THE BUSINESS OF DRONES
PRESENTATION TO BIG CITY EMERGENCY MANAGERS
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SEATTLE, WA

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INTRODUCTIONS

UAV Background/Purpose of project

Legal challenges of Government use of UAVs (aka “drones”)

Survey results

Advice for starting a program
**UAV BACKGROUND**

- **Unmanned Aerial Vehicles (UAV)**
- **UAVs date as far back as the Vietnam War**
- **Classes of UAVs**

- **Micro UAV**
  - Toy Drone
  - ~.25 lbs.

- **Small UAV**
  - DJI Phantom IV
  - ~3 lbs.

- **Small UAV**
  - Aeryon SkyRanger
  - ~5-55 lbs.

- **Military Use**
  - Predator UAV
  - ~2,250 lbs.

- **Military Use**
  - Global Hawk UAV
  - ~32,250 lbs.
UAV BACKGROUND

- Small UAV Types
  - Rotary Wing (Hover capability)
  - Fixed Wing (Range)
  - Tethered
- UAV Current Technology
  - HD Camera
  - Infrared
  - Multispectral
  - Lidar
 WHETHER YOUR REACTION TO UAVS ARE ...
BOTTOM LINE

• FOR YUCKS AND MEHS

  • UAVS HAVE SPECIFIC BENEFITS IN KEY AREAS OF SITUATION ASSESSMENT, DMG ASSESSMENT, HAZARD MONITORING, USAR, INSPECTIONS AND SUPPLY DELIVERY THAT CAN INCREASE PRODUCTIVITY, REDUCE SAFETY RISKS, AND EXPAND AREAS YOU CAN REACH QUICKLY.

• FOR KIDS IN CANDYSTORE

  • NEED TO REALIZE THIS ISN’T A SILVER BULLET. OPERATIONS WILL BE TEMPERED BY LIMITS ON TECHNOLOGY, LOCAL POLITICS, REGULATIONS, AND ORGANIZATIONAL CAPACITY

• PURPOSE

  • PROVIDE GUIDANCE TO EMERGENCY MANAGERS SEEKING TO USE UAVS IN THEIR PROGRAMS BY SUMMARIZING CURRENT LEGAL, REGULATORY AND SOCIAL ENVIRONMENT AND BY IDENTIFYING APPROACHES USED BY PEER EMERGENCY MANAGEMENT PROGRAMS.
CHALLENGES FOR GOVERNMENT UAV USE

1. Fourth Amendment
   • Search and Seizure
   • Privacy
   • United States v. Causby, 1946
   • California v. Ciraolo, 1986
CHALLENGES FOR GOVERNMENT UAV USE

2. U.S. AIRSPACE

- **Federal Aviation Administration Modernization and Reform Act of 2012. Title 14 of the Code of Federal Regulations, part 107,**
- **August 29, 2016. The Federal Aviation Administration (FAA) released new rules for small unmanned aircraft systems**
CHALLENGES FOR GOVERNMENT UAV USE

3. State and Local Laws
   • Laguna Beach, CA
   • Chicago, IL

4. Drone Federalism Act of 2017
Respondents were slightly less knowledgeable about employment of UAVs specifically in support of emergency management.
IMPLEMENTATION

Existing UAV programs

Common UAV application

- Inspection
- Situation awareness
- Damage assessment
- Surveillance
- Mapping
- Search and rescue
- Other (please specify)
There are more jurisdictions with established drone policies than programs; roles are spread amongst departments/agencies.

UAV programs are generally staffed by FTEs.
A major challenge to UAV employment are public privacy concerns.
ADVICE FOR ESTABLISHING EM UAV PROGRAM

THE EXTENDED ELEVATOR SPEECH
PRACTICAL IDEAS FOR CITIES

• Build off of existing programs (fire, marine safety, utilities, etc)

• Recognize that you’ll have to adapt to BCEM environment
  • Big City
  • Emergency Management

• Slow and transparent (tortoise)

• Decide on a program model

• Form partnerships with trusted agents

• Analyze your capabilities (staffing, budget, etc…)

• What platforms and payloads will you need (mission driven)
PROGRAM MODELS

• Direct ownership (EM agency owns UAV and flies with own staff)
• City ownership (Operational dept owns)
• Contracted (Traditional or ‘Gig’ – e.g., Drone Up)
• Volunteer
• Mutual aid
• DCSA
• Private entities
• Regardless: they are coming and you need an airspace plan
PROGRAM ELEMENTS

• How many blue sky missions will you fly? 24/7 What kind of missions?
  • Drives staffing --> 3-4 trained staff per UAV
  • Centralized / Decentralized

• How will your program ‘get big fast’?
  • (Typical fire programs have limited number of UAV)

• Rules and Regulations
  • Get a COA
  • Have all pilots get 107 certified
  • How to deal with VLOS restriction in post-disaster environment
  • Understand TFR and airspace management (hasn’t been part of CEMPs)
SAFETY AND TRUST

• How will you plan to gain and keep public trust?
  • General UAV rules of the road – Orange County and Laguna Beach
  • Oversight – City of Seattle
  • Public participation and input – City of Austin
• Adapt to evolving legal, regulatory and technological environments
  • New case law
  • New laws
  • New capabilities
PRACTICAL CONSIDERATIONS – CRASAR.ORG

• Does payload match mission needs? Video only, Bad Weather, obstructions
• Fixed wing vs rotorcraft. Over people / water fixed wing safer. Inspections rotorcraft better
• Tether if you need long flight time
• Data processing needed? Will you create a geotagged point cloud?
• Need chain of custody for data along with metadata
• Having permission to fly over something is not the same as having permission to photograph it
• UAS can have crew of up to 9 people
THANK THE PIONEERS

• Charles Werner – http://publicsafetyuas.org
• David Merrick – Florida State University
• Center for Robot-assisted Search and Rescue – http://crasar.org
• City of Austin – Red Team, Richard Davis
• City of Spokane – Todd Powell
• City of Laguna Beach – Jordan Villwock
• City of Tallahassee – Richard Jones
• Tom Walker - DroneUp
IN SUM

- Genie is out of the bottle
- Need to get ahead of the issue
- Plan for how these tools will be used in a responsible manner
- We have good examples already for how to set up programs
- We need to figure out how to build BCEM style programs.