Exhibit 1

TERMS OF REFERENCE

Drone Advisory Committee (DAC)

Committee Leadership

Role	Name or Title	Organization
Chairman	Brian Krzanich	Intel
FAA Lead	Administrator	FAA
Designated Federal Officer	Deputy Administrator	FAA
Subcommittee Oversight	Director, UAS Integration Office	FAA
Secretariat Oversight	Director, UAS Integration Office	FAA
Secretariat	VP of Aviation Technology and Standards	RTCA
Support	Program Director	RTCA

Background

Unmanned Aircraft Systems (UAS) offer the United States the opportunity to lead a completely new and expanded vision of aviation. The FAA seeks to establish a venue and process to enable stakeholders to advise the FAA on the needs of these new and expanding users of the National Airspace System (NAS) while identifying the strategic regulatory priorities and structure that simultaneously promote innovation, safety, efficiency and rapid integration of UAS into the NAS.

The best mechanism to leverage all the resources, expertise and energy to achieve the FAA and industry's goals of safe and timely integration of all categories of UAS into the airspace, is through an open, transparent venue of a federal advisory committee (FAC). As with all FACs, the Drone Advisory Committee (DAC) will be designed to: ensure transparency, include broad and balanced representation across the industry, encourage innovation and remain consistent with US anti-trust laws.

Purpose and Scope
The purpose of the DAC is to provide an open venue for FAA and UAS stakeholders to work in partnership to identify and recommend a single, consensus-based set of resolutions for issues regarding the efficiency and safety of integrating UAS into the NAS and to develop recommendations to address those issues and challenges. The DAC will also provide the FAA with recommendations which may be used for tactical and strategic planning purposes. The DAC is comprised of executive leaders from key unmanned aircraft stakeholders as well as key stakeholders in the manned aviation community. The DAC will track and report progress and activities of FAA-approved Task Groups, provide suggested guidance for their work, and will coordinate final products for submittal to the FAA Administrator. Each FAA-approved Task Group will have a specific, limited charter that is developed by the DAC and is approved by the FAA Administrator. Unless otherwise stated, Task Groups will be sunset upon completion of deliverables as documented in their respective charter(s). Task Groups may be cancelled prior to completion of specified deliverables in accordance with the terms in their respective charter(s).

Structure of the Committee:
The DAC will conduct its deliberations on recommendations to be provided to the FAA in meetings that are open to the public. To meet the criteria described above, the Committee structure will be two-tiered with subordinate Task Groups (TG) established to develop recommendations and other documents for the Committee.

Adjunct to the DAC is a Subcommittee (DAC Subcommittee or DACSC) comprised of members with broad knowledge and expertise related to the integration of drones into the airspace system. Some meetings of the DACSC will be open to the public to provide an early opportunity to identify potential concerns associated with draft recommendations.

The DAC may establish TGs to accomplish specific tasks as described above. Depending upon the type of tasking, TG products will either be presented to the DACSC for review and deliberation, then forwarded to the DAC or they might be presented directly to the DAC. Members of TGs will be appointed by the DACSC Co-Chairs in consultation with the RTCA President and DAC Chairman and DFO. TG meetings will not be open to the public. For each TG group that is established, the DAC will approve Terms of Reference defining the objective, scope, membership, specific tasks and deliverables with a schedule. Unlike the DAC and DACSC, members of TG do not represent a particular affected entity and are selected for their expertise in the subject matter rather than their affiliation. TG will disband upon delivery of their recommendations as appropriate.

Responsibilities
    a) Drone Advisory Committee (DAC)
1. Overall direction of Committee
2. Review and approve recommendations to FAA
3. Field requests from FAA
4. Review and approve creation of Work Groups, as appropriate
5. Meet three times per year in Plenary (open to public)
6. Direct work of DACSC

b) DAC Subcommittee (DACSC)
    1. Staff to Advisory Committee
    2. Guide and review selected work of TGs, present findings to DAC
    3. Meet bi-monthly or as needed (not all open to public)
    4. Forward recommendations and other deliverables to DAC for consideration

c) Task Groups
    1. Created to address specific tasking
    2. May be short-term or standing activities

Intended Use of DAC Outputs

The end goal of the work done by the FAA and industry, in response to DAC recommendations is to lead to the timely, safe and efficient integration of all categories of UAS into the NAS. The output of the committee will inform the FAA of industry consensus on the areas of FAA tasking. Based on the FAA's response to the committee's recommendations, additional tasks could be assigned to the committee, the committee's working groups and task groups, or outside committees and groups such as ARCs, Standards Committees and research organizations.

Membership and Designation

RTCA provides DAC membership recommendations to the DAC chair and FAA Administrator. Final membership selections, including the DAC chair, are at the discretion of the FAA Administrator. The committee is structured to ensure a balance of various UAS and manned aviation stakeholders. Additional members may be added at the discretion of the FAA Administrator. The DAC functions as a Federal advisory committee with meetings that are open to the public, unless otherwise noted as authorized by section 10(d) of the FACA and applicable regulations, with records subject to Freedom of Information Act, 5 U.S.C §552(b).

The DAC will be comprised of CEO/COO-level executives from key UAS stakeholder organizations. The DAC will leverage the RTCA expertise, and state-of-the-art facilities and tools to enable responsive and inclusive coordination across stakeholders with a wide range of philosophical positions and based in many different geographic locations.

To ensure that the DAC brings together the key stakeholders in the integration of UAS into the national airspace system, DAC Membership recommendations should include the following considerations:
a) Who are the stakeholders of the UAS Community?
b) What are the areas of interest for the UAS Community?
c) Membership must be fairly balanced in terms of the points of view represented and the functions to be performed by the advisory committee
d) Membership must be justifiable to the public and elected officials.
e) In addition to the above requirements DAC membership must have the following characteristics:
f) Executive level membership who can speak for and commit their organizations

    g) Flexibility to reach out to necessary segments of the aviation community to answer specific requests from the FAA
    h) Membership may not exceed 35 voting members, unless approved by the FAA Administrator
    i) Ability to partner with other UAS stakeholders through substantive dialog and the capability to reach timely consensus on recommendations
    j) Appropriate expertise as reflected in the following areas of interest:
        1) UAS Manufacturers (all sizes)
        2) UAS Operators (all sizes)
        3) Drone Hardware Component Manufacturers
        4) Drone Software Application Manufacturers
        5) Traditional Manned Aviation Operators
        6) Airports and Airport Communities
        7) Labor (controllers, pilots)
        8) R&D, Academia
        9) Local Government
        10) Navigation, Communication and Surveillance and Air Traffic Management Capabilities Providers
        11) Other specific areas of interest as determined by the Administrator

Other stakeholders might be added later if appropriate. Non-voting members selected by the Administrator who may attend as observers and have access to the committee's online workspace managed by RTCA, will include:
        1) Other Federal Agency personnel
        2) Other FAA personnel

Ongoing Tasking – Development of Recommendations

DAC recommendations must:

- Inform the FAA of consensus industry positions on specific topics that will advance UAS integration into the NAS.
- Increase safety, security, system capacity, and efficiency
- Be consensus based and articulate required resources
- Define requirements for joint private/public partnership activities

As with any federal advisory committee, the FAA is not obligated to act on any of the DAC's recommendations. However, the FAA will issue written response for DAC recommendations within 60 days of receipt. FAA's response to DAC recommendations may result in the establishment of Aviation Rulemaking Committee(s) to address rulemaking requirements, the assignment of specific activities to Task Groups through the DAC, or other actions as approved by the FAA Administrator.

