

# *Air View Consulting*



## **Drone Aircraft Challenges to Port Security for American Association of Port Authorities Port Security Seminar July 22,2015**

## ***Air View Consulting***

### Our Services:

- We provide consulting services for the integration of UAS into businesses and government entities
- We develop a roadmap for our Clients to include
  - Identification of potential areas where UAS Technology could be beneficial and cost effective
  - Provide counsel on the decision of outsourcing the service or developing an in-house team to conduct UAS operations

## ***Air View Consulting***

### Our Services:

- Selection of the appropriate UAS for the mission
- Identify any potential conflicts with local or state statutes limiting the use of UAS
- Examine the National Air Space in the area where potential UAS flights will occur to identify any conflicts
- Facilitate the regulatory process of obtaining a COA or 333 Exemption
- Develop and participate in the RFP process for procurement of a UAS

*To discuss today...*

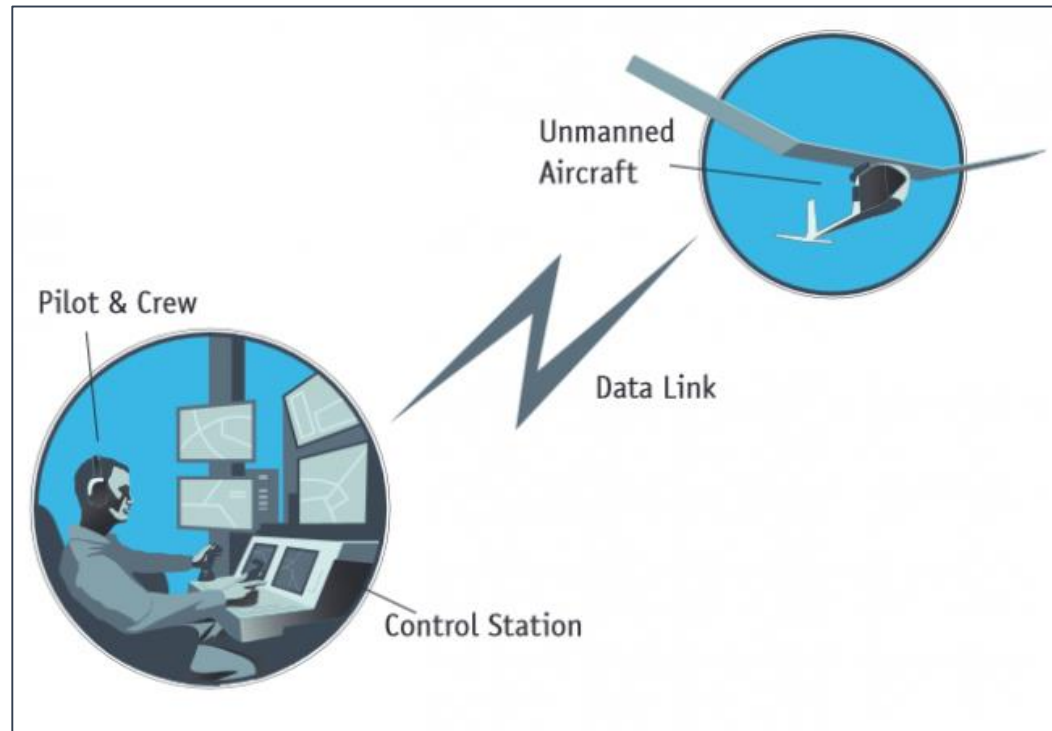
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***Points of Discussions will Include today.....***

- UAS Airframes Overview
- Payloads
- Security Operations
- Security Breach Challenges
- Operational Safety
- Latest FAA Actions
- Supporting Technology

According to the FAA:  
Collectively several components make up a  
Unmanned Aircraft System (UAS)

UAS =



## *What do all the Terms Mean?*

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Common “*References*” to UAS you’ll normally hear.....

**“Drone”**

Military Connotations

**“R/C”**

Hobbyist & Non Commercial

**“UAV”**

Becoming a Commercial Term

**“ROA”**

Old FAA Term (Remote Operated A/C)

**“Quad Copter”**

Somewhat of a “*Slang*”

**“UAS” or “UA”**

\*\*\* FAA .... Use This One

**“Small UAS”**

Weights 55 lbs. or less including payload

# Airframes

## *What are the Types of UAS Aircraft?*

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UAS are typically classified several ways:

- Flight Characteristics
- Takeoff & Landing Methods
- Source of Power
- Weight



# *What are the Types of UAS Aircraft?*

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## Flight Characteristics:



VTOL  
(Vertical Takeoff and Landing)



Rotor Wing  
(Helicopter)



