



*THE GOLD STANDARD FOR AVIATION SINCE 1935*

## DACSC TG3 (UAS Funding) Recommendations for the Near Term



# Background

- Future success of the drone industry depends on government and private sector funding to support and facilitate the integration and operations of drones in the NAS.
- The FAA requires new resources to be devoted to this task.
- The FAA asked the DAC to provide near term funding recommendations by July 2017, and longer term recommendations by March 2018.
- TG3 was established to provide these recommendations.



# Assumptions and Guiding Principles

TG3 agreed to the following guiding principles:

- There will be a combination of government, industry, and shared funding across the integration efforts.
- Options for funding should not be constrained by the current traditional aviation funding structure, although in the near-term a new model may be difficult to implement.
- The recommended funding structure should not alter the current structure of funding for traditional, manned aviation.

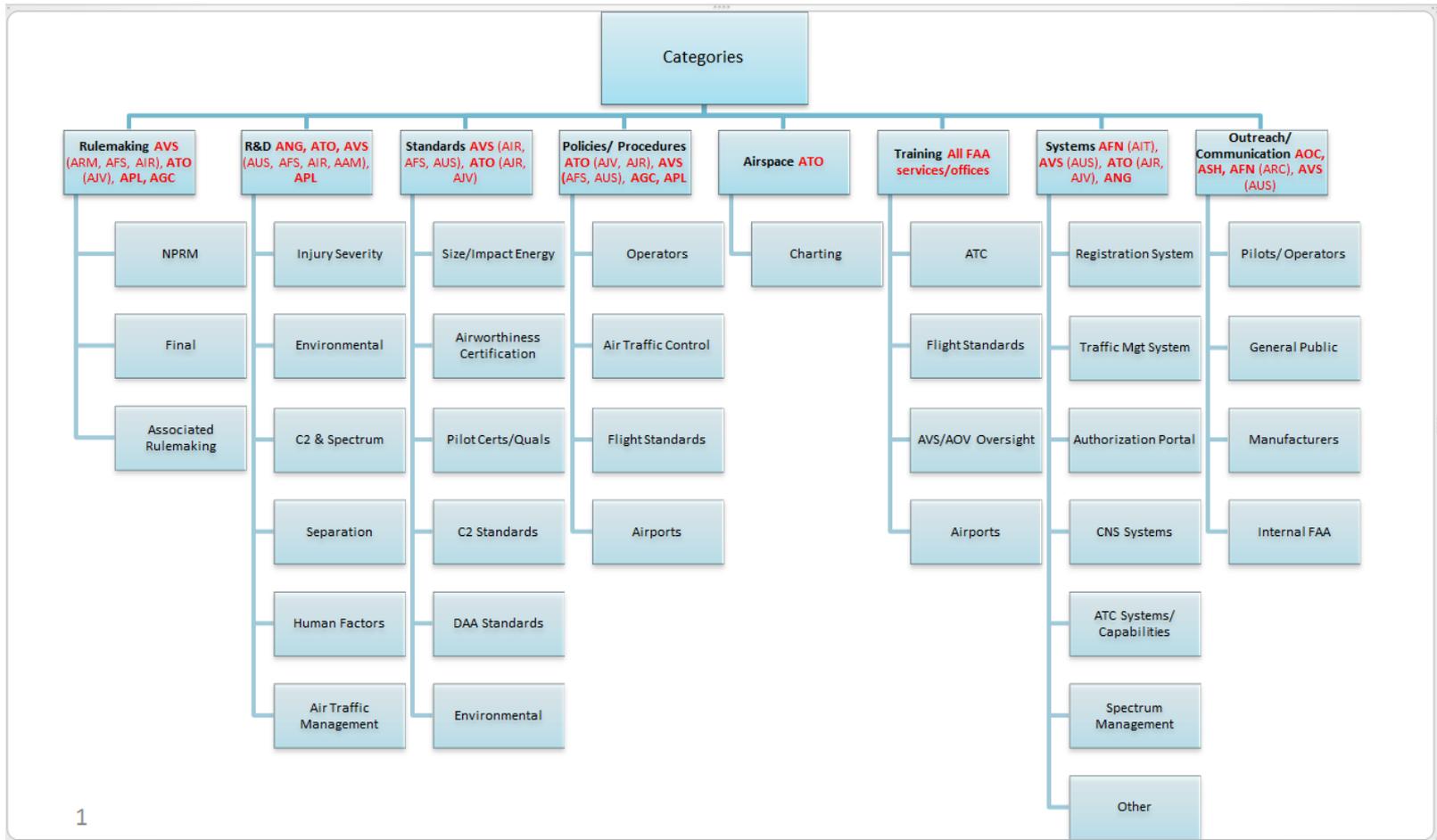


# Methodology

- We used the analytic hierarchy process (AHP) via “Decision Lens” to rank all FAA UAS activities against a comment set of criteria.
  - **Safety** among UAS operators, for people and property on the ground, and with current manned aviation, given a 60% weight.
  - **Enabling operations** and technological readiness, given a 28% weight.
  - **Economic benefits** to society and the government, given a 12% weight.
- The vast majority of members participated in the rating and ranking process.



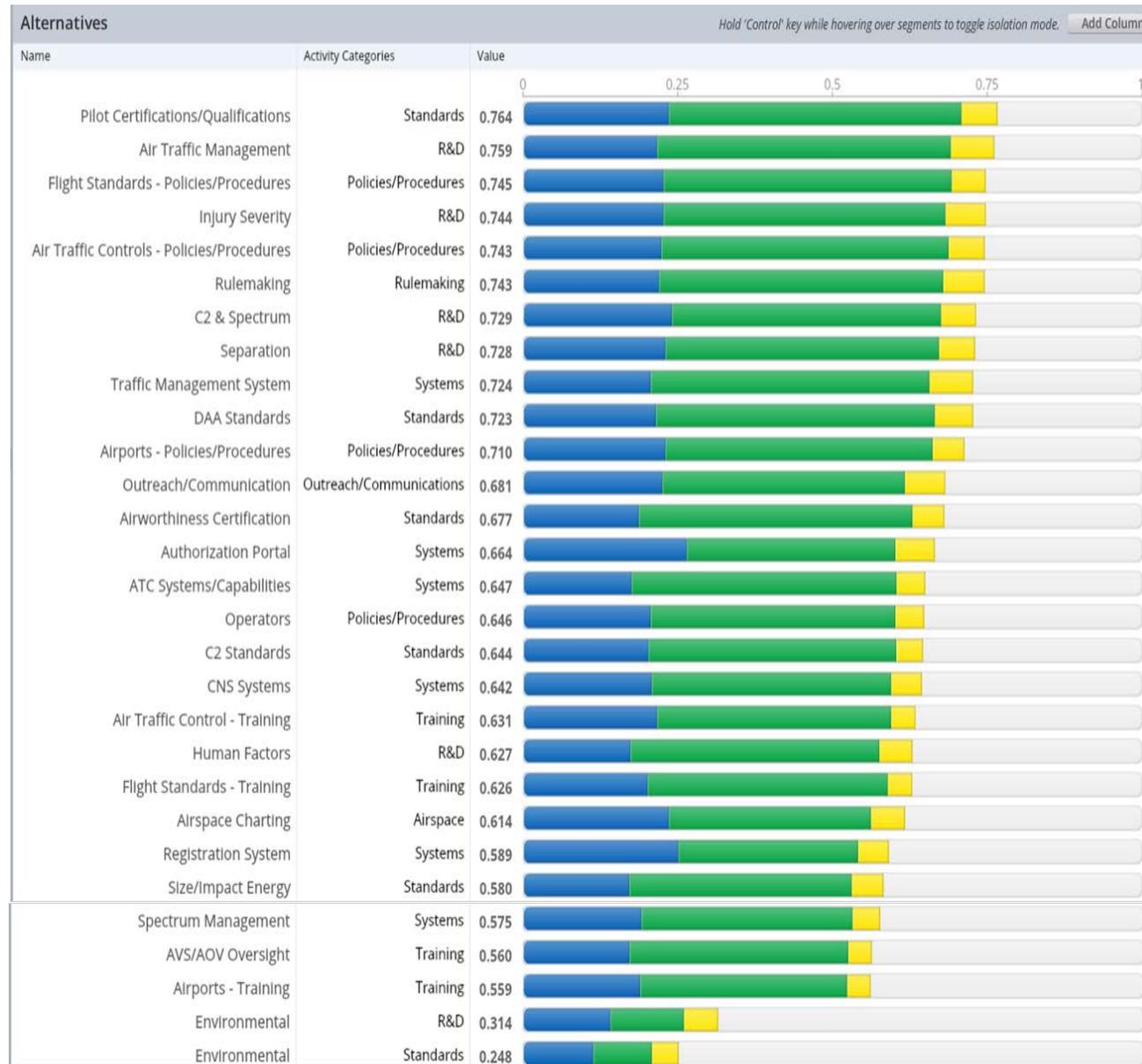
# Informing our Methodology – FAA UAS Activities





