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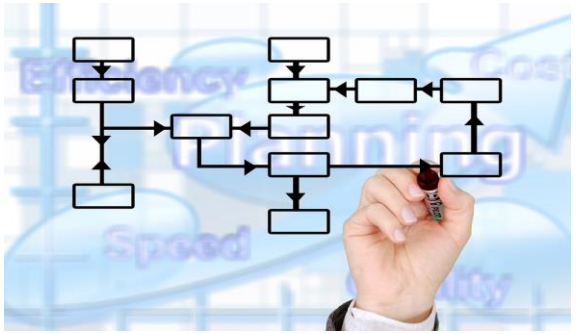
Concept of Operations for Emerging Technologies

October 4, 2021

Introducing Cavan Solutions

- Woman Owned Small Business
- Founded November 2016
- Based in Washington, D.C.
- Leadership with 25+ years aviation engineering, ATM operations, and consulting experience
- Focused on Government-side support of NAS evolution



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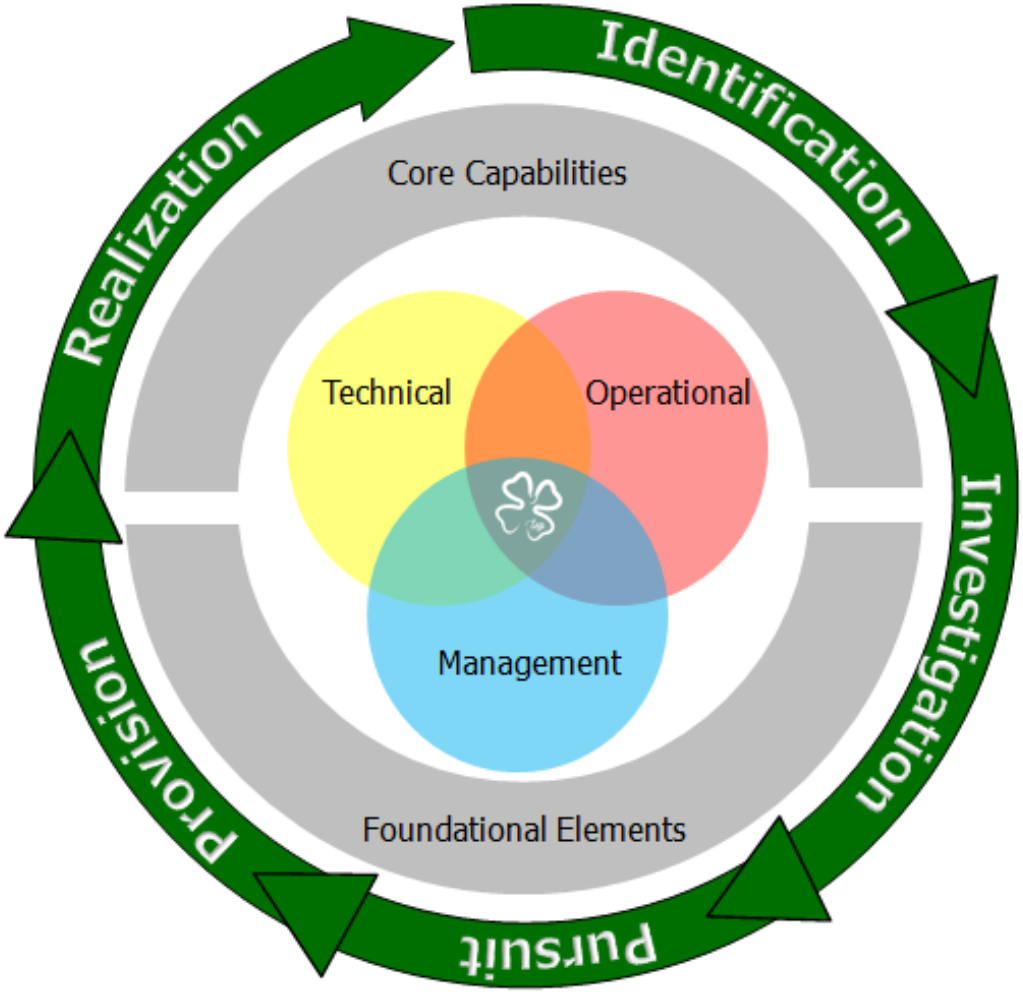
Cavan TOM Strategy (TOMS™)