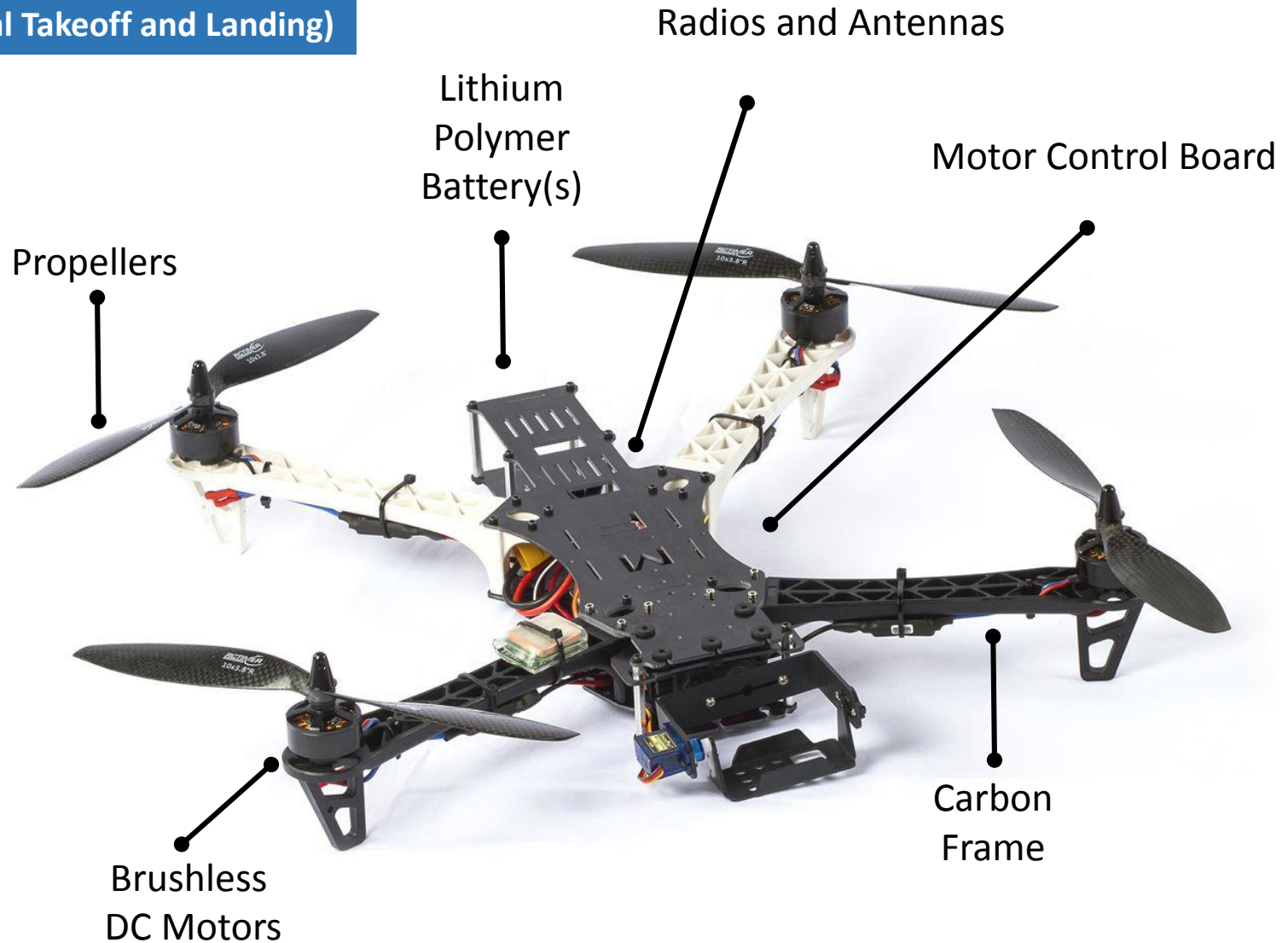
Fixed Wing  
(Airplane)

# *What are the Types of UAS Aircraft?*

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## VTOL

(Vertical Takeoff and Landing)



