



# DRONERESPONDERS

## UAS Applications for Incident Response

Chief Charles L. Werner, (Ret.)

Director, DRONERESPONDERS Public Safety Alliance

[DRONERESPONDERS.org](http://DRONERESPONDERS.org)



For more information, please contact  
Carolyn Blanton  
[cblanton@vtti.vt.edu](mailto:cblanton@vtti.vt.edu)

Save the Date  
November 14-15, 2019

I-81 Corridor Coalition  
Annual Meeting

Hilton Garden Inn  
900 Plantation Road  
Blacksburg, VA 24061



**“Would you ever put your personnel or citizens in harms way unnecessarily?”**



## Structure FireFighting





Thermal Imaging – FDNY 2<sup>nd</sup> Alarm or Greater – Tethered Drone





Thermal Imaging – Structure Fire in the U.K.





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



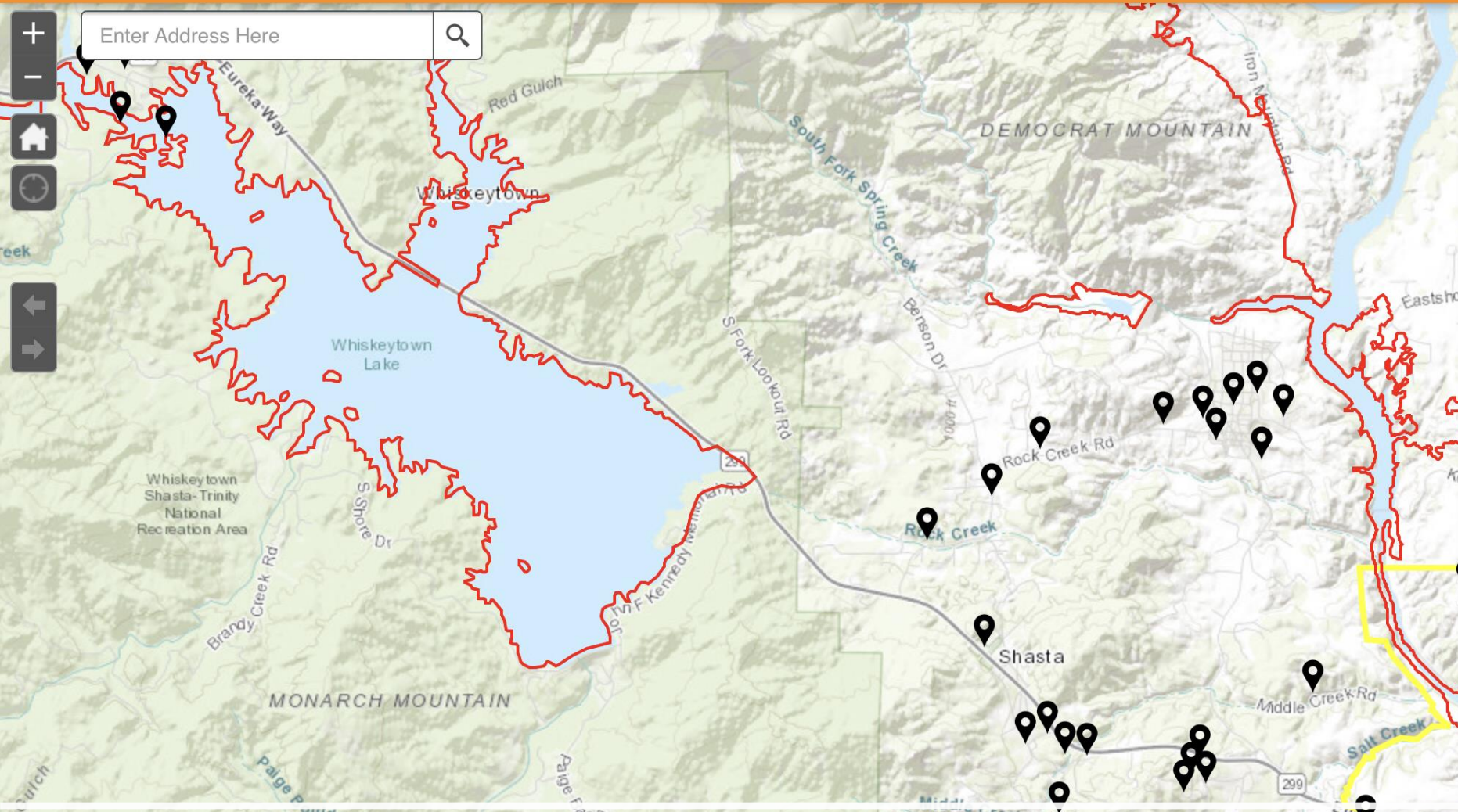




Hazmat Spill and Overwatch







## Information

**Click the push pins in the map to access the 360 degree aerial views.**

Because of high traffic volume to Hangar 360, you may experience slow load times for the 360 degree images. Please check back later.

