

**-Board Report-  
Drone Pilot Program Update  
&  
2018 Commonwealth Counter-UAS Summit**

January 11, 2019

Dr. Jeff DeCarlo, MassDOT Aeronautics Administrator  
Commonwealth UAS Integration (CUIP) Program Lead

# Drone Pilot Program (DPP)



- Facilitate the utilization of drones across MassDOT and the MBTA in support of agency missions and in a manner that is safe, cost-effective, and secure
  - Transportation applications include construction site imagery, asset management, inspections, and incident response
- Build a strong policy-driven foundation, and execute an operationally focused effort to build practical capabilities, gain field experience, address challenges, while also using experiential learning to improve and solidify the policy foundation

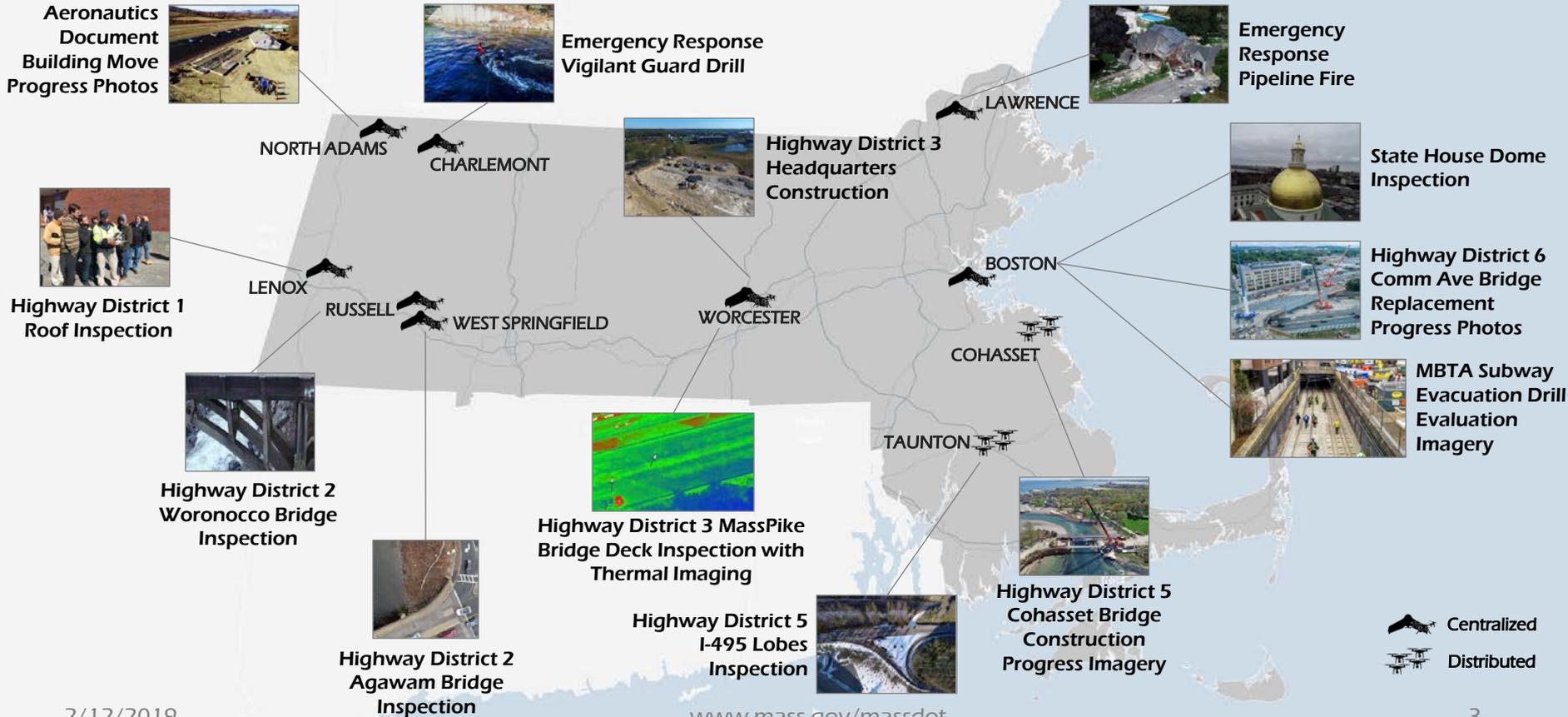
 Safety

 Task Times

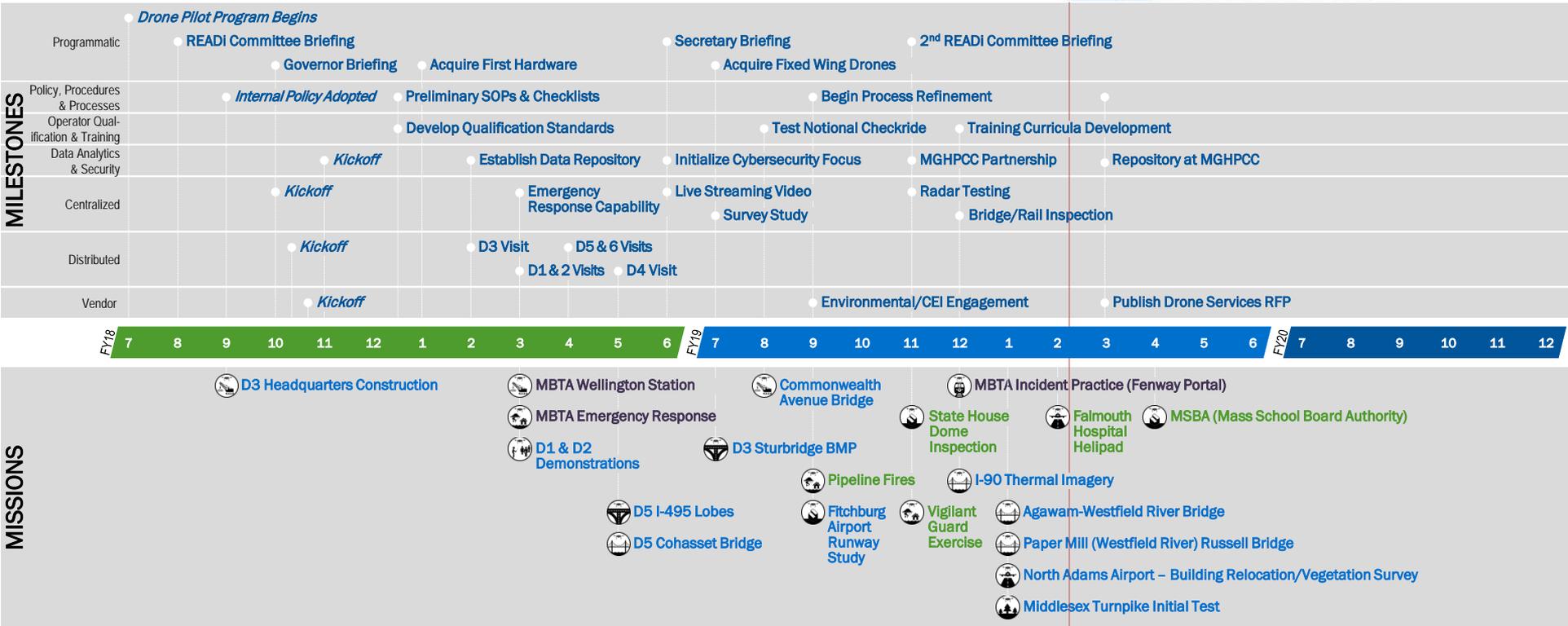
 Quality of Data

 Cost

# Drone Support Across MassDOT & MBTA



# Drone Pilot Program Timeline



TODAY

**Mission Types**

**Organization**

Rail Inspection	Bridge Inspection	Building Inspection	Environmental	Incident Response
Highway Inspection	Airport Inspection	Construction Site Monitoring	Demonstration	

MassDOT
MBTA
Other

# Commonwealth UAS Integration Program (CUIP)



- Create a world-class ecosystem within the Commonwealth to:
  - Support technical, commercial, and economic development in unmanned and autonomous air vehicle systems
  - Create a safe, secure, and adaptable framework(s) for integrating unmanned and autonomous air vehicle systems in MA, and beyond
  - Support the development of solutions to address misuse of UAS technologies

# 2018 Commonwealth Counter-UAS Summit

# Objectives

- Convene Commonwealth agencies with stakeholders from government, industry, and academia
- Share the most current information on Counter-UAS risks, needs and solutions
- Consider the coordination and leveraging of best practices, efforts, and resources
- Discuss the optimum way forward
- Network with stakeholders

# Recent Disruptions

## Drones close London airport



Tens of thousands of Christmas-season travelers were grounded at London's busy Gatwick Airport Thursday. Drones, operated by unknown people, repeatedly buzzed the runway, prompting authorities to delay takeoffs for safety reasons.