Considerations and Questions for the development of DAC recommendations

DAC recommendations should include the criteria or address the questions listed below:

    a) Must be actionable, with a specific stated recommended outcome or end state
    b) Must include an accurate and comprehensive characterization of the suggested capability or policy development; provisions for the "use of service" or "concept of operations"; and the FAA's role (e.g. provide service, qualify service providers, have a "hands off" approach)

c) Are the operational concepts flexible enough to apply to a broad range of business applications?

d) Will the recommendation inform the development of minimum performance standards?

e) Will the recommendation impact safety, efficiency, manufacturing, or innovation?

f) What are the interoperability concerns, among competing technologies and between industry automation and FAA automation?

g) What is the duration or longevity of the proposed recommendation?
Whether additional rulemaking makes sense for the community

Operating Norms

- The charter for the DAC will be for a two-year term and may be extended or revised at the discretion of the FAA Administrator. If the Administrator elects not to renew the DAC charter at the end of the two year period, the DAC will terminate.
- The term of the DAC chair will be for two years; the chair may be invited by the FAA Administrator to serve multiple consecutive terms.
- DAC Committee members are appointed for two-year terms. Members may be invited by the FAA Administrator to serve multiple consecutive one-year terms after the initial two-year term. Members may also be removed from the DAC by agreement between the DAC Chair and FAA Administrator.
- The FAA DFO, DAC Chairman, and RTCA President will review DAC Committee membership yearly to ensure balanced representation that equitably represents, to the extent feasible, the UAS stakeholder community.
- Membership is based on the ability to represent the interests of an organization or constituency authoritatively and effectively.
- The DAC will be expected to meet schedule deadlines and members will be expected to work toward consensus to the greatest extent possible. The DAC will follow RTCA guidance for handling dissenting opinion(s). If consensus is not reached within the timeframe dictated for each product, the DAC shall document majority and dissenting recommendation(s) and deliver to the FAA UAS Board.
- The DAC will hold at least three plenary meetings per year (open to the public), as well non-public preparatory telecons to ensure continuity and good preparation for public meetings
- Task Groups meet as specified in their individual charters.
- As appropriate, Task Groups will reach out to individual experts and other outside groups to assist in developing UAS integration related recommendations

DAC Subcommittee (DACSC) Oversight

The Director of the FAA UAS Integration Office will oversee the DAC Subcommittee and will function as the liaison to the FAA lines of business that have key roles to play in the integration of UAS into the NAS.

Secretariat

- The FAA's UAS Integration Office will oversee the execution of DAC Secretariat functions
- RTCA will function as the Secretariat for the DAC and any Task Groups and will work with the FAA's UAS Integration Office and others within the FAA, including the DFO or the UAS Board, for scheduling meetings, assembling agenda(s), taking meeting minutes, keeping records on

costs, coordinating meeting logistics, and publishing of Federal Register Notices and meeting minutes.

- Proposed agenda items with approximate duration are to be submitted to Secretariat at least 30 days prior to the scheduled date of a meeting. The Secretariat, in consultation with the UAS Integration Office, the DAC Chair, and the DFO, shall refine the scheduled duration of the meeting and promulgate the meeting agenda to the Committee members.
- The Secretariat will also coordinate the writing and approval by both the FAA and the DAC Chair for any media releases or public statements.
- RTCA will maintain an online workspace to facilitate the consensus process of the committee. Content of the DAC workspace will include calendar, roster, documents created by the DAC, documents under review, background materials for meetings, meeting minutes among other things. Workspace will also be used to facilitate document review and commenting in the final stages of the consensus process.

Conduct of Meetings
- Advisory Committee members will receive all information needed to prepare for the meeting (e.g., Task Group progress reports; Task Group products and recommendations for Committee action) at least fifteen (15) calendar days prior to the meeting from the DAC Secretariat
- With the exception of routine administrative items, agenda items will generally be supported by written reports or formal briefing material as appropriate.
- In accordance with the Federal Advisory Committee Act, meeting summaries and related information will be available to the public via RTCA's website. Documents undergoing final review can be obtained by contacting RTCA. Members of the public may also submit comments on documents undergoing final review.

External Coordination: The DAC will consult with and consider the work of the following groups (at a minimum) to avoid overlaps and gaps:
- NASA UTM Program
- NASA "UAS in the NAS" Program (for validation and verification support as appropriate)
- Other FAA ARCs as appropriate or directed by the FAA
- Other RTCA Special Committees, e.g., SC-228
- Other Standards bodies tasked by the FAA
- Inter-agency SARP
- FAA UAS Test Sites
- FAA Pathfinder Program
- FAA Center of Excellence for UAS (COE UAS)
- UAS ExCom
- Other Task Groups or Teams established by the FAA
- Others as appropriate

Exhibit 2

**Federal Aviation
Administration**

FAA Administrator Makes Two Major
Drone Announcements

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Speaking today at the AUVSI annual conference in New Orleans, FAA
Administrator Michael Huerta announced the agency is establishing a
broad-based advisory committee
(http://www.faa.gov/uas/programs_partnerships/dac/) that will provide
advice on key unmanned aircraft integration issues. He also announced plans to
make it easier for students to fly unmanned aircraft
(http://www.faa.gov/uas/resources/uas_regulations_policy/media/Interpretation-
Educational-Use-of-UAS.pdf) (PDF) as part of their coursework.

Huerta said the drone advisory committee is an outgrowth of the successful
stakeholder-based UAS registration task force and the MicroUAS aviation
rulemaking committee.

Those panels were set up for a single purpose and for limited duration. In contrast,
the drone advisory committee is intended to be a long-lasting group. It will help
identify and prioritize integration challenges and improvements, and create broad
support for an overall integration strategy.

"Input from stakeholders is critical to our ability to achieve that perfect balance
between integration and safety," Huerta said. "We know that our policies and overall
regulation of this segment of aviation will be more successful if we have the backing
of a strong, diverse coalition."

Huerta said he has asked Intel CEO Brian Krzanich to chair the group.

Huerta also announced the FAA will start allowing students to operate UAS for
educational and research purposes today.

As a result, schools and students will no longer need a Section 333 exemption or
any other authorization to fly provided they follow the rules for model
aircraft. Faculty will be able to use drones in connection with helping their students

with their courses.

"Schools and universities are incubators for tomorrow's great ideas, and we think this is going to be a significant shot in the arm for innovation," Huerta said.

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Exhibit 3

**Federal Aviation
Administration**

Press Release – Drone Advisory Committee to Hold Inaugural Meeting

For Immediate Release

August 31, 2016
Contact: Laura Brown or Les Dorr/laura.j.brown@faa.gov, les.dorr@faa.gov
Phone: 202-267-3883

WASHINGTON – The newly established Drone Advisory Committee (DAC) will hold its inaugural meeting on September 16 as the Federal Aviation Administration (FAA) continues to builds on its strong record of collaborating with the aviation community to safely integrate unmanned aircraft into the nation's airspace.

In May, FAA Administrator Michael Huerta asked Brian Krzanich, Chief Executive Officer of Intel Corp., to chair the advisory committee and to partner in the process of choosing members that represent a broad base of aviation users. Nearly 400 people and organizations expressed interest in becoming part of the committee.

After reviewing the expressions of interest, the FAA invited members to serve on the committee. These members represent a wide array of stakeholders, including unmanned aircraft manufacturers and operators, traditional manned aviation groups, labor organizations, radio and navigation equipment manufacturers, airport operators and state and local officials.

"Safety is a shared responsibility in which each of us plays a vital role," said Huerta. "We know from experience that the FAA's polices and overall regulation of small unmanned aircraft will be more successful if we involve a strong and diverse coalition."

"Drones will be one of the great computing platforms of the future. It's an honor to serve as the Chair of the Drone Advisory Committee. I look forward to promoting innovation in drone technology that will improve people's lives while spurring economic growth," said Krzanich.

The DAC was formed under the RTCA federal advisory committee and will meet at least three times a year. Members will discuss key issues and challenges associated with integrating unmanned aircraft in the world's busiest and most

complicated airspace system. The committee will conduct more detailed business through a subcommittee and various task groups that will help the FAA prioritize its activities, including the development of future regulations and policies.