When using smart phones to view the aerial, for ease of use, click the star icon at the bottom right of the screen to dock the aerial then manually navigate around to view.

### Credits:

Aerial photos were collected as part of a multi agency collaboration. Licensed UAV pilots from Menlo Park Fire District, Alameda County Sheriff, Contra Costa Sheriff, and other agencies assisted the City in capturing the aerial photos.

The City would also like to acknowledge CAL FIRE for permitting the use of UAV technology to assist in damage assessment.

# Combining GIS & Digital Imagery











- 1
- 2
- 3
- 4
- 5
- 6

Bille Rd and Skyway



# Camp Fire CA - Dashboard





# Overwatch of Technical Rescue

---





Locating Lost Person - UK



An aerial photograph showing a large, dense crowd of people gathered on a city street. The crowd is moving along the road, which is lined with parked cars and buildings. A rainbow flag is visible in the crowd. The word "RUPTLY" is overlaid in large, white, sans-serif capital letters on the left side of the image.

RUPTLY

Charlottesville VA – Unite the Right Rally





MODE P-GPS        71%

Richmond VA Confederate Statue Protest – Pedestrian Traffic Deconfliction

H:307.7ft

D:1982.9ft

Az:152

H.S: 0.0mph

V.S: 0.0mph

# HURRICANE HARVEY FLOODS BRAYS BAYOU, SURROUNDING AREAS





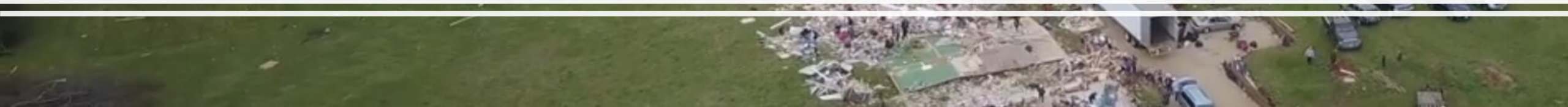


Chesterfield VA Tornado





Elon VA Tornado







Alabama Tornado – Search & Rescue, Damage Assessment







Hawaii Volcano Monitor Lava Spread, SO<sub>2</sub> Sensing & Evacuation



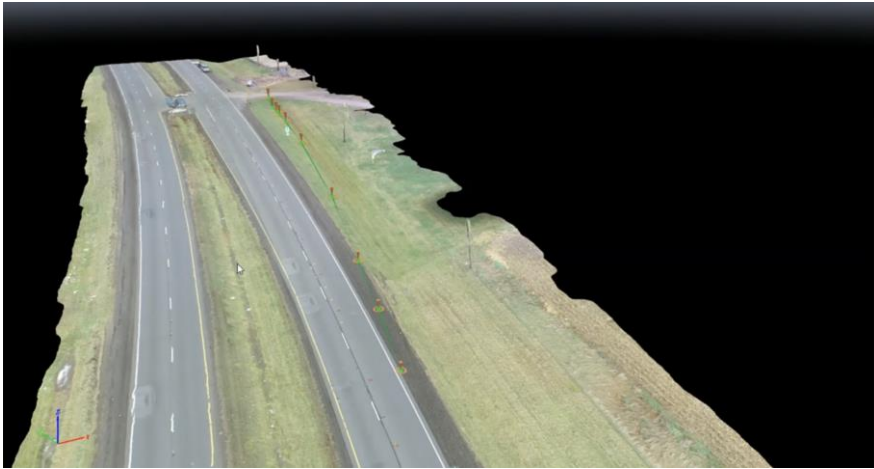




# Law Enforcement Tactical Ops

---





Traffic Crash Reconstruction – 1/3  
Time, Reduces Secondary Accidents

---





Snow Rescue Patrol





---

Lost Skier Located by Drone

---





## Hazmat Operation





# Train Derailment, Fire & Spill





Hazmat Sampling From Drone





Critical Infrastructure





