones – Continuous Power

**FAA Compliant**
No piloting necessary; fully autonomous launching, flight, & landing

**Flight Time**
24 hours continuous (as long as truck is running or plugged into shore power)

**Camera**
Thermal stream resolution of 320x256/30fps with 5x EO digital zoom at 720p/30fps

FAA does NOT Require Remote Pilot
AT&T/FirstNet Flying Cell on Wings (COW) for LTE
Augmented Reality Overlay

- Power lines indication
- Personnel and equipment call signs
- Embedded street maps
- Engine 714
- Engine 717
- Jordan 7134
- O’Neal 7129

- Height: 20.83 m
- Distance: 37.58 m
- Battery: 45% (40 min)
Q18: Which of the following types of public safety UAS missions has your organization flown to date in 2020?

Answered: 248  Skipped: 41

<table>
<thead>
<tr>
<th>Mission Type</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crime Scene Investigation / Forensic Analysis</td>
<td>47.98%</td>
<td>119</td>
</tr>
<tr>
<td>COVID-19 Support</td>
<td>23.39%</td>
<td>58</td>
</tr>
<tr>
<td>Damage Assessment</td>
<td>45.97%</td>
<td>114</td>
</tr>
<tr>
<td>Incident Command and Control (Live Streaming)</td>
<td>52.42%</td>
<td>130</td>
</tr>
<tr>
<td>Hazardous Materials (HAZMAT) Response</td>
<td>20.97%</td>
<td>52</td>
</tr>
<tr>
<td>Mapping (non-forensic related)</td>
<td>45.97%</td>
<td>114</td>
</tr>
<tr>
<td>Public Information</td>
<td>41.13%</td>
<td>102</td>
</tr>
<tr>
<td>Target Search (including Search and Rescue)</td>
<td>56.05%</td>
<td>139</td>
</tr>
<tr>
<td>Security Overwatch (Surveillance)</td>
<td>41.53%</td>
<td>103</td>
</tr>
<tr>
<td>Structure Fire Response</td>
<td>39.52%</td>
<td>98</td>
</tr>
<tr>
<td>Special Event Planning</td>
<td>32.66%</td>
<td>81</td>
</tr>
<tr>
<td>SWAT-related</td>
<td>36.69%</td>
<td>91</td>
</tr>
<tr>
<td>Swift Water Rescue</td>
<td>12.10%</td>
<td>30</td>
</tr>
<tr>
<td>Training / Exercises</td>
<td>82.26%</td>
<td>204</td>
</tr>
<tr>
<td>Transportation of Cargo / Equipment</td>
<td>2.42%</td>
<td>6</td>
</tr>
<tr>
<td>Wildfire Response</td>
<td>18.95%</td>
<td>47</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>14.92%</td>
<td>37</td>
</tr>
</tbody>
</table>

Total Respondents: 248

AIRT-DRONERESPONDERS Spring 2020 Research Study Report
https://www.droneresponders.org/research
State of Public Safety UAS Programs 2020

- UAS Programs are more mature
- Flying more missions and more types of missions
- Increase in number of remote pilots

AIRT-DRONERESPONDERS Spring 2020 Research Study Report
https://www.droneresponders.org/research
How Drones Make a Difference in Public Safety

- Safety – Civilians & Responders
- Operational Effectiveness
- Situational Awareness
- Disaster Recovery
**Question:**
Operate under a COA or Part 107?

**Answer:**
BOTH - Provides Most Versatility

**Examples:**
Tactical BVLOS Waiver
Operations Over People
Night Operations
What’s Involved in Implementing a Drone Program?

It’s more than buying and flying!