UAS, UTM, & UAM Experience

- Developed UAM ConOps v1.0
- Supported UAS R&D: NASA UTM, Focus Area Pathfinder Program, and UAS Detection Initiative
- Developed NAS Voice System (NVS) UAS requirements
- Developed OSED and ConOps for sUAS Cargo operations in Mode C Veil
- Developing Clearance and Authorizations for low altitude UAS
- Identified NAS Automation gaps for integrated UAS operations (including ConOps for specific capability areas)
- FAA UAS Program Manager responsible for UAS integration into PMO/ATO
  - Supported Part 107 implementation activities
  - Developed solutions to support Part 107/Section 336 Low Altitude Authorization and Notification Capability
  - Conducted studies, analysis, and oversaw research to develop options for UAS C2 communication in the NAS
- DoD Squadron Commander for California-based worldwide UAS operation
- Designed and operated USAF 24/7/365 UAS operations center

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ConOps Development Process

- Consider prior research
- Potentially begin with an Operational Services Environment Description (OSED)
- Integrate technical and operational considerations throughout development process
- Utilize use cases and operational scenarios as appropriate
- Utilize cross functional SMEs to provide broad expertise

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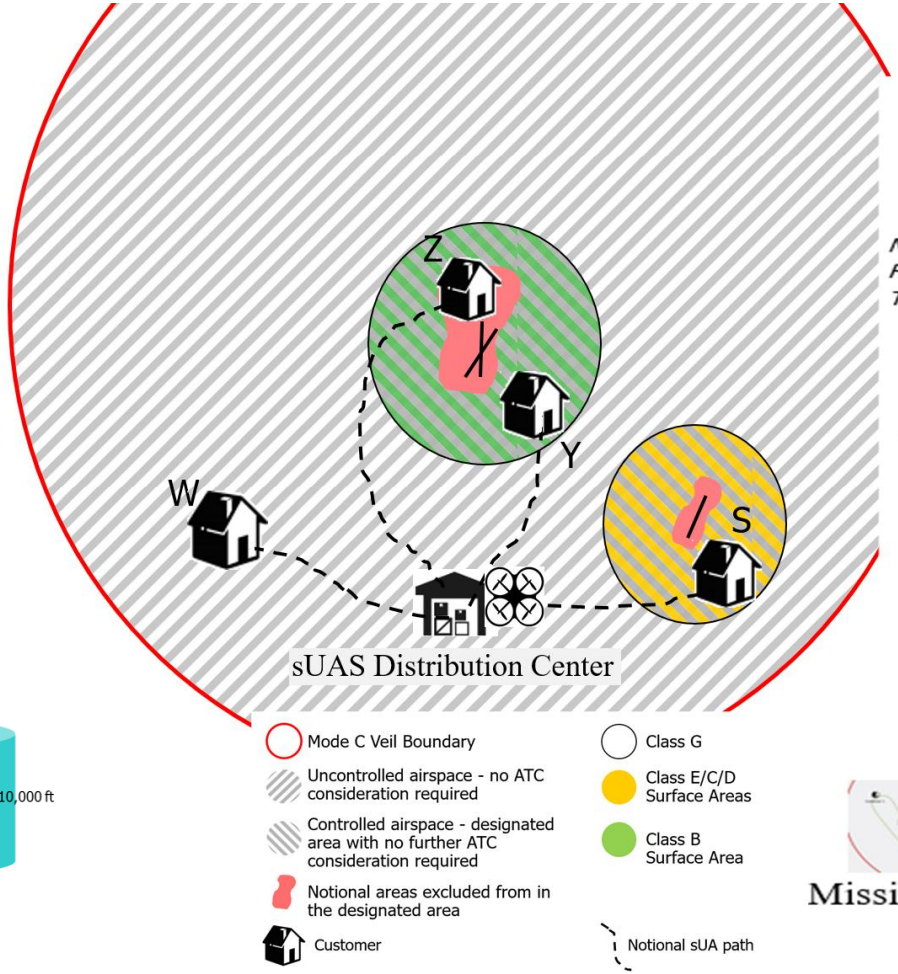
FAA ConOps – Typical Content