Critical Infrastructure





Drones To Inspect Bridges







# Automatic External Defibrillator

---





Medical Supplies to Remote Areas



Blood

# Medical Transport



Human Organs





Drone to Access Interior Hard to Reach Areas





# CHULA VISTA POLICE DEPARTMENT - DRONE AS A FIRST RESPONDER (DFR)

## CHULA VISTA POLICE DEPARTMENT DFR PROGRAM FACTS

\* Program was established December 2015

\* 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

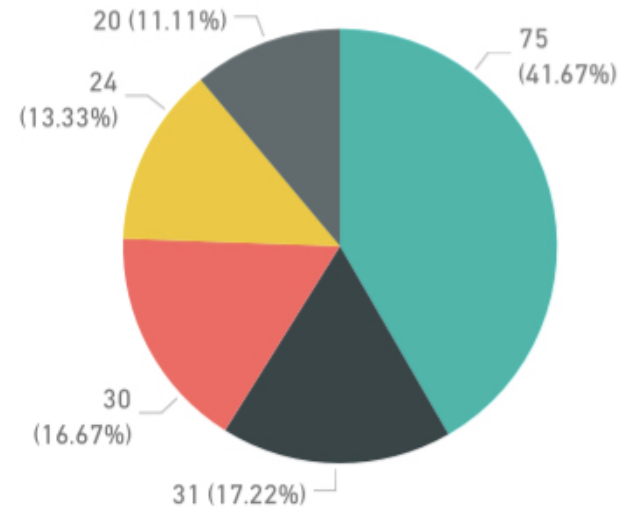
\* Common use of drones in Chula Vista: Drones as first responders, documenting crime and accident scenes, searching for missing or

wanted persons, fires, and evaluating damage after a major incident or

## TOP 5 CALLS RESPONDED WITH DFR ASSISTANCE

Call Type

- Disturbance - Person
- Traffic Collision
- Domestic Violence
- Psychological Evaluation
- Check a Person's Well Being



PLEASE SELECT A TIME FRAME

Y Q M  
Month

Oct 2018 - Apr 2019

Oct Nov Dec Jan Feb Mar Apr

## DFR ACTIVITY BY THE NUMBERS

TOTAL CALLS RESPONDED TO

387

NUMBER OF ARRESTS

56

DFR DEPLOYMENT AVOIDED  
DISPATCHING A PATROL UNIT

47

DFR FIRST ON SCENE COUNT

173

AVE RESPONSE TIMES - FIRST ON  
SCENE (IN SECONDS)

111.57

AVE RESPONSE TIMES - ALL CALLS

(IN SECONDS)

# Chula Vista CA – Drone as a First Responder

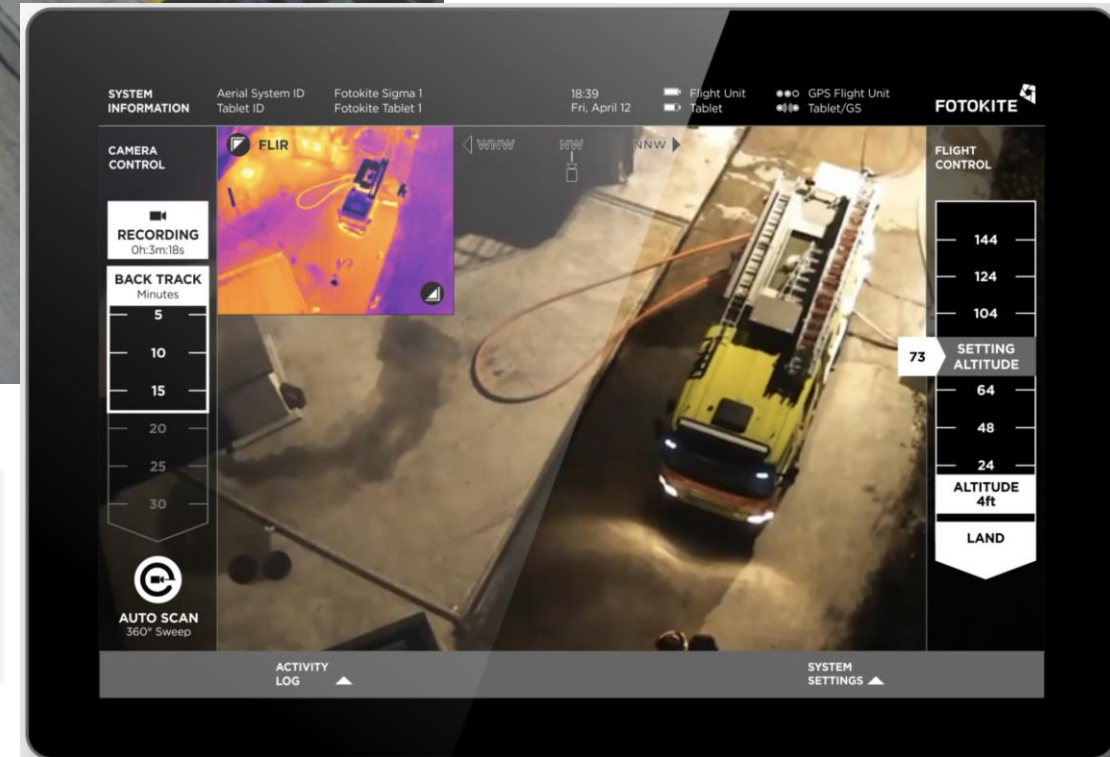
EARLIEST RESPONSE

10/22/2018 7:23:18 AM

LATEST RESPONSE DATE/TIME

4/3/2019 4:28:26 PM





## 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

Public Safety Vehicle/Portable Tethered Drones – Continuous Power, Does NOT Require Remote Pilot





AT&T/FirstNet Flying Cell on Wings (COW) for LTE



◀ **Wind indication**



CITY 110V 2504

◀ **Power lines indication**

HEIGHT  
20.13<sub>m</sub>  
DISTANCE  
37.58<sub>m</sub>

BATTERY  
45%  
40<sub>min</sub>

**Personnel and  
equipment call signs** ▶

ENGINE 714

ENGINE 717

MAIN ST.