# Decision Lens Results

*A prioritized list of FAA activities*





# Work Flow

- The group validated the results and divided into teams. Each team worked through their prioritized results to define the short-term government, industry, and collaborative efforts to fund these activities and provided written recommendations.
  
- The reports were circulated and discussed, and consensus was reached on the recommendations.
  
- The groups also used the recommendations from TG2 to ensure there was common guidance across all three work groups:
  - Prioritization of UAS BVLOS operations within the Mode C Veil below 400 ft. AGL
  - Development of technology neutral navigation performance requirements
  - Evaluation of the ability of existing networks to meet low altitude UAS C2 requirements
  - Establishment of a FAR Part 135 regulatory pathfinder program for commercial UAS low-altitude BVLOS operations



# Recommendations

- All **regulations, policies, and standards** necessary in the next 24 months should be developed primarily by the FAA with significant industry input. We recommend that Congress appropriate additional funding and increase FAA staffing to address this ambitious work schedule.
- The **research and development, and system development** necessary in the next 24 months, should be shared between government and industry.
- **Communications**, outreach, and **training** necessary in the next 24 months should be shared between government and industry, depending on the activity.
- Any recommended funding structure should not alter the current structure of funding for traditional, manned aviation.
- In the future, the UAS industry may be expected to pay for the operation, maintenance, and modernization of an automated Unmanned Traffic Management (UTM) system through a yet-to-be-created “pay-for-what-you-use” funding model.



# Regulations

Costs for these priority efforts should be primarily bourn by the FAA. These rules include:

- Operations Over People (OOP)
- Identification and Tracking
- Section 2209 – Designation of prohibited/restricted airspace over fixed-site facilities
- Counter-drone Operations and Activities
- Expanded Operations (BVLOS, package delivery)
- Air Carrier Certification and Operations
- UAS Fee Structure



# Policies and Standards

Costs for these priority efforts should be shared, depending on activity:

- Flights Standards Policies
- Air Traffic Control Policies
- Operator Policies
- Airports Policies
- Pilot Certification and Qualification Standards
- Airworthiness Certification Standards
- Command and Control Standards
- Detect and Avoid Standards



# Systems and R&D

Costs for these priority efforts should be shared, depending on activity:

- **LAANC**

- Related R&D Activity: Air Traffic Management, C2 & Spectrum, Separation
- Related Systems Activity: Traffic Management System, Authorization Portal, ATC
- Systems/Capabilities, CNS Systems, Registration System, Spectrum Management

- **IT Gateway**

- Related R&D Activity: Air Traffic Management, Separation
- Related Systems: Traffic Management System, Authorization Portal, CNS
- Systems: Registration System

- **UTM**

- Related R&D Activity: Air Traffic Management, C2 & Spectrum, Separation,
- Human Factors, Environmental
- Related Systems: Traffic Management System, Authorization Portal, ATC
- Systems/Capabilities, CNS Systems, Registration System, Spectrum Management