**Katz, G., Associated Press**

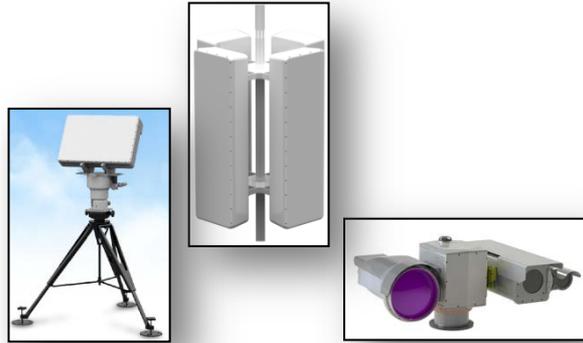
- Venezuela, Maduro, Aug 4, 2018
- Gatwick Dec 19-21, 2018
  - The Costs
- Heathrow – Jan 8, 2019
- Newark – Jan 22, 2019
- Others

# Technologies to Address CUAS Challenges<sup>1</sup>

## Probably Legal (Passive)

### ■ Detectors:

- Radar
- Radio wave receivers
- Audio sensors to “hear”
- Optical sensors to see



## Currently Prohibited<sup>2</sup>

### ■ Defenders:

- Jammers
- Spoofers (for GPS signals)
- Hackers
- Sonic



## Currently Prohibited<sup>2</sup>

### ■ Destroyers:

- Lasers
- Electromagnetic Pulse
- High Energy Microwave
- Guns

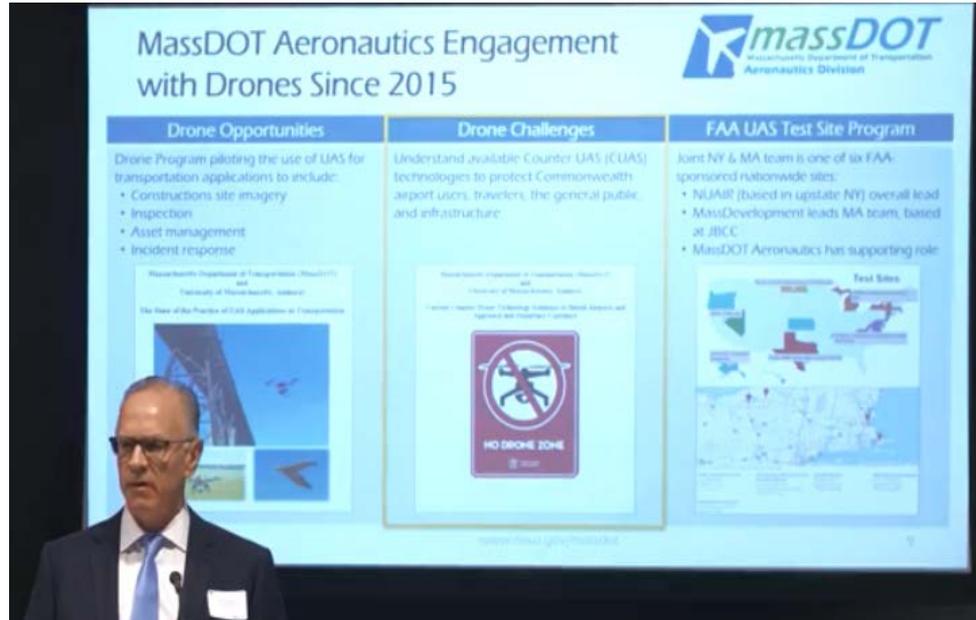
### ■ Snaggers (Nets)



Note 1: <https://jrupprechtlaw.com/drone-jammer-gun-defender-legal-problems>

Note 2: Some federal agencies may be permitted under certain circumstances

# MassDOT Aeronautics Counter-UAS Roles



**MassDOT Aeronautics Engagement with Drones Since 2015**

Drone Opportunities	Drone Challenges	FAA UAS Test Site Program
<p>Drone Program piloting the use of UAS for transportation applications to include:</p> <ul style="list-style-type: none"><li>• Construction site imagery</li><li>• Inspection</li><li>• Asset management</li><li>• Incident response</li></ul>	<p>Understand available Counter UAS (CUAS) technologies to protect Commonwealth airport users, travelers, the general public, and infrastructure.</p>	<p>Joint NY &amp; MA team is one of six FAA-sponsored nationwide sites:</p> <ul style="list-style-type: none"><li>• NJAAR (based in upstate NY) overall lead</li><li>• MassDevelopment leads MA team, based at JBCC</li><li>• MassDOT Aeronautics has supporting role</li></ul>

**Administrator Jeff DeCarlo**

- Protect critical transportation infrastructure
- Practical lead – Sharing best practices with all state agencies
- Statutory authority to ensure safety of the state aviation system
- Legal Lead – MassDOT Aeronautics Counsel

# Summary

- Convene Commonwealth agencies with stakeholders from government, industry, and academia
- Share the most current information on Counter-UAS risks, needs and solutions
- Consider the coordination and leveraging of best practices, efforts, and resources
- Discuss the optimum way forward
- Network with stakeholders

Thank you!