# What are the Types of UAS Aircraft?

## VTOL (Vertical Takeoff and Landing)

### VTOL Variations

#### Quad Copter



2 to 5 lb. Payloads  
45 to 60 Minutes

#### Hexa Copter

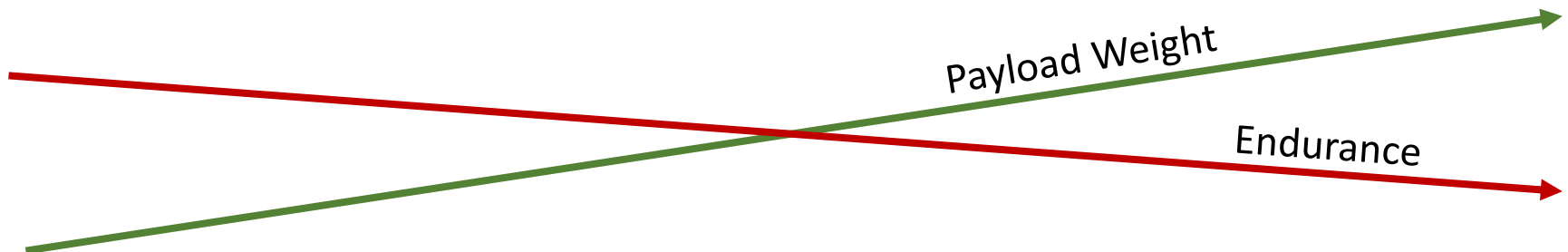


5 to 10 lb. Payloads  
30 to 45 Minutes

#### Octo Copter



10 to 15 lb. Payloads  
30 Minutes or Less



# *What are the Types of UAS Aircraft?*

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## **Rotorcraft (Helicopter)**

### **Rotorcraft Variations**

#### **Single Rotor & Tail Rotor**



#### **Counter Rotating Rotors**



# *What are the Types of UAS Aircraft?*

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## **Fixed Wing (Airplane)**

### **Fixed Wing Variations**

#### **Hand Launch**



#### **Catapult Launch**



# *What are the Types of UAS Aircraft?*

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## **Fixed Wing (Airplane)**

### **Fixed Wing Variations**

#### **Parachute Recovery**



#### **Landing & Stall Recovery**



# Payloads

## *What are the Types of UAS Payloads?*

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### UAV Payloads on the Market:

- Intelligence, Surveillance, Reconnaissance (ISR)
- Real Time Video
- Electro-optical/Infrared Camera (EO/IR)
- High Resolution 4K Cameras
- Multispectral Cameras
- LiDAR



# *What are the Types of UAS Payloads?*

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## Payload Configurations:



