SMALL UNMANNED AIRCRAFT SYSTEMS
(PRACTICAL APPLICATIONS FOR LOCAL GOVERNMENTS)

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Introduction

Technological Advancements and Future Growth Projections

Benefits of Implementing sUAS Technology to Increase Efficiency and Safety
  ▶ Public Safety
  ▶ Emergency Management
  ▶ Infrastructure Inspections
  ▶ Mapping

Challenges to Implementing a Program
  ▶ Legislative Concerns
  ▶ Advocacy Group Concerns
  ▶ Community Engagement and Support

Safety and Risk Management (Considerations for sUAS Program Implementation)
  ▶ Regulatory Requirements and Limitations Focused on The Safe Integration of sUAS Into The National Airspace System
  ▶ Policy Adaptation to Ensure Transparency and to Limit Government Use
  ▶ Training and Standardization

AGENDA
Since the Part 107 rule became effective August 2016, more than 80,000 individual UAS have been registered for commercial and government purposes.

More than 100,000 people have obtained a Remote Pilot Certificate required to operate a sUAS commercially under Part 107.

The FAA is using a risk-based approach to enable increasingly more complex UAS operations.

There is a high possibility of growth to as many as 1.6 million commercial sUAS in use by 2021.

The FAA estimates the fleet of hobbyist sUAS will more than triple from an estimated 1.1 million vehicles in 2016 to more than 3.5 million by 2021.

Pilots of these sUAS vehicles are expected to increase from 20,000 at the end of 2016 to a range of 10 to 20 times as many by 2021.
The realization of the benefits associated with the technological advancements in the business of SUAS has been a game changer.

The evolution of SUAS integration into the national airspace system have been cautiously advancing.

Future growth is unlimited, and while industry has taken the lead, state and local governments have been slow to realize the benefits.
The Benefits of Integrating sUAS In Public Safety Operations

- Enhanced search and rescue operations
- Rapid crime scene mapping
- Timely accident scene mapping and reconstruction
- Officer safety through better situational awareness
- Critical incident response

The Benefits of Integrating sUAS In Public Safety Operations

- Fire management
- Firefighter safety through better situational awareness

SMALL UNMANNED AIRCRAFT SYSTEMS (SUAS)
PRACTICAL APPLICATIONS FOR LOCAL GOVERNMENTS
SMALL UNMANNED AIRCRAFT SYSTEMS (SUAS) PRACTICAL APPLICATIONS FOR LOCAL GOVERNMENTS

- Providing a Different Perspective to the Emergency Manager
  - Aerial perspective during critical incidences.
  - Prevents individuals from entering potentially hazardous areas.
  - Yes: Sniffer UAVs are here.
sUAS - Providing a Different Perspective to The Emergency Manager

- Critically helpful in large-scale disaster zones
- Eliminates the high costs of manned aviation
- Access hard-to-reach areas to perform data gathering tasks that are unsafe or impossible for humans
- Recent examples post the Houston and Florida hurricanes

SMALL UNMANNED AIRCRAFT SYSTEMS (SUAS)
PRACTICAL APPLICATIONS FOR LOCAL GOVERNMENTS

Michigan Utility using UAS for Infrastructure Inspections

Consumers Energy is the first utility in Michigan and the fourth in the U.S. to receive approval from the Federal Aviation Administration (FAA) to use unmanned aerial systems (UAS) to inspect wind turbines, power poles, transformers and other equipment.
Reducing The Risk to Humans

Revolutionary Unmanned Aircraft System/drone technology allows all types of precision sensors, from visual and infrared cameras to LiDAR distance-measuring tools, to be placed in optimum data gathering locations quickly, at low risk and low cost.