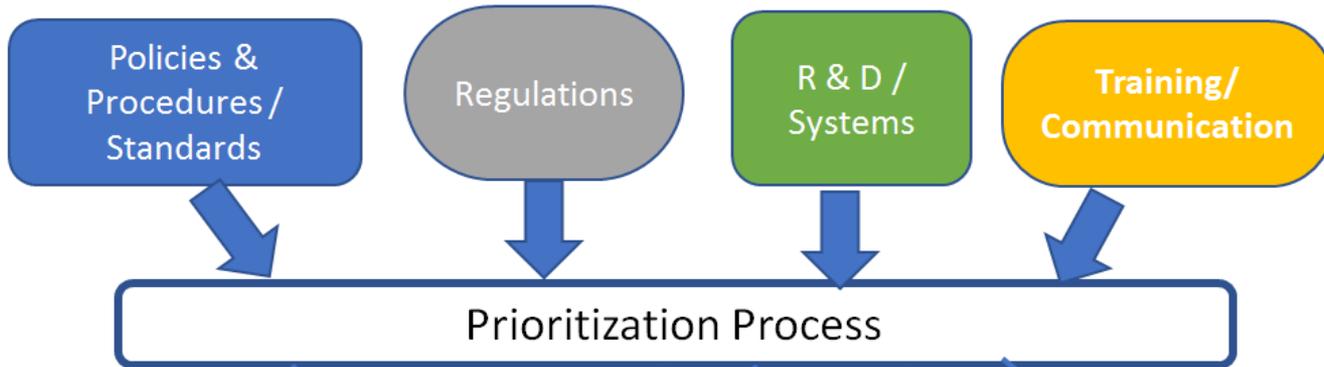
# Outreach and Training

Costs for these priority efforts should be shared, depending on activity:

- **Training**

- Air Traffic Control Training
- Flight Standards Training
- Airports Training
- AVS/AOV Oversight Training

- **Outreach and Communication**



**Policies & Procedures / Standards**

- Flights Standards
- Air Traffic Control P&P
- ▼ Operator P&P
- Airports P & P
- ▣ Pilot Certification and qualification Standards
- Air Worthiness Certifications
- ▣ Command and Control (C2) Standards
- ▣ Detect and Avoid Standards

**Regulations**

- Operations over people
- Identification and tracking
- Section 2209 – *Designation of prohibited or restricted airspace above certain fixed-site facilities*
- Security – *Counter-drone operations*
- Expanded Operations (*BVLOS, package delivery*)
- Air Carrier certification and operations
- Rule to establish fee structure to support UAS work of FA
- ▣ Airspace Charting

**R & D / Systems**

- ▣ LAANC
- ▣ IT Gateway
- ▣ UTM

**Training & Communication**

- Air Traffic Control Training
- ▣ Flight Standards Training
- AVS / AOV Oversight
- Airport Training
- ▣ Outreach

**Key**

- ▣ Shared Funding
- ▼ Industry Funding
- FAA Funding



# Activity and Funding List

<u>Priority</u>	<u>Activity</u>	<u>Lead Funding</u>
1	Pilot Certifications/Qualifications	Gov't. & Ind.
2	Air Traffic Management – R&D	Gov't. & Ind.
3	Flight Standards Policies/Procedures	Government
4	Air Traffic Controls - Policies/Procedures	Government
5	Injury Severity – R&D	Gov't. & Ind.
6	Rulemaking	Government
7	C2 & Spectrum – R&D	Gov't. & Ind.
8	Separation	Gov't. & Ind.
9	DAA Standards	Gov't. & Ind.
10	Traffic Management System	Gov't. & Ind.
11	Airports - Policies/Procedures	Government
12	Outreach/Communication	Gov't. & Ind.
13	Airworthiness Certification	Gov't. & Ind.
14	Authorization Portal	Gov't. & Ind.
15	Operators	Government
16	ATC Systems/Capabilities	Gov't. & Ind.
17	C2 Standards - Standards	Gov't. & Ind.
18	CNS Systems	Gov't. & Ind.
19	Air Traffic Control - Training	Gov't. & Ind.
20	Flight Standards - Training	Gov't. & Ind.
21	Human Factors – R&D	Gov't. & Ind.
22	Airspace Charting	Government
23	Registration System	Government
24	Size/Impact Energy	Government
25	Spectrum Management	Government
26	AVS/AOV Oversight	Government
27	Airports - Training	Government
28	Environmental – R&D	Gov't. & Ind.
29	Environmental - Standards	Government