The Drone Advisory Committee is modeled on the highly successful NextGen Advisory Committee, which regularly consults on the ongoing development of the NextGen Air Transportation System. NextGen is a multi-year, multi-billion dollar program to modernize the National Airspace System through the use of satellite-based navigation procedures and advanced computer and communications technology.

The FAA sent a notice to the Federal Register providing details about the first meeting of the newly established Drone Advisory Committee (DAC).   The notice is expected to be published in the Federal Register this week. The membership of the DAC will be posted on the RTCA website at www.rtca.org

Drone Advisory Committee Meeting:
The inaugural Drone Advisory Committee Meeting will occur at 9:00 a.m. on Sept. 16 at the Center for Strategic and International Studies, 1616 Rhode Island Avenue, NW, Washington, DC, 20036.

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This page was originally published at: https://www.faa.gov/news/press_releases/news_story.cfm?newsId=20754

Exhibit 4

DAC Meeting September 16, 2016 Meeting Minutes

- Call to order

- Margaret Jenny, President of RTCA welcomed participants

- The Designated Federal Official (Victoria Wassmer) read the DFO statement

- FAA Administrator Michael Huerta delivered opening remarks

  ➢ Mr. Huerta welcomed the members of the DAC to the meeting and thanked them for agreeing to serve on the committee. He stressed the need for a faster process for innovation to get into the NAS. The FAA has made great strides in integrating UAS through the UAV Registry and Part 107 rules release. The Drone Advisory Committee is modeled on the successful NextGen Advisory Committee and is expected to provide guidance to the FAA on what's important to the industry. The DAC has a mix of representatives to strengthen it and reflect the diversity of NAS users.   Stating the DAC should create its own "to-do" list, he encouraged the committee to discuss the things that are most important to the industry as a whole.

- DAC Chairman Brian Krzanich delivered opening remarks for the committee

  ➢ Over 400 applicants applied for the committee. The diversity of the selected members is a strength. The work the FAA has done to date to facilitate the integration of drones into the airspace must be recognized and the DAC work aligned with what came before: Registration ARC, Pilot Certification rules, Part 107 release, and the 333 Waivers. The next steps will help shape the UAS integration effort of the future. There will be quick wins, but the real work will be reaching consensus with such a diverse group of stakeholders. As Chair, he will ensure every voice is heard. That does not mean that everyone will get 100% of what they want, but that all members will have a chance to shape the recommendations to the FAA and so should also support what is recommended.

- The members then introduced themselves and the organization that they represent

- RTCA president Margaret Jenny then gave a brief overview for the Federal Advisory Committee Act (FACA) including:

  ➢ Overview of RTCA & Federal Advisory Committees

  ➢ FACA Guidelines & Principles

  ➢ Consensus Process

  ➢ Dissenting Opinion

  ➢ Key Committee Positions

  ➢ Terms of Reference: Charter for the Committee

  ➢ Operating Norms

  ➢ FAA Guidelines for Recommendations

  ➢ FAA Response to DAC Recommendations

➤ Expectations of Committee Members

➤ Collaboration Workspace

- Chairman Krzanich then addressed his expectations for the members. The committee is a forum for ideas to be introduced and heard. Listen to comments from fellow members and act as a team. Consensus is the goal in all recommendations. The DAC is strictly an advisory committee. This first meeting will establish the goals of the committee

  ➤ Hear what was done to date

  ➤ Review the results of the DAC member survey

  ➤ Set priorities for moving forward

- Mr. Marke "Hoot" Gibson of the FAA presented

  ➤ The Objectives for the First Meeting

    ➤ Develop a functioning team

    ➤ Understand Federal Advisory Committee Act (FACA) rules

    ➤ Review current UAS landscape

    ➤ Discuss UAS activities in FAA Reauthorization

    ➤ Review survey results and through discussion, drive toward focus areas for subcommittee work

  ➤ Objectives for the First Year

    ➤ Maintain working knowledge of FAA's UAS integration strategy and its constraints

    ➤ Advise the Administrator on gaps in the FAA UAS integration strategy & provide recommendations

    ➤ Provide a consensus position on the FAA's five-year UAS CONOPS and its priorities

    ➤ Given FAA UAS integration plan advise on legislative strategy and priorities

- Mr. Earl Lawrence of the FAA presented the current landscape for drone integration, including:

  ➤ Current Regulatory Environment

  ➤ Growing Stakeholder Community

  ➤ Unmanned vs. Manned Aircraft Registration

  ➤ Part 107 Daily Recap – September 14

  ➤ Remote Pilot Forecast

  ➤ Small UAS (non-model) Fleet

  ➤ UAS Strategic Priorities

  ➤ FAA UAS Integration Strategy

  ➤ Key 2016 and Key 2017-18 Milestones

- ➢ Consensus-Building is Key to Speed

- FAA Assistant Administrator of Policy, International Affairs & Environment Jennifer Solomon then delivered an address on the current FAA Reauthorization Act. Including:

  - ➢ Since the expiration of that law last year, the FAA has had three short term extensions. Most recently, on July 15th, the President signed the HYPERLINK "http:///h" \h FAA Extension, Safety, and Security Act of 2016, which extends FAA authorities through September 30, 2017.
  - ➢ ·And while the authorization is short, it's also packed with new requirements that the agency must complete on the compressed timeline. Roughly 20% of the law is devoted to new UAS policy.
  - ➢ ·These provisions were not developed in a vacuum. Some reflect the concerns and fears articulated in front page stories about drones near airports or UAS interfering with wildfire suppression, others seek to address very specific industry interests, and others stem from ideas over how the federal government should prepare for future growth in the industry.
  - ➢ ·When you hear the FAA speak about the importance of building consensus around priorities for drone integration, it's helpful to remember that the FAA is working with finite resources, and the budget is a zero sum game.
  - ➢ ·New taskings that do not come with new resources will draw directly from ongoing work, slowing or stopping progress in those areas.
  - ➢ ·It behooves all of us to work together to identify clear priorities, elevate the best solutions, and build broad consensus to support those objectives. That will enable the FAA to execute drone integration in the most effective manner possible.
  - ➢ ·Another key element of success for the FAA, or for any large, operational organization, is a stable and predictable environment. A focal concern with the most recent authorization is that it extends the FAA's authorities by less than 15 months, which does not provide the agency with the long term stability needed to effectively manage and implement our key initiatives.
  - ➢ Chief among the FAA's priorities is the passage of a long-term reauthorization that ensures stable and predictable funding. ·This overarching priority enables the FAA to move forward with other priorities. Not all of these will apply to each segment of the aviation community, but the FAA provides an airspace system to all users, and improvements in one area offer benefits to many.

  - ➢ Congress is very interested in the UAS question; Solomon reminded the committee that before the FAA can act on any direction from Congress, funding must be secured and allocated; Authorization extends out less than 15 months which gives little ability to set long term goals. Nearly 20% of the Reauthorization wording is devoted to UAS. Her final message was that the best way to move the needle on UAS integration is through the DAC venue, and not through legislative direction.