Payloads



## *What are the Types of UAS Payloads?*

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Before  
Hurricane



After  
Hurricane

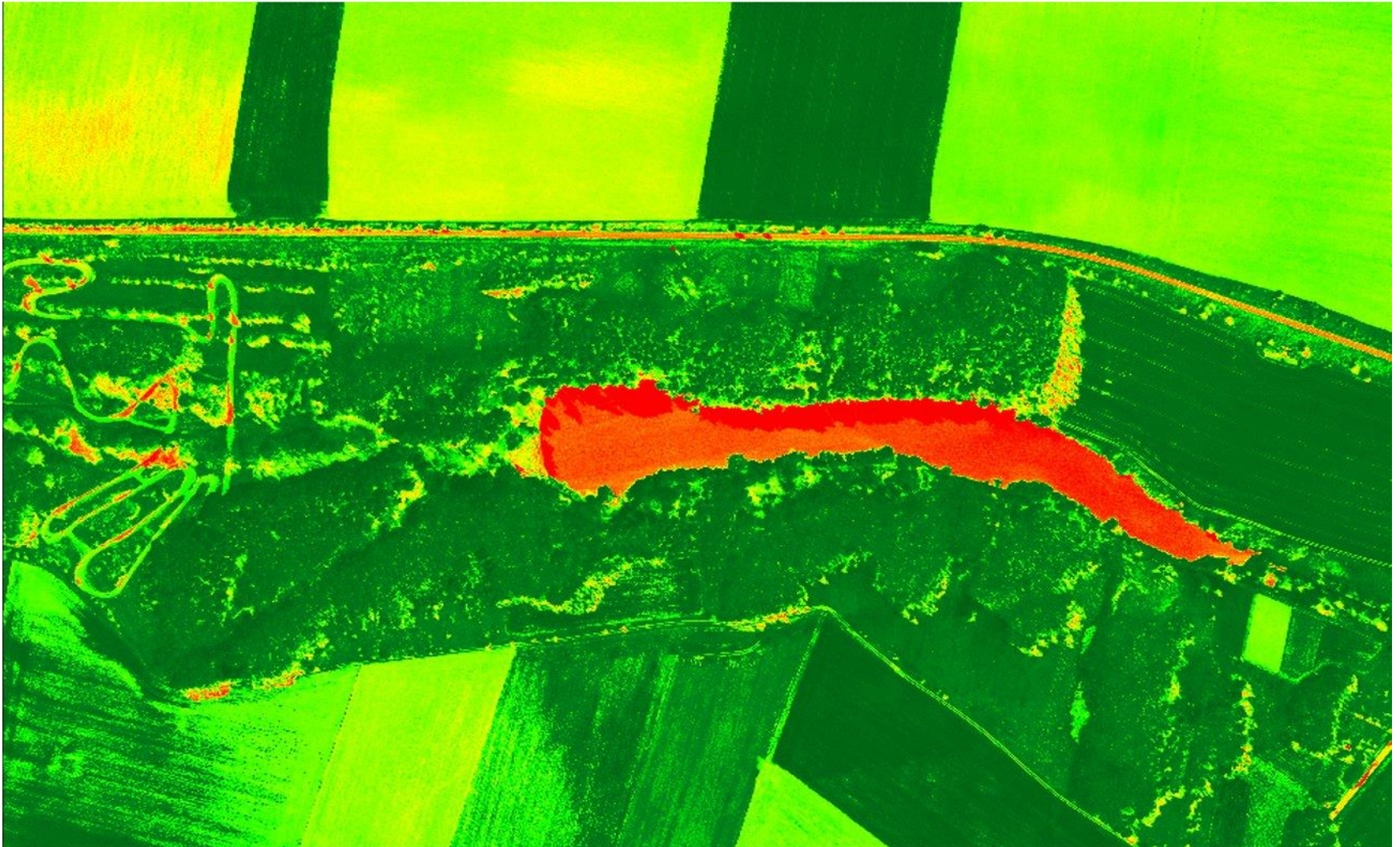




## *What are the Types of UAS Payloads?*

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NDVI (Normalized Difference Vegetation Index):  
RGB & Near I/R

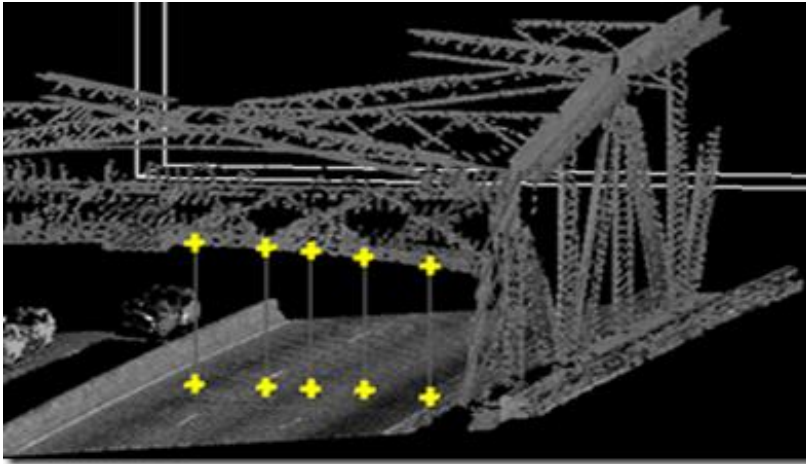




# *What are the Types of UAS Payloads?*

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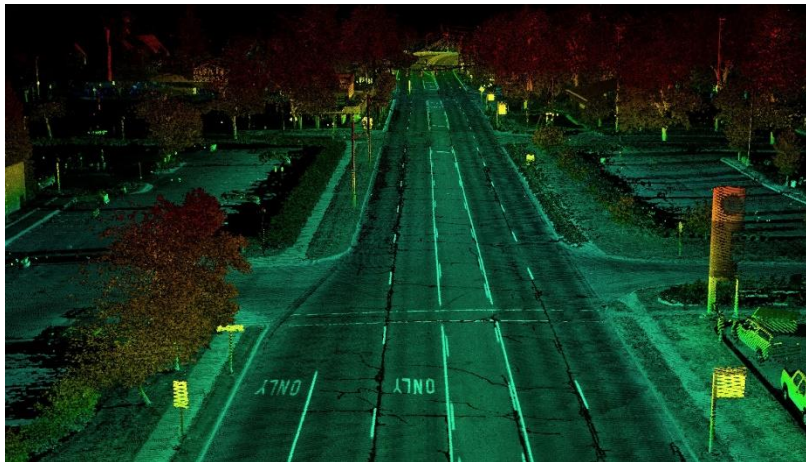
## LiDAR (3D Engineering Models):



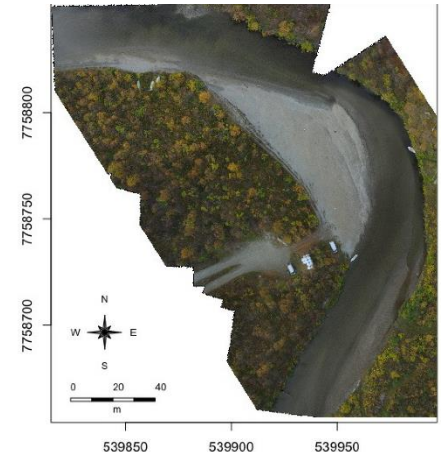
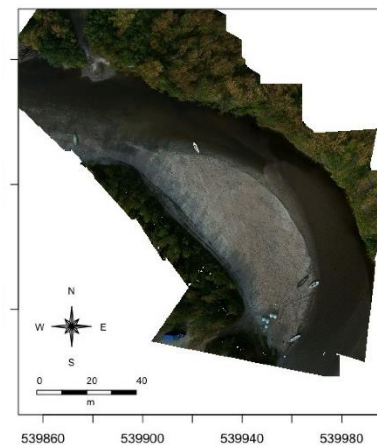
Bridges