# FAA Reauthorization and Appropriations

- FY17 FAA UAS Budget: +\$20M for ATO, +\$10M for AVS, and +\$2.67M for R&D (based on the FY17 President's Budget request).
- Authority for these funds runs through FY18.
- Significant portions of the House and Senate's FAA Reauthorization bills are dedicated to UAS. Many of the provisions come with new rulemaking and reporting requirements, which will strain already limited FAA budgetary resources.



# What's Next for TG3?

- The long term questions are more complicated.
  - Cost accounting measures?
- TG3 will consider options and identify self-sustaining and scalable funding sources that allow all users of the NAS to fund the necessary resources to ensure its safe and efficient operation.
- TG3 will work to identify a funding option for the UAS industry that is segregated from the system that funds manned aviation.
- The funding mechanism should be flexible enough to support potential far-reaching structural changes to FAA funding and activities.
- TG3 will consider new sources of funding for the long term, including user fees or similar pay-for-what-you-use services.



# Listening Session

- TG3 had a listening session on long-term issues on July 14<sup>th</sup>.
- It was open to the entire DAC SC, for as many options and voices to heard.
- What we heard.



Questions?



# Informing our Workflow – FAA UAS Integration



## Capital Investments & Automation



Ongoing Maintenance – \$\$

## Policy, Coordination, & Operations





# Informing our Workflow – FAA Definitions

- **Policies and Procedures:** Procedures that must be developed for air traffic control facilities, such as ARTCCs and other Air Traffic Management personnel, UAS operators, manufacturers, and other airspace users, to enable the operational milestones. Specific policies/procedures to be developed or updated include: Flight Standards, Air Traffic Controls, Operator Policies, Airport Policies, and Airspace Charting.
- **Rulemaking:** Key rulemaking activities needed to enable the milestone, as well as any relevant public law changes associated with the milestone that may be needed or expected.
- **Standards:** Standards needed to guide technical and operational aspects of the operational milestone; e.g., detect and avoid, pilot certification, aircraft and control station certification standards. Specific examples include: Pilot Certifications/Qualifications, DAA Standards, C2 Standards and Environmental Standards.
- **Outreach/Communication:** Any major outreach and communications efforts with the public, UAS stakeholders, other airspace users, Tribal Governments, or oversight organizations such as Congress, required to support safe implementation of the operational milestone, including a process to address concerns that may come up from communities, interest groups and individuals as UAS are integrated into the NAS
- **Training:** Any training of the FAA workforce that will be needed to enable the UAS activity. Specific examples of training include: Air Traffic Control Training, Flight Standards Training, AVS/AOV Oversight training and Airports Training.
- **R&D:** All R&D activities needed to determine solutions to unresolved or potential issues associated with that operational milestone; e.g., supporting performance-based requirements or safety analyses for Detect and Avoid (DAA). Specific R&D examples include: Air Traffic Management, Injury Severity, C2 and Spectrum, Separation, Human Factors, and Environmental Research.
- **Systems:** Any infrastructure development or modification needed to enable the operational milestone; e.g., ATC systems, communications, navigation, and surveillance (CNS) infrastructure, and UAS operator support systems such as the registration system. Specific examples of FAA Systems include: Traffic Management System, Authorization Portal, ATC Systems/Capabilities, CNS Systems, Registration System, and Spectrum Management.