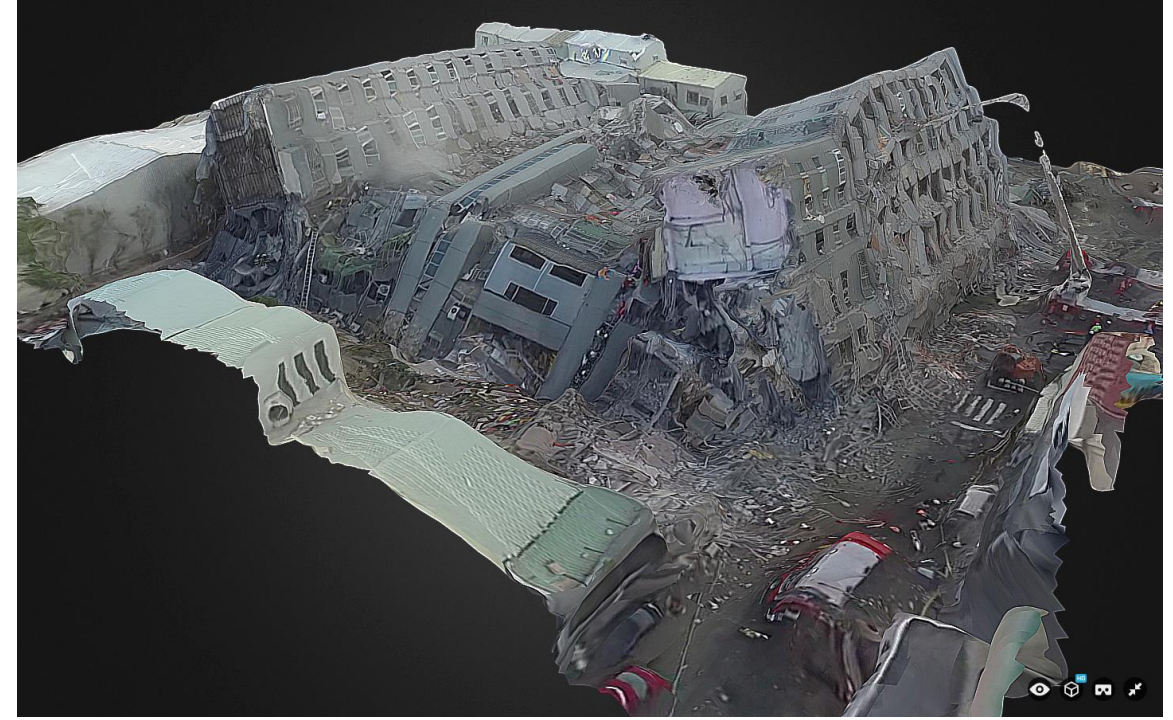
Augmented Reality Overlay

Embedded  
street maps

32°2'58.833" N  
34°46'7.447" E  
352°  
N

20.07.2016 10:55:37



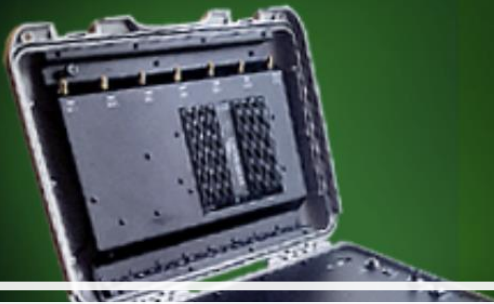


# 3D Mapping & VR Taiwan Earthquake





BROADCAST  
VIDEO & DATA



SHARE & MA  
VIDEO & DATA



Data Streaming – Adapts to Changing Bandwidth, Maintain High Resolution & Low Latency



**“Would you ever put your personnel or citizens in harms way unnecessarily?”**

**“If you aren’t using drone capabilities, you are doing just that?”**





**DRONERESPONDERS**

*droneresponders.org*

*Please register on the website, membership is FREE*





**DRONERESPONDERS**

**VIDEO**

[video.droneresponders.org](https://video.droneresponders.org)



# Contact Information

**Chief Charles L. Werner (Ret.)**  
**Director, DRONERESPONDERS**  
**[charles@droneresponders.org](mailto:charles@droneresponders.org)**

**Mobile: 434.825.5402**