Intersections



Street Construction



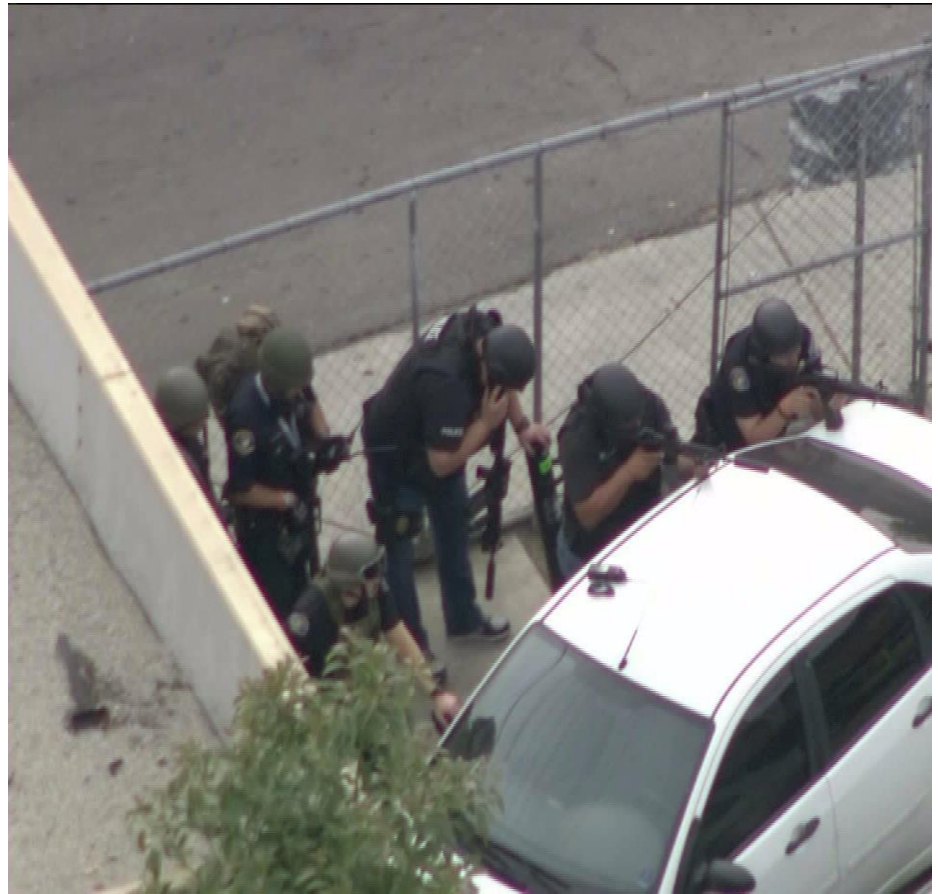
Waterways

# Flight Missions

## *What are the Types of Missions?*

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- Day to Day Port Security Operations
- Alarm/Breach Response
- Container Screening
- Rooftop Security
- Emergency Response
- Training
- Situational Awareness



## *What are the Types of Missions?*

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- Suspicious Persons
- Suspicious Vehicles
- Tactical Operations
- Fleeing Suspect
- Perimeter Security Checks
- Motor Vehicle/Vessel Accident Investigations
- Hazardous Material Response
- Crime Scene Investigation and Documentation

## *What are the Types of Missions?*

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- Fire Ground Command
- Search and Rescue
- Communications Enhancement
- Hazardous Materials Response





## *What are the Types of Missions?*

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- Sensor / Plume Observation
- Pre and Post Natural Disaster Documentation



## *What are the Types of Missions?*

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- Container Screening with Sensors
- Site Mapping
- Infrastructure Security
- Marketing Videos



# **How Can You Protect The Port From A UAV?**

## *Drone Security Challenges to Port Operations?*

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Several Systems Under Development and Testing

The Net Approach

GPS Geofencing – Jamming

Projectile – Shoot It Out Of The Sky

All Good, But All Have The Same Challenge .....

***LIABILITY OF WHERE IT FALLS AND WHAT IF IT IS CARRYING MUNITIONS  
OR A BIOLOGICAL WEAPON????***

Interim Approach

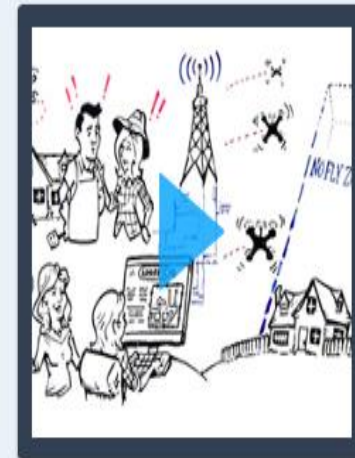
Seek out Operator

NoFlyZone.org

Enter your address below to create  
a No Fly Zone over your home. It's free!