- RTCA Vice President and DAC Secretary Al Secen then presented a summary and analysis of the results of the DAC Survey that members completed prior to the meeting. The survey was created to gain insight into members' priorities, sensitivities, and organizational goals. The

survey asked members to weigh in on Top Priority Issues the DAC should tackle. A summary of their input follows:

➢ There is near consensus on perceived public concerns; FAA strategic plan alignment and top technological concerns for industry

➢ Consensus is yet to be reached on: Pace of integration efforts; Focus of priorities going forward; Top three issues facing UASs in the airspace

➢ Access to airspace is a priority;

➢ Safety is essential and must be addressed;

➢ Drone applications are many and diverse;

➢ Operational priorities include low altitude BVLOS, VLOS;

➢ The most pressing public perception issues are: safety and privacy;

➢ DAC members raised a broad array of regulatory concerns, with safety assurance high;

➢ In the technology arena: collision avoidance ranked #1;

➢ Most members are seeking access in 6 months to one year;

➢ The pace of integration is between appropriate and too slow

The committee members discussed what they should tackle with respect to certification, and agreed it included Certification; BVLOS Conops; Performance Standards; Software/Hardware; Autonomous Operations. Ms. Jenny also reiterated the FAA and DAC Chairman's belief that they should quickly establish DAC Subcommittee staffed with a representative from each DAC member along with additional member organizations from pool of DAC applicants and others as appropriate to address high priority issues. The first meeting should be scheduled prior to the end of October. Ms. Jenny provided an example of a similar advisory committee, the NextGen Advisory Committee, and how its subcommittee operates. It was suggested that the first task for the DAC Subcommittee would be to prioritize the remaining list of issues for the DAC to take on.

• The committee then discussed the survey results. Key points of the dialogue are captured below:

➢ Safety is very important and the privacy of the public must be maintained

➢ Basic guidelines for UAS use are needed because there are no clear guidelines for what can fly and how

➢ Pathfinders are nimbler and of greater value to the UAS community than large efforts or contracts

➢ Initiatives on specific outcomes need to be addressed: challenges abound; research efforts not regulatory efforts are needed

➢ The DAC need to think like futurists: autonomy and UAS will intersect earlier than later. There needs to be a social science view to integration

➢ Safety and trust are mutually agreed upon by all members: the public wants these two aspects to be front-and-center to any integration effort

➢ There needs to exist a list of questions that, when answered, will indicate if a UAS design or operator is ready to integrate into NAS. A checklist of items that can be answered

Yes/No, or short answer that will give a clear indication to operators/manufacturers of whether they are cleared to fly

- ➢ Many UAS users are not educating themselves to be good citizen UAS operators; More education is required

- ➢ Safety and cybersecurity are tightly bound in the airspace integration problem space

- ➢ Public perception is evolving; aviation is an enviably safe industry, but is very cautious. Those two attributes are linked; Quick and innovative necessarily clashes with safety culture. We must determine what the country wants

- ➢ How will the public be engaged in this discussion? The whole scope of UAS must be addressed and, if the DAC finds it necessary, may engage the public in some way yet to be determined.

- ➢ There is concern among the innovators that the FAA will be too conservative and restrictive

- ➢ The issue of pre-emption was introduced: the FAA has the authority to control the airspace; the public reasonably expects peace and privacy: UAS conflict with that; Local officials representing constituents shared that people want a clear Federal pre-emption process to allow localities to set UAS rules – this needs to be answered

- ➢ The survey provides insight but is not exhaustive or scientific, and so additional work must be done to identify the top priorities for the DAC

- The committee broke for lunch at 12:00

  - ➢ Upon return from lunch, the committee began the discussion to identify issues with the direction that they not SOLVE the issues, simply identify them. Discussion areas included:

  - ➢ Certification

    - ➢ Certification means different things to different people and can cover many areas. The DAC members listed the following as pertinent to drones and therefore areas the DAC should consider. Beyond Visual Line of Sight; Performance Standards; Software/Hardware issues; Federal Pre-emption; Privacy; Cybersecurity; and autonomous operations

    - ➢ The DAC is not limited by size or class of UAS in its discussions

    - ➢ Collaborative versus non collaborative UAS have to be addressed, perhaps developing specific Detect and Avoid scenarios

    - ➢ A regulatory framework that is easy to navigate would be beneficial

    - ➢ Roles and responsibilities of the various players in the UAS industry and NAS must be discussed

    - ➢ An "appropriate level of safety" must be defined, risk averse versus risk tolerance

    - ➢ Don't ignore software issues as it's a significant component of UAS and the ground control

    - ➢ Should system safety requirements be commensurate with the size of the aircraft?

- ➢ What are the relative roles of certification and minimum operational performance standards (MOPS)? Could MOPS help with certification?

- ➢ Lost link procedures have to be taken into account by any safety assessment

- ➢ Reuse existing frameworks as much as possible

  - It is felt that reusing manned aircraft certification frameworks would be onerous to UAS

  - There needs to be a tailoring mechanism for the size and capabilities of the UAS – Global companies build UAS, so there needs to be global harmonization

  - The existing framework "buckets" are valid – we just need to tailor them

  - A safety certification philosophy, not prescription, will allow innovation to prevail

- ➢ We should consider the need not only for minimum performance standards, but also more prescriptive interoperability standards where necessary to ensure that many drones can operate at the same time in shared airspace.

- ➢ Privacy Pre-Emption

  - ➢ The committee discussed the privacy issues and the question of who has jurisdiction over them

  - ➢ It was noted that the FAA only regulates for safety – not the use of the vehicle

  - ➢ Many members felt that the DAC should try to provide some clarity to prevent future problems regarding roles and responsibilities with respect to privacy

  - ➢ There are over 280 State bills affecting UAS – chaos results when too many local laws are enacted – a strong federal role is needed

  - ➢ The is a strong need to work with local and state government and outreach to educate and inform

  - ➢ There needs to be a national guideline created that local government can use to set policy

  - ➢ Where do federal agencies enter into the effort when an airport is forced to investigate a UAS sighting in their airspace?

  - ➢ Helicopters operate in airspace that is similar in nature to UAS operations. They often must deal with local laws and governments – the helicopter industry understands and supports federal oversight of the rules

  - ➢ Can technology be used to answer the question? Blackout maps and geo-fencing?

  - ➢ Data gathering by UASS are of great public concern

  - ➢ If necessary, the DAC will need to interface with the proper federal agency in this space, explain our role and concerns and let them take the lead

  - ➢ The DAC should review the output of NTIA as a starter for any work in this area.

➢ Beyond Visual Line of Sight (BVLOS). The DAC discussed the desire to move from Visual Line of Sight (VLOS) to BVLOS. Numerous questions were posed that the DAC felt need to be answers, including:

  ➢ How will BVLOS be prioritized in the NAS?

  ➢ What are the operations going to look like? Segmented airspace? How will efficiency of Passenger and Cargo flights be measured against UASS? There has to be a hierarchy of priorities

  ➢ Can/should we develop a set of operations concept to drive any standards?

  ➢ It was suggested that regulations should be tied to Tiers of risks of applications and operations and the ops concepts should document the level of risk.

  ➢ The communications links required to maintain control of the UAS will have to be encrypted

➢ Several members offered additional direction to the subsequent task groups that will be established to address the top two priorities:

  ➢ Certification and access to the airspace: is there a short list of to-do's (a recipe) that can be put together that make it clear to a potential operator what he/she has to do to gain access without a waiver?

  ➢ Must address how do we (FAA and industry) will pay for it?

    • There should be a list of questions for operators: if they answer YES to all, they can fly

    • Develop minimum standards (performance and more proscriptive as necessary for interoperability) to have UASs interoperate and avoid conflicts

    • Determine how this will scale to bigger aircraft and higher density or more complex airspace

  ➢ Need to be mindful of resources required to address reauthorization-related directions to the FAA and what resources are needed to implement DAC recommendations

• Action Items:

  1. Establish a standing DAC Subcommittee (DACSC) to include a representative from each DAC-member organization and additional members from among those who applied for the DAC as well as other stakeholders and expertise needed for the DACSC to accomplish its mission. Task the DACSC to establish a ranked set of priorities among the remaining drone integration issues the DAC identified at its inaugural meeting

  2. Draft a task statement to define: "What Will it Take to Gaining Access for Drone Operations?" –

  3. **Establish a task group** to develop a minimum set of requirements, a recipe, that operators can follow to gain access to airspace for a specific set of

operations/applications. As a part of this task, the WG should establish a tiered grouping of operations/applications from low to high risk and make a set of recommendations for the lower tiers. We will incorporate all the inputs that we captured from the discussion among the DAC members during the meeting. Note that the FAA plans to provide briefings and educational materials to the TG at its onset to ensure the members are aware of competed and ongoing work relevant to the task.