# Counter-UAS (CUAS) Summit

## Nov 9, 2018



Introduction.....	EOPSS-Homeland Security
Objectives & Coordination.....	MassDOT Aeronautics
Challenges.....	Massachusetts State Police (MSP)
CUAS Continuum.....	DHS National Urban Security & Technology Lab
Countering Malicious Drones.....	Federal Bureau of Investigation (FBI)
Industry Perspective.....	Raytheon
Case Study.....	MSP
Solutions.....	Industry & Academia Presentations

# Counter-UAS: The Challenge



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# Attendees at this Summit: 79 Leaders from 45 Orgs



## # Org Agencies & Organizations

Gov't-Fed	8	DHS, FAA, FBI, JBCC, MITRE, USAF, USCG, Volpe
Gov't-State	22	State Agencies & Quasi's
Gov't-Local	2	Boston, Foxborough
Industry	11	Large & Small
Academia	2	UMass, MIT Lincoln Labs

# Intro – EOPSS Homeland Security



**Undersecretary Patrick McMurray (EOPSS-HLS)**

# MSP: CUAS Challenges



Sgt. Mike George presented:

- The Clueless, the Careless, & the Criminal
- Enforcement
  - Chief Aeronautics Counsel to coordinate with FAA & MSP to provide effective legal tools

# CUAS: An Industry Perspective

## ■ Systems Integration – Dr. Waseem Naqvi



### Counter UAS Mission Sets

Differing mission sets have different attributes:

Military Infrastructure	Critical Infrastructure	Civilian Buildings
<ul style="list-style-type: none"><li>• Remote forward operated controlled areas</li><li>• Sparsely populated</li><li>• Kinetic effects are acceptable</li></ul>	<ul style="list-style-type: none"><li>• Oil fields, dams, power production sites, etc.</li><li>• Sparsely populated, controlled areas</li><li>• Kinetic effectors may be acceptable, but non-kinetic effectors may be desired</li></ul>	<ul style="list-style-type: none"><li>• Key government facilities, Palaces, and smaller controlled areas</li><li>• Densely populated</li><li>• Non-kinetic effectors are desired</li></ul>

Different Missions Require Tailored Solutions

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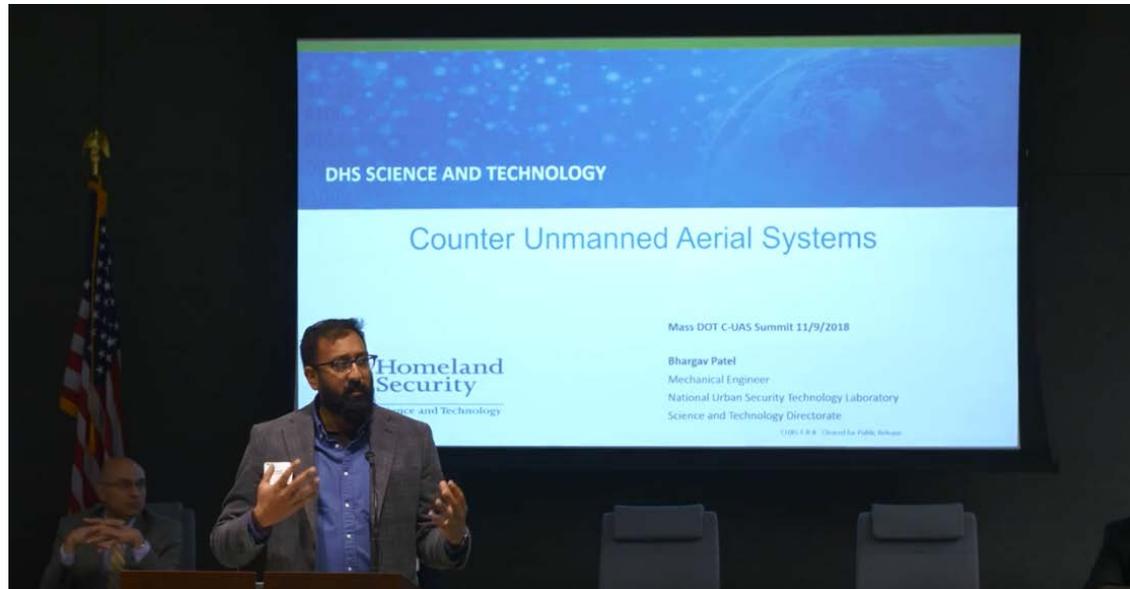
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# NUSTL – National Urban Security Technology Laboratory (DHS S&T)



Homeland Security

## CUAS Continuum – Bhargav Patel



# FBI: UAV, UAS & Drones



- Current Threat Trends and CUAS Near Future –  
Special Agent Joshua Canter
  - Hacking
  - Jamming
  - Title 18 – FAA Reauthorization Act of 2018 (10/2018)
    - Provided some relief
    - Awaiting further guidance from AG on future CUAS mission capabilities
    - Continued R&D into more advanced detection and mitigation solutions