STANDARDS

- ASTM F38 - [https://www.astm.org/COMMITTEE/F38.htm](https://www.astm.org/COMMITTEE/F38.htm)
- ASTM 3379-20 – Public Safety Remote Pilot Training Requirement - [https://www.astm.org/Standards/F3379.htm](https://www.astm.org/Standards/F3379.htm)
- ANSI UASCC STANDARD ROADMAP - [https://www.surveymonkey.com/r/WG2RPBR](https://www.surveymonkey.com/r/WG2RPBR)
JOIN and access the largest online collection of Public Safety UAS documents (SOPs, Best Practices, Lessons Learned, Training Info and more)

droneresponders.org

Please register on the website (it’s FREE)

DRONERESPONDERS.ORG
Contact Information

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Charles@DRONERESPONDERS.org

Mobile: 434.825.5402
Participant Poll

How is your agency currently using imagery in preparedness, response, recovery and/or resilience efforts?

Answer a quick question on our Mentimeter
Using the QR Code or link.

Menti.com
Code: 49 90 27

**Poll Closed**
Civil Air Patrol
United States Air Force Auxiliary

CAP sUAS / Remote Sensing Use in Emergencies

Austin “Sauce” Worcester
Senior Program Manager, sUAS
National Headquarters
28 July 2020
About CAP

- Founded December 1, 1941
- Became the U.S. Air Force Auxiliary in 1947 with the birth of the U.S. Air Force
- In all 50 States, D.C., as well as Puerto Rico and the U.S. Virgin Islands.
- 66,000+ volunteer members supported by less than 200 full time employees
- Largest owner of single engine Cessna aircraft in the world – 570 aircraft
- Largest single owner of sUAS in the Nation – more than 1800 sUAS aircraft
CAP Fixed Wing sUAS in Use for AFAM

Event 38 – E 384
CAP Rotary Wing Aircraft in Use for AFAMs

INSTANTEYE MK 3 GEN 4

T960 WITH LIDAR
Puerto Rico Earthquake Ops
Imagery Collection from WaldoAir and sUAS

Potential Damage to Sewage Treatment Plant, Guanica, PR

Area of enlarged photos

Potential Buckling/Damage

Image: CAP/WalaoAir, c. Jan 21 2020
Hurricane Maria Recovery Linear Feature Imaging for Powerline Surveys of Puerto Rico
Waldo Air XCAM - R Sensors
Puerto Rico Earthquake Ops
Guayanilla Warehouse Collapse Lidar Image
Puerto Rico Earthquake Ops
FEMA Lidar Analysis

Vertical difference highlighted above in orange identifying the difference between lidar data collected after Hurricane Maria 2018 and the 2020 Puerto Rico earthquake.

Green line is 2018 data and red line is from 2020
Arkansas Tornado Remote Damage Assessment Using AI
Arkansas Tornado Remote Damage Assessment Using AI
Arkansas Tornado Remote Damage Assessment Using AI
Questions & Contact Info

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Emergencies – Contact our National Operations Center
24/7/365: 888-211-1812
opscenter@capnhq.gov
DRONES FOR GOOD™
DISASTER RESPONSE OPERATIONS

Presented by Christopher Todd CEM, FPEM
ABOUT

1. 501(c)3 non-profit organization.
2. Founded 2017 in Miami, Florida – the heart of hurricane alley.
3. Offer aerial intelligence capabilities for disaster management and special projects focused on sUAS and GIS.
4. Producer of world-class content and events focused on Drones For Good and Public Safety UAS.
5. Official home of the DRONERESPONDERS program.
Q28: How important is the ability to track and understand how different public safety organizations around the world are using Drones For Good?

Answered: 243    Skipped: 46
KEY FINDING #20

97% of survey respondents believe the ability to track and understand how public safety organizations around the world are using Drones For Good is important.
HURRICANE RESPONSE  |  TYPICAL MISSIONS

1. Situational Awareness and Public Information (How bad is Bad?)
2. Target Search (and rescue)
3. Damage Assessment
4. Damage Mapping and Documentation
5. Power Restoration
6. Telecommunications Inspection
7. Insurance Claims (and FEMA Reimbursement)
8. Delivering Aid and Relief Supplies (emerging use cases)
HURRICANE RESPONSE | LESSONS LEARNED

2017: IRMA (South Florida)
   - Logistics are essential for success.

2018: MICHAEL (Florida Panhandle)
   - Maintain a CONOP for disconnected environments.