SMALL UNMANNED AIRCRAFT SYSTEMS (SUAS) PRACTICAL APPLICATIONS FOR LOCAL GOVERNMENTS

Challenges To Implementation

- Police manned aerial surveillance platforms have not generated the same level of privacy concerns as UAS
- Heightened Concerns
  - Over the perceived militarization of police agencies
  - Privacy and 4th Amendment Concerns

UAS IMAGERY USED FOR SITUATIONAL AWARENESS IS THE SAME DATA PROVIDED BY OTHER COLLECTION SYSTEMS
News helicopters
Police in-car video
Police body-cam video

IT’s ABOUT INFORMATION AND WHAT YOU DO WITH IT NOT WHERE YOU GET IT FROM. IT’s NOT ABOUT UAS/DRONES.
TUKWILA PD UAS COMMUNICATIONS PLAN

- Public Safety Committee
- Transportation Committee
- Community Oriented Police Citizens Advisory Board
- Tukwila International Boulevard Action Committee
- Tukwila Reporter Newspaper
- Hazelnut Publication
- City of Tukwila Website linked to Police Department Website

SMALL UNMANNED AIRCRAFT SYSTEMS (sUAS) PRACTICAL APPLICATIONS FOR LOCAL GOVERNMENTS

Tukwila Police Department sUAS Implementation Timeline

- JAN 17: Policy Development
- FEB 17: Remote Pilot Certification Training
- MAR 17: Communications Campaign Strategy Execution
- APRIL 17: UAS Flight Training and SOP Completion
- MAY 17: UAS Pilot Program Begins
- JUNE 17: Monthly Analysis of UAS Program
- JUL 17: Public Safety Committee Update on the UAS Program
- AUG 17: Monthly Analysis of UAS Program
- SEP 17: Monthly Analysis of UAS Program
- OCT 17: Monthly Analysis of UAS Program
- NOV 17: Final Monthly Analysis and Audit of UAS Program
- DEC 17: Final Public Safety Committee Update Full Implementation Determination
The Safety Risk Management Process
- Established Rules (FAA Part 107)
- Management Policies
- Procedures and best practices
- Identifying, analyzing, evaluating, mitigating risk
- Communicating and consulting (training and standardization)

COMPONENTS OF UAS SAFETY RISK MANAGEMENT

- Established Rules: FAA Part 107
  - VLOS
  - No flight over persons
  - Daylight Operations
  - Must yield right of way
  - Max ground speed 100 MPH
  - Max altitude 400 feet AGL
  - Min visibility 3 miles
  - ATC permission to operate in class B, C, D and E surface airspace

- Operations in class G airspace without ATC permission
- No careless or reckless operation
- No carriage of hazardous material
- Requires preflight inspection by the remote pilot in command
- No carriage of property beyond VLOS (cannot be waived)
The agency must obtain applicable authorizations, permits, or certificates required by the Federal Aviation Administration (FAA) prior to deploying or operating the sUAS, and these authorizations, permits, and certificates shall be maintained and current.

The sUAS will be operated only by personnel (pilots and crew members) who have been trained and certified in the operation of the system.

The sUAS-certified personnel shall inspect and test sUAS equipment prior to each deployment to verify the proper functioning of all equipment and the airworthiness of the device.

The sUAS equipment and all data, images, video, and metadata captured, recorded, or otherwise produced by the equipment is the sole property of the agency.

The sUAS POLICE UAS OPERATIONAL RISK ASSESSMENT WORKSHEET

<table>
<thead>
<tr>
<th>Crew Members</th>
<th>PIC: DeVries</th>
<th>AO: Dunlap</th>
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<td>Hazmat/EOD</td>
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<td>Actual</td>
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<td>&lt; 1000</td>
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<td></td>
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<td>10-20 kts</td>
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<tr>
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Scores of 16-20 (Low Risk): 21-44 (Medium Risk): 45-75 (High Risk): 76-95 (Extreme High Risk)

Recheck WX prior to flight and adjust as necessary.

MITIGATION NOTES:

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COMPONENTS OF UAS SAFETY RISK MANAGEMENT

Tukwila Police UAS Policy & Procedures For sUAS Use

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COMPONENTS OF UAS SAFETY RISK MANAGEMENT
Communicating - Training and Standardization
- Safety culture
- The use of checklist for all operations
- Standard operating procedures
  - Safety training
  - Reporting
  - Crew Resource Management
  - Human Factors (Fatigue and use of medications)
- Documentation and recordkeeping
- Data management software
- Maintenance programming

COMPONENTS OF UAS SAFETY RISK MANAGEMENT

QUESTIONS