4. <u>Draft a task statement to define</u>: Pre-Emption and Privacy: Roles and Responsibilities –

5. **Establish a WG** to describe the privacy concerns, and to identify the respective roles and responsibilities for dealing with privacy concerns across local, state, regional and federal entities. Make recommendations regarding pre-emption. Note that the FAA plans to provide briefings and educational materials to the TG at its onset to ensure the members are aware of completed and ongoing work relevant to the task.

- FAA Assistant Administrator of Communications Lisa Jones provided a recap of the key messages, including:

  ➢ The energy around the room today has been very positive. By coming together as the Drone Advisory committee with industry and other stakeholders and the FAA, the DAC can find consensus and speak as one voice.

  ➢ Given the changing nature of public opinion on our integration activities, it is important to get public insights and feedback. Everyone here today has agreed that safety is paramount, but the trust of the public is also important.

  ➢ The Administrator has asked the DAC to begin to develop a To Do list. Although the list is long, it will help us begin to prioritize the next steps.

  ➢ It was clear that this group of individuals are committed to coming together to work through issues and are not reluctant to openly discuss their points of view. We expect to hear different opinions but we know that this group has the energy and commitment to find consensus to help move us forward.

- The Next Meeting is tentatively planned for January 4, 2017 location TBD
  - o Following meetings tentatively planned for June 2017 and October 2017
  - o RTCA will set dates for 2017 DAC meetings within next couple weeks

- Meeting adjourned by the chairman at 4:00 PM

Exhibit 5

Drone Advisory Committee (DAC) Meeting Minutes
January 31, 2017 – University of Nevada at Reno

List of Attachments:

- Attachment 1 – Attendees

- Attachment 2 – FAA Update Slides

- Attachment 3 – Task Group 1 (Roles and Responsibilities) Tasking Statement Presentation Slides

- Attachment 4 – Task Group 2 (Access to Airspace) Tasking Statement Presentation Slides

- Attachment 5 – Written statement from the Honorable Ed Lee, Mayor of San Francisco, CA

- Attachment 6 – Task Group 3 (UAS Funding) Tasking Statement Presentation

- Attachment 7 – FAA DFO Remarks

Opening Remarks:

The second meeting of the DAC was called to order at 9:00 AM on January 31, 2017, in Reno by Chairman Brian Krzanich of Intel, who thanked the FAA for creating the forum. Mr. Krzanich stated that Federal Aviation Administration (FAA) Administrator Michael Huerta was unable to attend and sends his regrets. He thanked FAA leaders Earl Lawrence, Hoot Gibson, Lynn Ray, and others for their support and dedication to this initiative. He also thanked the hosts: Reno Airport Authority (DAC member, Marily Mora) and University of Nevada, and welcomed new DAC member, James Burgess of [X]. He recognized the DAC Subcommittee (DACSC) Co-Chairs Bryan Quigley and Nancy Egan for leading the creation of the Task Groups (TG) 1 and 2 and thanked the leads (Brendan Schulman of DJI and Dr. John Eagerton of the Alabama DoT - TG1; Rob Hughes of Northrop Grumman Corporation and Sean Cassidy of Amazon Prime Air – TG2). He then introduced the TG3 leads (Mark Aitken of AUVSI and Howard Kass of American Airlines). He called for the session to be interactive - asking the members to be active in the conversation.

Designated Federal Official (DFO) Statement

The DFO statement was read by Victoria Wassmer, Acting Deputy Administrator of the FAA at 9:06 AM.

Approval of Minutes

The minutes of the previous meeting were unanimously approved as distributed.

FAA Update

Presenters: Ms. Victoria Wassmer, FAA Acting Deputy Administrator, Mr. Earl Lawrence, Director, Unmanned Aircraft Systems (UAS) Integration Office; Hoot Gibson, Senior Advisor, UAS

- Victoria Wassmer provided opening remarks. Her remarks included an update on FAA and transition activities as well as the FAA budget and reauthorization. She discussed the FAA record of achievement on unmanned aircraft to date and upcoming work on drones, including operations over people. She stressed the importance of the DAC to build consensus around our work and the DAC's opportunity to shape the future of unmanned aircraft in America. She mentioned the work done since the September DAC meeting has provided a framework for future discussions. She then introduced the Task Group working with Roles and Responsibilities, the Task Group working Access to Airspace, and Task Group that will be working Funding.

- Earl Lawrence provided an update on the UAS Integration efforts.

- Mr. Lawrence discussed the management of stakeholder engagement, the Unmanned Aircraft Safety Team education and registration statistics, part 107 webinars, air traffic facility maps and the pending certification basis.

- Mr. Gibson provided a discussion of the UAS ExCom, airport detection, and DAC Meeting objectives as introduced at the first DAC Meeting.

- Victoria Wassmer's remarks and the FAA presentations are attached to this summary.

DACSC Co-Chair Overview of Work and Task Statements

Presenters: Bryan Quigley, DACSC Co-Chair, and Chief Pilot, United Airlines; and Nancy Egan, DACSC Co-Chair, Advisor to CEO, 3D Robotics

Summary

- Mr. Quigley and Ms. Egan introduced themselves and discussed the purpose and scope of the DACSC.

- Co-Chair Quigley introduced the member organizations and the leadership of the DACSC. He explained the accomplishments of the DACSC and summary of the activities of the DACSC. He then explained the DAC starting point and how the TGs were formed from the survey results of the first DAC.

- Co-Chair Quigley asked Mr. Gibson to address "interdiction" and how it maps to the FAA core competencies. Mr. Gibson reported that the FAA is in aviation safety business, not counter

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measures against drones, but and is joining forces with other agencies to address the issue. FAA has a role in identification and tracking of UAS but not necessarily in interdiction.

- Co-Chair Egan explained how risk-based paradigm informed the recommendations to keep the DACSC products relevant and timely. Co-Chair Egan indicated that the DACSC is breaking the work into incremental pieces - they don't want to jump too far ahead or be too far behind. The team is using the evolutionary construct to keep recommendations relevant and timely.

Report out of DACSC TG1 (Roles and Responsibilities)

Presenters: Brendan Shulman, TG1 Co-Chair, and Vice President of Policy & Legal Affairs; John Eagerton, TG1 Co-Chair, and Chief, Aeronautics Bureau Alabama Department of Transportation.

Summary

Brendan Schulman and Dr. John Eagerton provided a brief of the TG1 recommendations

- The Co-Chairs introduced themselves and the members of TG1 and discussed the purpose of the TG.

- Co-Chair Schulman discussed the approach that the TG took to complete its work, including the research they conducted.

- Co-Chair Eagerton discussed the TG1 findings that came out of the research efforts. He also discussed the draft tasking statement deliverable of the TG.

- Co-Chair Schulman and Eagerton alternately provided a summary of the draft task statement recommendations in low altitude UAS navigable airspace; relative roles and responsibilities of Federal, state, local governments; enforcement; education; technological tools and solutions; and local government operational issues.

- Co-Chair Schulman presented the expected activities in the near-term, intermediate-term, long-term, and interim time frames.

Discussion of Recommendations TG1

- Comment: For material to be ready for a May DAC Meeting, material must be ready by the end of March.

  Response: TG1 accepts the challenge to get it all ready by March.

- Question: Co-Chairs asked whether the DAC could meet more frequently than three times a year.

- Response: This is not likely to happen. Dates are set for 2017.

- Question: Is there an opportunity to create a survey for state and local governments to gather input on what they see as their high-priority challenges?

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- Response: This will be put on the agenda for the next TG1 meeting.

- Question: Does a DAC-sponsored poll require approval by the DAC?

- Response: No. RTCA will assist in developing a public poll.