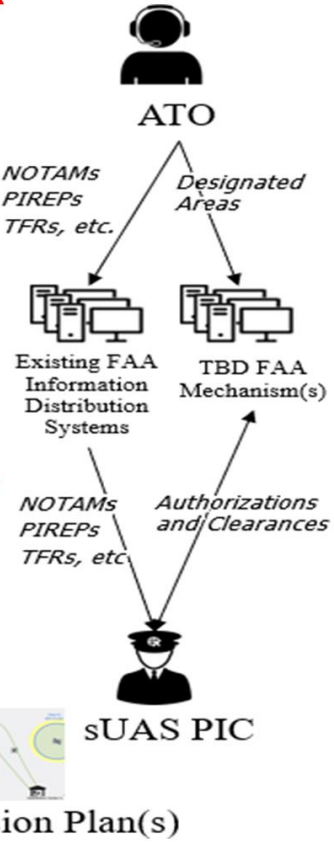
1. Introduction/Scope
   a. Background
   b. Problem Statement
   c. Identification
   d. Concept Overview
2. Current Operations and Capabilities
   a. Description of Current Operation
   b. Current Supporting Infrastructure
3. Justification and Description of Changes
4. Concept of Operations
   a. Assumptions and Constraints
   b. Operational Environment
   c. Operations
   d. Benefits to be Realized
5. Operational Scenarios
6. Summary of Impacts

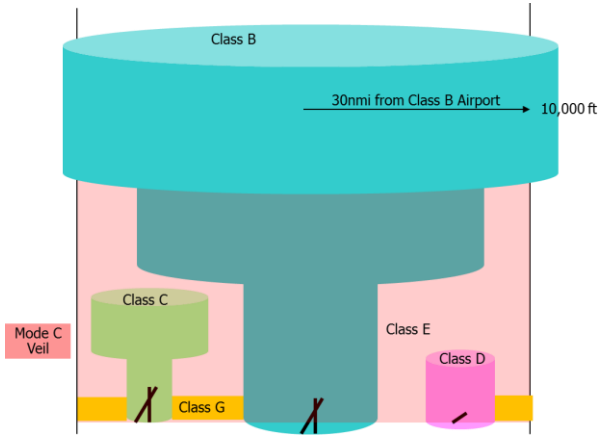
Example; Mode C Veil sUAS Cargo Delivery Operations ConOps (1 of 2)

- ConOps to enable small UAS (sUAS) cargo delivery operations within Mode C Veil
  - Development criteria; Implementable within 2 years (i.e., no rulemaking)
  - Utilized; OSED, Use Cases, Operational Scenarios, Cross Organizational SMEs
  - Considered prior research; Part 107, LAANC, UTM…
  - Outcome; A concept of operations that could be implemented to significant scale within two years

Example; Mode C Veil sUAS Cargo Delivery Operations ConOps (2 of 2)