ENTER A LOCATION

You will be prompted for your name and e-mail address after confirming your property address.



Enter your home address and provide basic info. Takes 30 seconds and free for life!



We verify your information and register your address and GPS coordinates in our NoFlyZone.org database.



We coordinate with participating drone manufacturers to automatically prevent drones from flying over your property.

# Becoming Approved to Fly

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## Three (3) Areas of “Discussions” around UAS’s Use:

- Safely & Efficiently coexisting in the National Airspace System (NAS) with existing aircraft.
- Protection from any harm to people and property.
- Privacy

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- **COA – Certificate of Authorization(Public)**
  - **333 Exemption (Commercial)**
  - **DOJ MOU – Public Safety**



# **Overview of Small UAS Notice of Proposed Rulemaking**

## **Summary of Major Provisions of Proposed Part 107**

The following provisions are being proposed in the FAA's Small UAS NPRM.

### **Operational Limitations**

- ☐ Unmanned aircraft must weigh less than 55 lbs. (25 kg).
- ☐ Visual line-of-sight (VLOS) only; the unmanned aircraft must remain within VLOS of the operator or visual observer.

- ☐ At all times the small unmanned aircraft must remain close enough to the operator for the operator to be capable of seeing the aircraft with vision unaided by any device other than corrective lenses.
- ☐ Small unmanned aircraft may not operate over any persons not directly involved in the operation.
- ☐ Daylight-only operations (official sunrise to official sunset, local time).
- ☐ Must yield right-of-way to other aircraft, manned or unmanned.
- ☐ May use visual observer (VO) but not required.
- ☐ First-person view camera cannot satisfy “see-and-avoid” requirement but can be used as long as requirement is satisfied in other ways.
- ☐ Maximum airspeed of 100 mph (87 knots).
- ☐ Maximum altitude of 500 feet above ground level.
- ☐ Minimum weather visibility of 3 miles from control station.
- ☐ No operations are allowed in Class A (18,000 feet & above) airspace.

- ☐ Operations in Class B, C, D and E airspace are allowed with the required ATC permission.
- ☐ Operations in Class G airspace are allowed without ATC permission
- ☐ No person may act as an operator or VO for more than one unmanned aircraft operation at one time.
- ☐ No careless or reckless operations.
- ☐ Requires preflight inspection by the operator.
- ☐ A person may not operate a small unmanned aircraft if he or she knows or has reason to know of any physical or mental condition that would interfere with the safe operation of a small UAS.
- ☐ Proposes a microUAS option that would allow operations in Class G airspace, over people not involved in the operation, provided the operator certifies he or she has the requisite aeronautical knowledge to perform the operation.

## **Operator Certification and Responsibilities**

❑ Pilots of a small UAS would be considered “operators”.

❑ Operators would be required to:

Pass an initial aeronautical knowledge test at an FAA-approved knowledge testing center.

- Be vetted by the Transportation Security Administration.
- Obtain an unmanned aircraft operator certificate with a small UAS rating (like existing pilot airman certificates, never expires).
- Pass a recurrent aeronautical knowledge test every 24 months.
- Be at least 17 years old.
- Make available to the FAA, upon request, the small UAS for inspection or testing, and any associated documents/records required to be kept under the proposed rule.
- Report an accident to the FAA within 10 days of any operation
- that results in injury or property damage.
- Conduct a preflight inspection, to include specific aircraft and control station systems checks, to ensure the small UAS is safe for operation.

## **Aircraft Requirements**

☐ FAA airworthiness certification not required. However, operator must maintain a small UAS in condition for safe operation and prior to flight must inspect the UAS to ensure that it is in a condition for safe operation. Aircraft Registration required (same requirements that apply to all other aircraft).

☐ Aircraft markings required (same requirements that apply to all other aircraft). If aircraft is too small to display markings in standard size, then the aircraft simply needs to display markings in the largest practicable manner.

## **Model Aircraft**

☐ Proposed rule would not apply to model aircraft that satisfy all of the criteria specified in Section 336 of Public Law 112-95.

☐ The proposed rule would codify the FAA's enforcement authority in part 101 by prohibiting model aircraft operators from endangering the safety of the NAS.

Under the new policy, the FAA will grant a Certificate of Waiver or Authorization (COA) for flights at or below 200 feet to any UAS operator with a Section 333 exemption for aircraft that weigh less than 55 pounds, operate during daytime Visual Flight Rules (VFR) conditions, operate within visual line of sight (VLOS) of the pilots, and stay certain distances away from airports or heliports:

- 5 nautical miles (NM) from an airport having an operational control tower; or
- 3 NM from an airport with a published instrument flight procedure, but not an operational tower; or
- 2 NM from an airport without a published instrument flight procedure or an operational tower; or
- 2 NM from a heliport with a published instrument flight procedure

The “blanket” 200-foot COA allows flights anywhere in the country except restricted airspace and other areas, such as major cities, where the FAA prohibits UAS operations.