- Question: We don't have a clear understanding of the state and local governments' real concern or interests; their number one concern. We need to prioritize first, then address high priority topics. (e.g., FAA – centralized operations, request for waivers. Who do I need to inform (local police?) to get an operations approved from FAA in Washington, DC? A gap exists between FAA and state and local governments. We want to see more information/data on the priorities state and local governments want us to address.

- Response: Important questions raised – more work is required to answer this. The result of a closer look at these questions and the results of the survey could become a report out at the next DAC meeting.

- Question: There is concern with the volume of current and potential legislation for UAS - what will prevent the legislation from morphing into laws that affect manned aircraft? What is the FAA's view of this situation where municipalities are creating rules that affect navigable airspace?

- Response (from FAA) - Many good questions are being raised. We have a system that works today.

- Comment: Recommendations can be written to apply only to unmanned aircraft. No presupposition of changes in roles, but the recommendations should be written to only apply to unmanned vehicles.

- Response: The FAA has issued a legal fact sheet that provides regional contacts when questions arise. FAA will make that fact sheet available to RTCA to post on the DAC and DACSC Workspace website.

- Comment: A member expressed the need to define a set of high level tenets to which all on the DAC could agree and that could serve as guidance to the work of the TGs. For example, there is a need to look at impact of UAS in the airspace, and ask if there is an overall net positive. For example, a car driving to pick up or deliver a package is louder than a drone. Drones that inspect roofs are safer than a person climbing on one. Can you identify these tradeoffs? A list of tenets would enable us to address some ethical questions.

- Response: It was agreed that the DACSC would develop a set of tenets to bring back to the next DAC meeting. Gur Kimchi of Amazon Prime Air, will develop an initial set as input to this process. Others on the DAC agreed to provide inputs as well.

- Question: One of the recommendations was for a public statement - Is a motion required for that to take place?

- Response: Yes. We will have a discussion of the content of that potential message as part of "other business" later in the agenda.

- It was mentioned that the FAA had already released a public statement about the DAC. It was requested that RTCA make that statement available to the DAC members.

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- **ACTION**: Make the FAA press release available to the DAC members – RTCA to post that today.

- Question: The issues of counter-measures were not mentioned in the slides - why?

- Response (from FAA): Review of the Task Statement (page 7) *Counter measures and other Active Responses.* The FAA does not want this issue addressed by the DAC. The FAA is working with other agencies to determine the most appropriate way forward, including how to engage industry. Mr. Gibson indicated that counter-UAS includes all spectrums of risk: 1) detection, 2) tracking, 3) identification, and 4) mitigation (kinetic or non-kinetic) and he reiterated that the FAA is not involved in interdiction. Going forward, the FAA will provide updates to the DAC from the ExCom.

- **ACTION**: It was agreed that the reference to counter-UAS should be deleted from the draft tasking statement for TG1.

- Question (audience member): How will the DAC handle risk?

- Response: The FAA indicated that for counter-UAS there is a full spectrum of risk from detection, to tracking, identification and mitigation (kinetic and non-kinetic). The FAA will not address the mitigation aspects.

- **CONSENSUS**: The Chairman asked for a motion to approve the tasking statement with the language deleted (and other caveats). The motioned carried. RTCA will include the modified tasking statement in a formal response to the FAA from this meeting.

- A statement from Mayor Lee from San Francisco was read by the director of San Francisco Airport. The statement encouraged input from local governments in structuring an Unmanned Traffic Management System. The statement is attached.

Report out of DACSC TG2 (Access to Airspace)

Presenter: Rob Hughes, Co-Chair, TG2, and Senior Policy Advisor, Office of Independent Airworthiness, Northrop Grumman Aerospace Systems

Co-Chair Hughes presented the purpose of the TG, a listing of the member organizations, the approach that was taken in development of the material presented, a high-level calendar of deliverables and resources (Co-Chair Sean Cassidy, Amazon Prime Air, was unable to attend the meeting). The presentation is attached.

Co-Chair Hughes discussed the areas of recommendations the TG will provide, which include: 1) Roles and responsibilities, 2) Expedited UAS airworthiness and operations approvals for near-term (within 24 months) UAS missions, 3) Expedited minimum essential aircraft equipage, 4) Public/private infrastructure needs and operational requirements beyond those currently permitted under 14 CFR parts 101/107 to include information flow and interoperability considerations, and 5) Use of spectrum for command and non-payload communications.

Discussion of Recommendations TG2

- Question: Is the TG ready to achieve a very aggressive schedule to deliver by the end of March?

- Response: Yes.

- Question: How is the TG going to work out the integration of small/large at the same time?

- Response: The FAA has a roadmap of integration based on a functional approach. FAA does not look at altitude to decide rules. It is the function (and associated risk) of the vehicle that drives level of oversight for certification.

- Question: With regards to levels of service, is there an effort to allow early wins using a risk-based approach that will allow predicted levels of safety to be validated?

- Question: Can the timescale be shortened?

- Question: How does scalability work when introducing it into the real-world, and can small unmanned aerial vehicle (UAV) rules be scaled to the larger UAVs? The 24 month timeframe was picked to allow that analysis.

- Response: FAA is not slowing the authorization of operations (BNSF, CNN, etc.) to accommodate the DAC.

- Question: What data can BNSF provide to make your job easier?

- Response: The Co-Chairs indicated that they could not currently answer this question. Work needs to be done to: 1) determine how to reach-out to industry, 2) identify and resolves issues with data collection and analysis, and 3) determine whether we can use collected data for to predict issues.

- Question from the Chairman: Do you have the right members on your team?

- Response: Yes, but there is always room for more subject matter experts and observers, and we will reach out for them as needed.

- Response from FAA: The FAA set up three webinars to educate the members on Pathfinder Programs, and we plan to do more.

- Comment: The slides say expedited processes (24 months), but near-term should be shorter than 24 months. Are waivers only granted for companies that have Pathfinder programs? If Pathfinders are needed to get a waiver, we need to be clear about that. The minimum-viable products process could be dramatically improved by the FAA. The waiver process needs improvement and that could and should be done in the near-term, meaning 3 or 6 months.

- Question: Is there a thought to have a communication plan from TG2?

- Response: That's a question left up to the DAC.

- Question: Is there a commitment to get a piece of spectrum allocated to the UAS?

- Response: International Telecommunications Union (ITU) decided this already. Is there other spectrum available that can be used?

- Question: Can other spectrum be repurposed? Is TG2 looking broadly at this issue?

- Response: The TG is narrowly focused.

- Response from the Chairman: The DAC would like shorter term wins - less than 6 or 12 months.

- Comment: Alternative spectrum discussion should be incorporated (performance and robustness requirements).

- Comment: If spectrum is added by default, it will limit autonomous operations in the future.

- Question: What are the communication requirements and methods needed to accomplish this?

- Comment: This spectrum could be a foundational piece that allows the progression from initial to full integration. It can be considered an enabler. We should refer to it as the broader term, communication, so we do not limit flexibility of solutions.

- Comment: Electromagnetic spectrum is a resource that is stressed; National Telecommunications and Information Administration process should be included.

- Comment: Spectrum issues already decided at the 2012 and 2015 World Radio-Communications Conference. We might need to look at how to repurpose spectrum.

- **ACTION**: Change "use of spectrum" to "methods of communications" in item 4 of the tasking statement.

- Question from the Chairman: How do we find early wins for quick adoption?

- **ACTION**: Change "aircraft" to "UAS" in item 1.

- **CONSENSUS**: The Chairman asked for a motion to approve the tasking statement with the language modified (and other caveats). The motioned carried. RTCA will include the revised tasking statement in a formal response to FAA from this meeting.