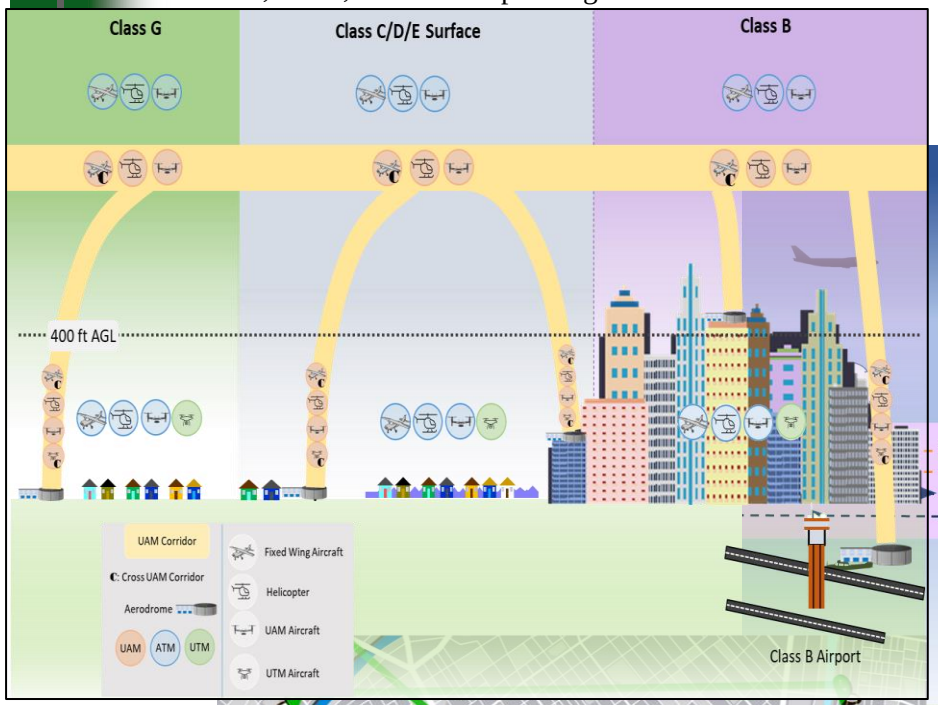


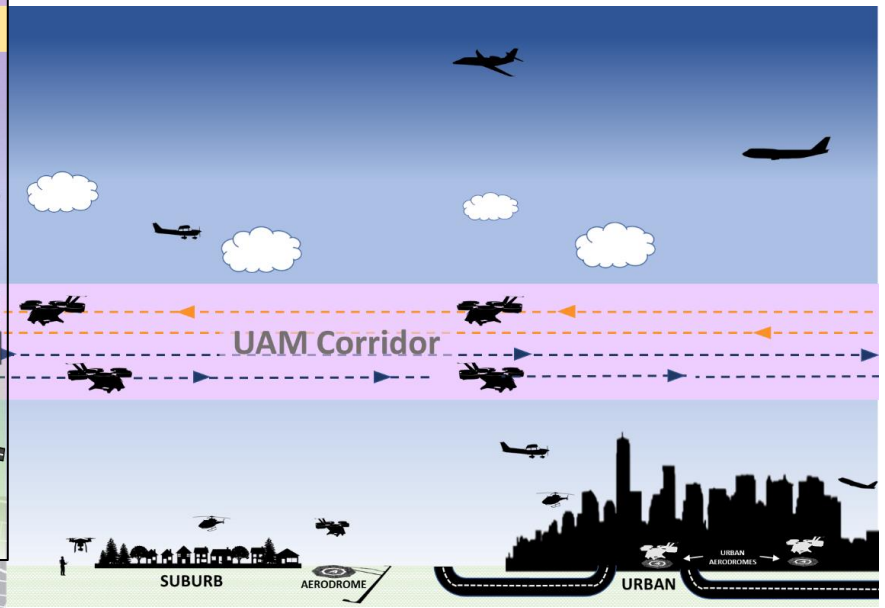
Example; Urban Air Mobility ConOps (1 of 3)

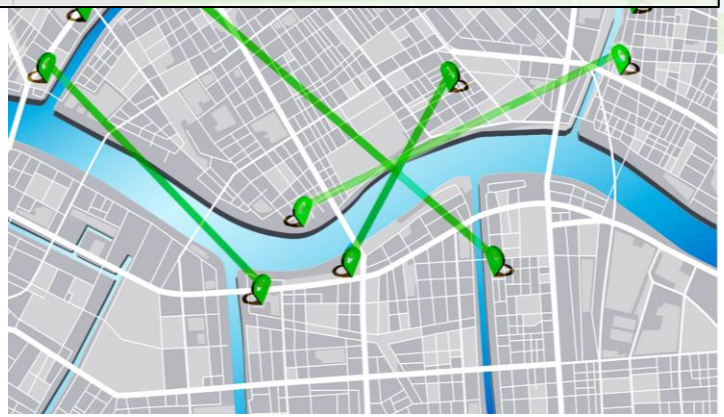
- Urban Air Mobility (UAM) ConOps v1.0
  - Development criteria; Concept that could be used to guide further research, designed to extend beyond initial ops
  - Utilized; Use Cases, Operational Scenarios, Cross Organizational SMEs
  - Considered prior research; FAA & NASA research in UAS, UTM, ETM, and AAM
  - Outcome; The FAA's first published UAM ConOps