2019: DORIAN (Northern Bahamas)
   - Relationships and flexibility are paramount.
HURRICANE DORIAN | NORTHERN BAHAMAS

Freeport and Eastern Grand Bahama Island
- Partnered with FL Region 7 AHIMT
- University of the Bahamas
- Residential Areas
- Building goodwill on the fly is essential for success

Marsh Harbor, Great Abaco Island
- The Mud (Shantytown)
- Empathy and respect. Not a photo op. Act as if.
1. Field test of Pix4Dreact beta version.
2. Rapid processing under austere conditions.
3. Establishing workflow sequencing is essential.
   A. What is the desired output for end user?
   B. Remote sensing capabilities?
   C. Aircraft range?
   D. Number of flights/batteries?
   E. Recharging capacity?
   F. Airspace authorization and deconfliction?
TIPS FOR SUCCESS

1. Aerial imagery without GIS intelligence is nothing more than disaster art.
2. Your end-product becomes a math equation. Work backwards to determine key variables.
3. You can’t be an expert in everything. Know your strengths and weaknesses. Fill the gaps.
4. Train and exercise your workflow or you will waste time and resources.
CONTACT

Christopher Todd
Executive Director
ctodd@airt.ngo
Call to Action

*How can you prepare now to use drones and imagery for a future incident?*

Where do you start?

- Join nationwide grassroots public safety UAS Initiative - [www.DRONERESPONDERS.org](http://www.DRONERESPONDERS.org)
- Gain experience and hone your skills volunteering as a GIS analyst or field manager with the Airborne International Response Team (AIRT). More info at [http://airt.ngo](http://airt.ngo)
- Locate your local Civil Air Patrol Unit - [https://www.gocivilairpatrol.com/](https://www.gocivilairpatrol.com/)
- Consult the research community to advance your capabilities - [https://uas-test.umd.edu/](https://uas-test.umd.edu/)
How is your agency currently using imagery in preparedness, response, recovery and/or resilience efforts?
Call to Action

Technical Resources

- Incident Imagery and Use-Cases
- **FEMA's Remote Sensing Resources Hub**
  [https://gis-fema.hub.arcgis.com/pages/remote-sensing-resources](https://gis-fema.hub.arcgis.com/pages/remote-sensing-resources)
- Esri Platform
  - **Esri Imagery and Remote Sensing Data Collection** [Living Atlas & Premium Content](https://arcg.is/mfaKu)
  - ArcGIS Drone2Map [https://arcg.is/mfaKu](https://arcg.is/mfaKu)
  - Site Scan For ArcGIS [https://www.esri.com/videos/watch?videoid=bqLchJCW8jE](https://www.esri.com/videos/watch?videoid=bqLchJCW8jE)

Where can you get help from the community?

- Imagery and Remote Sensing GeoNet Community
  [https://community.esri.com/community/gis/imagery-and-remote-sensing](https://community.esri.com/community/gis/imagery-and-remote-sensing)
- US Disasters Community
  [https://community.esri.com/groups/us-disaster-community](https://community.esri.com/groups/us-disaster-community)
What's Next?

• Next PrepTech Talk:
  • August 13, 2020 - The Indoor Frontier: Exploring Emerging Technologies for First Responders in the Indoor Environment
  • September 10, 2020 - Verdict is Out: Decrypting Risk, Resilience, Social Vulnerability Data & Indices
  • October 2020 – Applying Drones & Imagery (Part 2)

• Events:
  • August 20, 2020 - Open Community Forum: COVID-19 Technology & GIS Hot Wash Series, Part 2
  • August 27, 2020 - EM Geo Forum: Wildfire Workflows and Considerations for Emergency Management

• InSPIRE
  • April 6-8, 2021 - Salt Lake City, Utah

https://www.napsgfoundation.org/events/
What's Next?

https://www.napsgfoundation.org/events/
Thank you!

Questions?

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Charles Werner charles@droneresponders.org

Austin Worcester aworcester@capnhq.gov
Christopher Todd ctodd@airt.ngo