Presentation of DACSC TG3 Task Statement (Funding)
Presented: Nan Shellabarger, Executive Director of FAA Policy and Plans

Ms. Shellabarger presented the draft TG3 Tasking Statement. Ms. Shellabarger explained that this is a more traditional way of providing tasking to a Federal advisory committee like the DAC. After receiving DAC feedback on the draft TG3 Tasking Statement, the FAA will finalize and approve the tasking statement and forward it to the DAC to execute. Ms. Shellabarger then explained the task details, the FAA funding structure, and offered the DAC items to think about before discussing the tasking statement. She highlighted the questions that will be asked of TG3:

- How much, for what, in what time frame?

- Who should pay for what?

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- What kinds of mechanisms can be implemented?

- Do these set up incentives, or create unintended consequences?

- Can we reach consensus?

Task Refinement and Discussion

- Question: How do we establish funding so the FAA's UAS work does not impact certification and oversight of manned aviation?

- Comment: One member warned that the term "user fees" will result in resistance from some and should be avoided.

- Response: Ms. Shellabarger explained that the government has definitions of "taxes" and "fees". Fees are levied on a specific set of users who will receive a benefit. Taxes require legislation. Typically, the FAA's annual appropriation bill carries a prohibition on new user fees.

- Question: What part of the FAA's overhead is getting "costed" to the UAS effort. It would be helpful to see that. How do we amortize development costs over time (e.g. with NextGen), and how can we learn from those models in this space?

- Response: Government does not do accrual accounting - planning for this is being laid out for future years. FAA does not have an approved 2017 budget and is currently operating on 2016 budget. The FAA is preparing now for 2018 and 2019, but government disruptions, such as sequestration, can impact the FAA's budget and programs.

- Question: Should a tenet be that the FAA should allow industry to build as much as possible of the new capabilities, such as Unmanned Traffic Management? The FAA does not have to do everything. We can federate.

- Comment: How funding was done in the past may not be applicable to how it is done in the future.

- Comment: We need to establish a logical model of what the FAA should fund and how.

- Comment: The government does not run internet or cell networks; industry should figure this out. There is much that industry can do that FAA does not have to own.

- Comment: It might be hard for this industry to do because the industry is figuring it out too. They must do this holistically and not just concentrate on commercial drones. Consumer drones are being used for commercial purposes. We should avoid segmentation of the industry.

- Question: Can the FAA shed more light on the schedule of the task, and when they need responses from the DAC?

- Response: The FAA wants information to inform the debate on any discussion on FAA funding and structure.

- Question: Are we relying on FAA to implement these, or industry stakeholders as well?

- Question from the Chairman: Can this be broken into a couple of pieces? Is the real scope that, we need a system that gets funded using a mechanism that this industry will support, and you want TG3 to assist in defining that? If so, the description needs to be made simpler for the TG to work.

- Question: Why would the budget for drones be even close to the one for NextGen? Can't industry do some of this?

- Response from Ms. Shellabarger: This is why we posed the first question the way we did. It takes a lot of FAA resources to implement rules (e.g. part 107). Even UTM must integrate with, and talk to, FAA systems. That costs money.

- Question: Are you looking to define a 5th fund separate from the others?

- Response: It will be integrated into the existing structure.

- Question: Do we know what the costs are fundamentally? The cost for NextGen was much better defined, and there is much to be learned from these past efforts. Do we even have a handle on what the costs are going to be? Isn't that the question we should be asking?

- Response: We need to know the system to be implemented as well as the costs. It may be too much to ask at this point.

- Comment: This group may be "out of its element" in answering this task. There is a level of work that must be done before we take this on. A Member countered that the timeline is crucial to influencing upcoming FAA reauthorization, and needs to be discussed in this forum. Congress is already talking about new entrants, and the DAC is here and the best forum to weigh in.

- Question: Why does FAA need our input by May?

- Response: A timeline is crucial for upcoming legislation. This work will inform the FAA authorization in September 2017. We are not looking for specific amounts of funding needed by May, but rather what kinds of things to work on and what is not worth working on.

- Comment: The DAC needs to understand what it actually costs the FAA to do a proper job of this tasking.

- Comment: One member pointed out that we know how the airlines pay for services.

- Comment: This is coming one way or the other. If this body wants input in shaping it, we should start looking at the issue.

- Comment: We need to get started on it because the reauthorization cycle is coming. We should be cautious about burdening the user. We need to know how much needs to be raised and how much can be raised with commercial operators.

- Comment: There are unknowns, but there are many resources on the committee and we should at least try to answer the FAA. The FAA can be used to gather information. The timeframe is a concern; the May meeting may be too early - perhaps put in another meeting between May and October and dedicate it to this issue.

- **ACTION**: Virtual meeting on just this topic is allowed. RTCA will plan that.

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- Comment from the Chairman: The Chairman summarized that the DAC needs to look at what it costs, and look at sources for funding. We should look at what industry could take over to unburden the FAA. This might be a separate TG, to make the task of TG3 simpler. Specifically, the Chairman summarized the following:

  1. 24-month timeframe: 1) what resources are needed? 2) what can industry do instead of the FAA? and 3) what fees would be needed to get that money? (only for the next 24 months);

  2. Schedule a virtual meeting in August, only on this topic;

  3. Have TG3 finish points 1 and 2, and start to work on structuring; this not burdened by the current methods; and

  4. Work with the FAA to make modifications to the TG3 tasking statement.

- The DAC approved the DACSC to go through the process of creating TG3.

- Action: Add SC-228 briefing to the DAC agenda for May (obtain related materials presented to Subcommittee and then post on the DAC Workspace website).

Public Statement Discussion

The Chairman led a discussion on whether the DAC should issue its own press release regarding the work on roles and responsibilities of TG1, to inform state and local entities that this work is going on to slow the pace of local legislation regarding drones. The DAC discussed alternative approaches to communications including: 1) an FAA public statement, 2) an RTCA public statement, 3) posting on the RTCA website, or 4) TG1 to issue a public statement. A member asked other members if they would support a DAC-originated public statement. FAA statements must go through a time-consuming vetting process. The DAC could release a consensus statement, but needs to be clear that it is an advisory committee and it is up to the FAA how it acts on the DAC's advice.

CONSENSUS: After the discussion, the Chairman summarized the following:

- The DAC will not issue its own public statement;

- The FAA should publish statements (e.g., press releases or "News and Updates");

- Per its normal process of operating as a Federal advisory committee, RTCA will post summaries of the DAC meetings on its website;

- DAC members can spread the FAA press releases or "News and Updates" amongst their respective communities; and

- National Association of Counties will ensure anything that was discussed at the DAC meeting will be forwarded to the communities.

New Business

No new business introduced.

Date for Next Meeting

- The next (fourth) meeting of the DAC will be in Washington, DC on May 3, 2017, followed by a fifth DAC meeting on November 8, 2017, location TBD.

- The DAC will add a virtual meeting July 21st to discuss TG3 interim recommendations.

Action Items:

Action	Responsible Party	Schedule	Status
RTCA will assist in developing a public poll to assist TG1 in determining the State and Local government concerns and priorities	RTCA		
Post the FAA legal fact sheet that provides regional contacts	RTCA		Complete
Post the FAA press release to DAC members	RTCA		Complete
Remove references to Counter-UAS from TG1 tasking	RCTA		Complete
Develop set of basic tenets with input from Gur Kimchi, Amazon Prime Air	DACSC	May DAC	
Change "use of spectrum" to "methods of communications" in Item 4 of TG2 recommendations	RTCA		Complete
Change the word "aircraft" to "UAS" in item 1 of TG2 recommendations	RTCA		Complete
TG3 – work for this TG will include short-term and longer-term work; near term work would include determining the timeframe and determine resources that are needed, what industry can do instead of the FAA, and what fees would be needed to get that funding	TG3		
RTCA schedule virtual meeting in July only on the topic of TG3	RTCA		
FAA to make modifications to TG3 and send to RTCA to share with DAC	FAA	Week of Feb 6	
Once RTCA has received tasking letter from FAA, develop and send ballot to DACSC to	RTCA	Week of Feb 6	

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Action	Responsible Party	Schedule	Status
solicit interest in serving on TG3; Begin the process selecting TG3 after the poll closes			
Add SC-228 briefing to DAC on the agenda for May (get materials presented to Subcommittee onto DAC workspace)	RTCA		Complete
DAC direction on public statements is that FAA should publish; RTCA will post to the RTCA website; DAC members can spread the release amongst the communities	All		RTCA posted high-level summary on website - 2/4/17

Adjournment:

In closing remarks, Ms. Wassmer, FAA DFO, thanked the University of Nevada, the Reno Airport Authority, and Ms. Mora for hosting the event. She thanked the members for their time and involvement in the meeting. She summarized the meeting events surrounding the Task Group 1 approval of the tasking statement and Task Group 2 task statement. She noted the work associated with creating the Task Group 3 task statement and thanked the committee for their deliberations. She continued that this was her first trip to Reno, and the natural beauty and the welcome the DAC received made everyone feel like honored guests, which contributed to the success of the meeting.