Example; Urban Air Mobility ConOps (2 of 3)

UAM, UTM, and ATM Operating Environments







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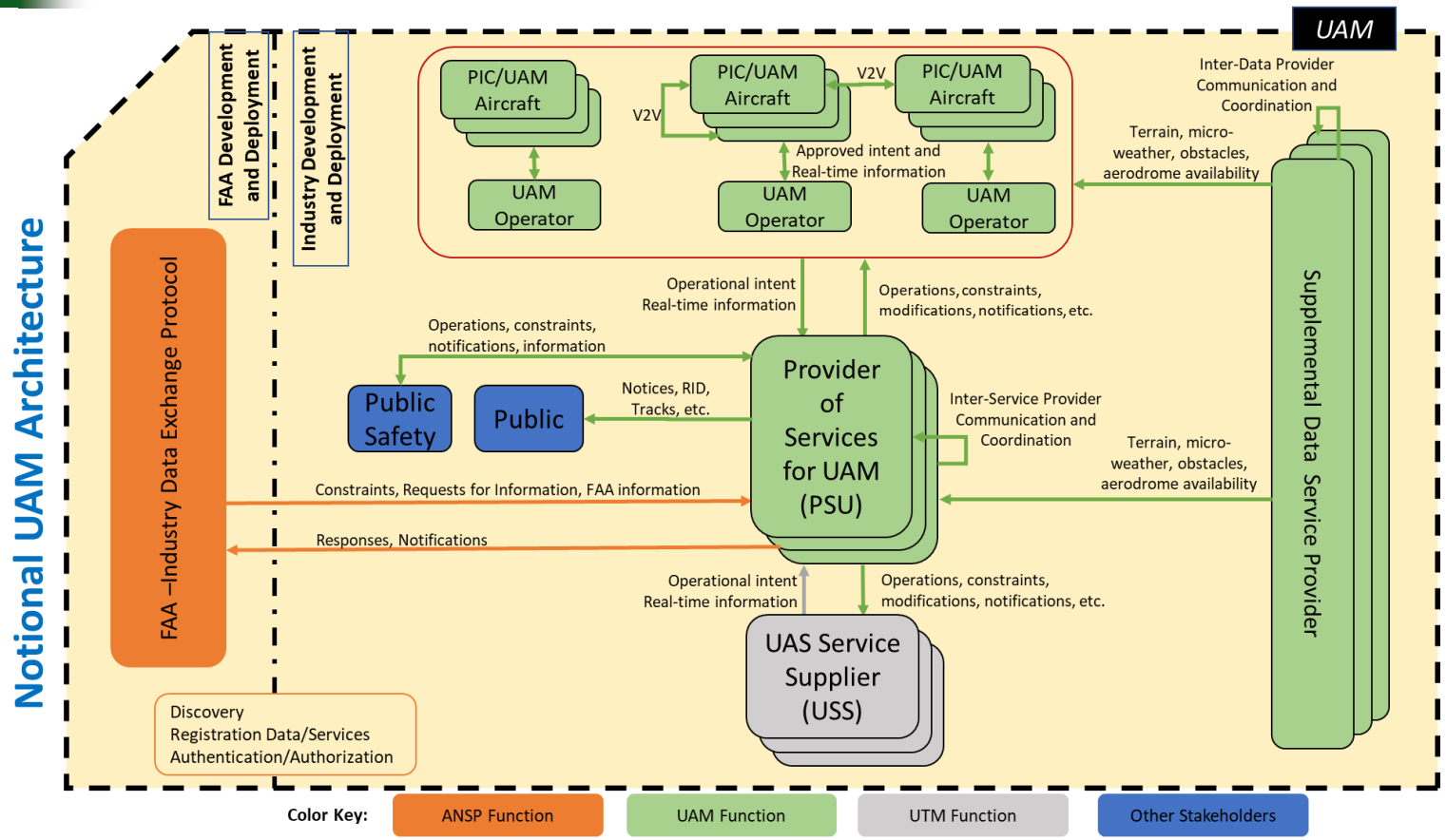
Example; Urban Air Mobility ConOps (3 of 3)



Notional UAM Architecture

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