# **Supporting Technology in the operation of Unmanned Aircraft Systems**

**Air Boss Information Management System**

**Simulator Training and Modeling**

**Underwater Remote Operating Vehicles**

**Live Video Anywhere**



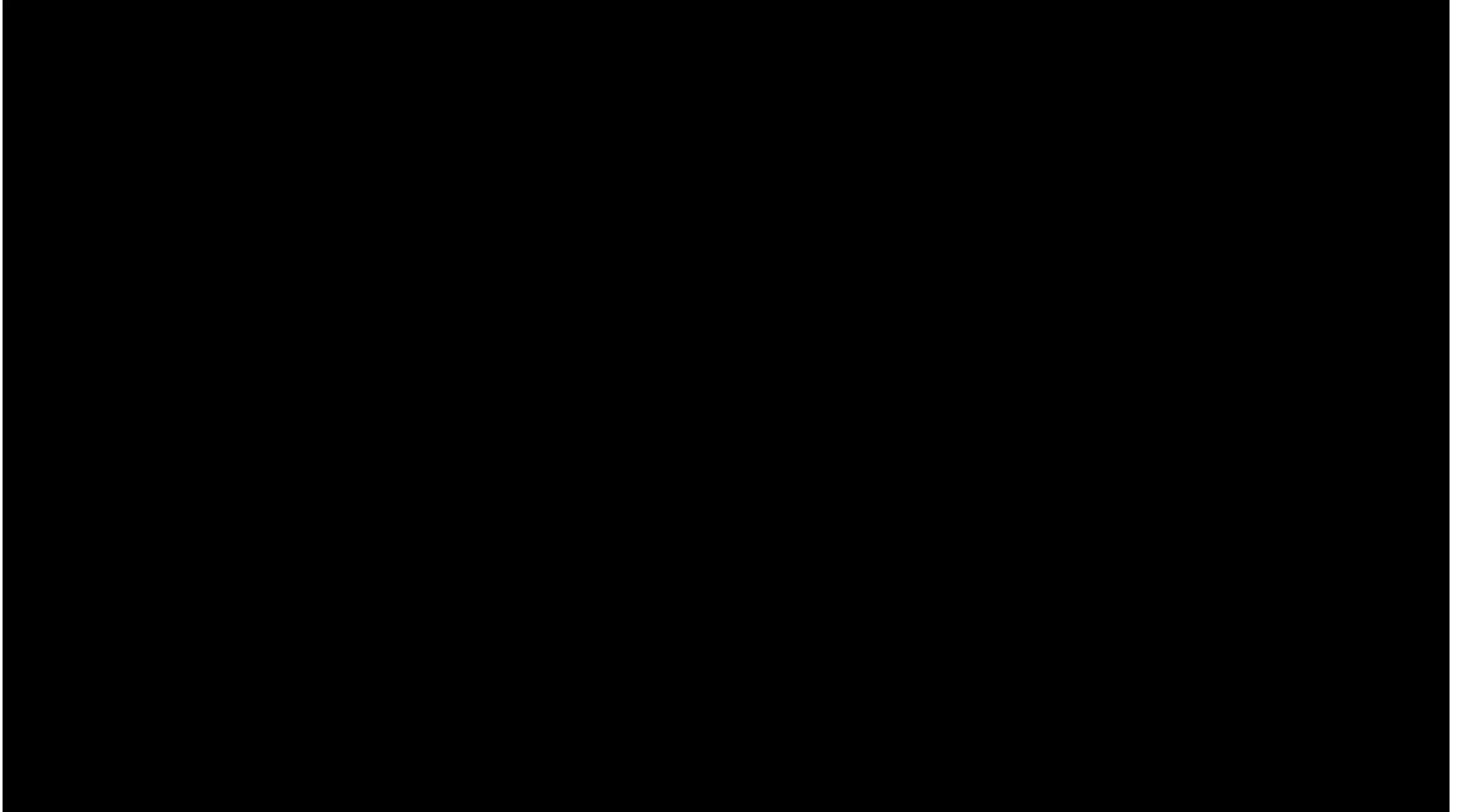
## **Managing End To End Aviation Basis**



## **3D Imaging and Video Simulation**

## *Example of 3D Site Mapping and Virtual Training (Simulator)*

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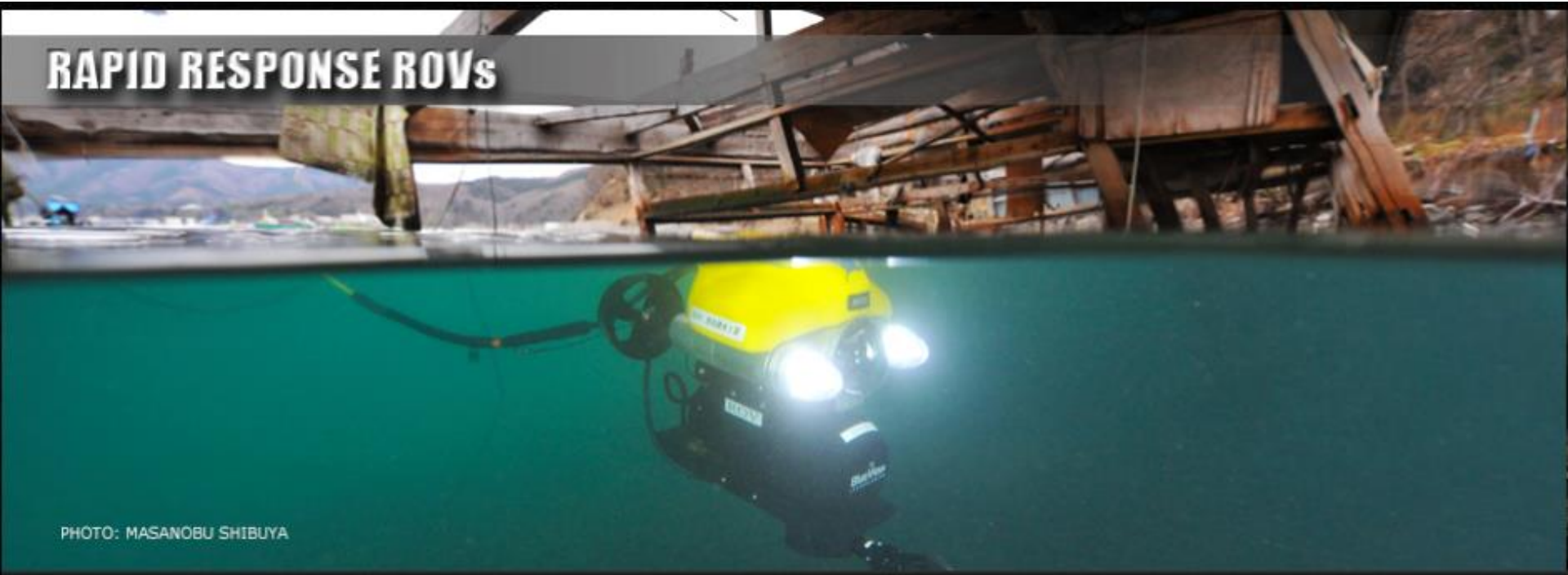


## Video Ray

### Underwater Remote Operated Vehicle

**RAPID RESPONSE ROVs**

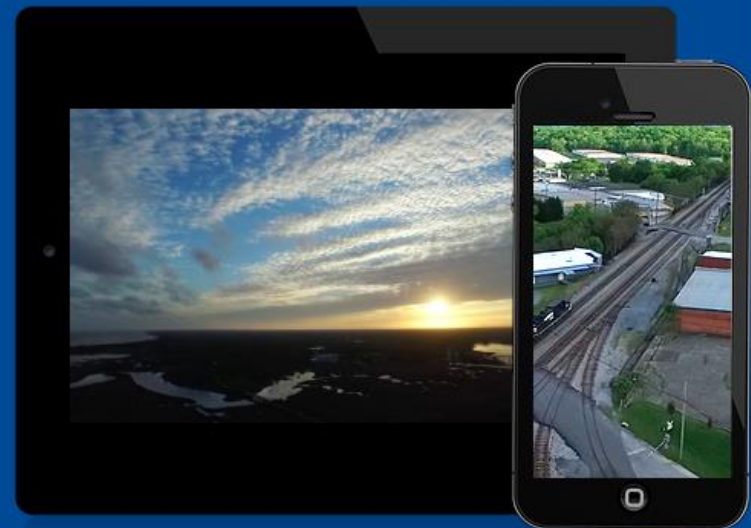
PHOTO: MASANOBU SHIBUYA





YOUR DATA,  
EVERYWHERE,  
ON ANY DEVICE.

Users can view your data on any device with an internet connection and Google Chrome or Firefox.



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Next Steps  
To  
Consider



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### ***A Few Things to think about.....***

- Who are all the stakeholders related to UAS needs, operations, and strategy?
- Does your organization have a UAS Road Map/Strategy that extends into the next 3 to 5 years?
- What is your organization's position, policy, and enforcement toward **Private Citizen** use of UAS inside your jurisdiction?
- How are you handling PR, News Releases, and Interviews when they arise related to UAS operations and policy?
- What would your due diligence and procurement process look like to secure UAS hardware, software, and services once you move forward?
- Are you prepared to implement a safety and operational based UAS Program?

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