Chairman Krzanich echoed those sentiments and at 3:30 PM, adjourned the meeting. The next general meeting will be at 9:00 AM on May 3rd, 2017 in Washington, DC.

Minutes submitted by - Al Secen
Vice President Aviation Technology and Standards
Secretary of the Drone Advisory Committee

Exhibit 6

TERMS OF REFERENCE

Drone Advisory Committee Subcommittee (DACSC)

Subcommittee Leadership:

Position	Name	Organization	Telephone	Email
Co-Chair	Nancy Eagan	3D Robotics	(408) 628-3593	nancy@3drobotics.com
Co-Chair	Bryan Quigley	United	(571) 606-1723	bryan.quigley@united.com
Secretary	Al Secen	RTCA	(202) 330-0647	asecen@rtca.org

Background

Unmanned Aircraft Systems (UAS) offer the United States the opportunity to lead a completely new and expanded vision of aviation. The FAA seeks to establish a venue and process to enable stakeholders to advise the FAA on the needs of these new and expanding users of the National Airspace System (NAS) while identifying the strategic regulatory priorities and structure that simultaneously promote innovation, safety, efficiency and rapid integration of UAS into the NAS.

The best mechanism to leverage all the resources, expertise and energy to achieve the FAA and industry's goals of safe and timely integration of all categories of UAS into the airspace, is through an open, transparent venue of a federal advisory committee (FAC). As with all FACs, the Drone Advisory Committee (DAC) will be designed to: ensure transparency, include broad and balanced representation across the industry, encourage innovation and remain consistent with US anti-trust laws.

The DAC Subcommittee (DACSC) will support the DAC in carrying out its task as defined in this Terms of Reference.

Purpose and Scope

The purpose of establishing a subcommittee of the DAC is to support the DAC in developing consensus-based recommendations to the FAA on issues related to the integration of UAS into the nation's airspace. The DACSC will be representative of the DAC membership (defined below) along with any other expertise that is deemed necessary to carry out its tasks.
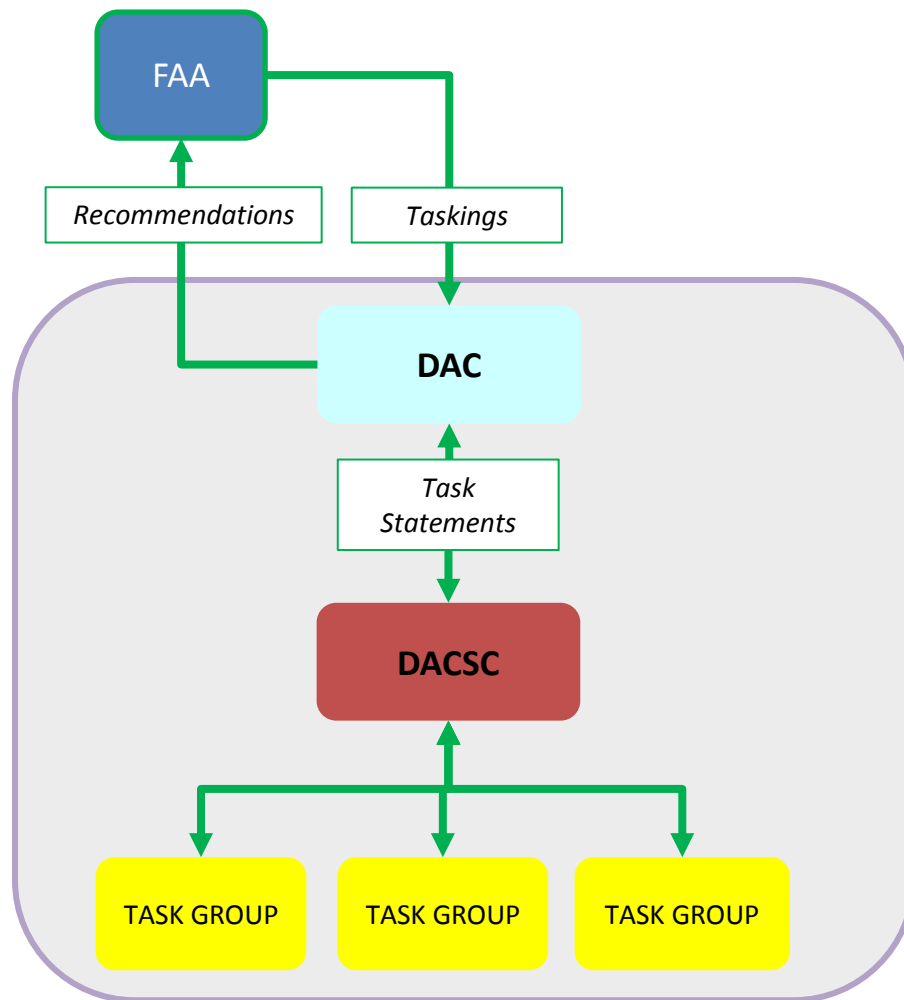
Specifically, the DACSC supports the DAC by providing a group of experts on UAS operations, applications, regulations, certification, performance, technical standards, and NAS operations, as well as the perspective of those affected by UAS operations. In essence, the DACSC will provide the staff work for the DAC, applying knowledge and expertise to forge consensus on critical issues and providing input to the DAC for public deliberation and the development of recommendations to be forwarded to the FAA.

The DACSC will provide guidance and oversight for the Task Groups (TGs), which will be shorter-lived groups established to forge consensus-based recommendations in response to specific taskings handed down from the DAC and disbanded upon completion of their work.

Committee Structure

The DACSC will report to the DAC and will provide guidance and oversight to the DAC Task Groups.

Figure 1: DAC Committee Structure and Work Flow

Responsibilities

- **Drone Advisory Committee (DAC)**

  - Overall direction of Committee
  - Develop, review, and approve recommendations to FAA
  - Field requests from FAA
  - Review and approve creation of Task Groups, as appropriate
  - Meet three times per year in Plenary (open to public)
  - Direct tasking of DACSC

- **DAC Subcommittee (DACSC)**

  - Staff to DAC
  - Guide and review selected work of Task Groups, develop draft recommendations, and present findings to DAC
  - Meet bi-monthly or as needed (generally not open to public)
  - Forward recommendations and other deliverables to DAC for consideration

- **Task Groups**
  - Created to address specific taskings at the direction of the DACSC
  - Should be of specified duration
  - Forward recommendations and other deliverables to DACSC

Operating Guidelines

The DACSC will address issues as directed by the DAC. If in the conduct of their work, the DACSC feels it would be beneficial to provide advice to the FAA on other topics, they may request that the DAC task them to develop those recommendations and bring them to the DAC. DACSC meetings are not open to the public. No recommendations will flow directly from the DACSC or DAC TGs directly to the FAA. All must be vetted in a public DAC meeting and transmitted to the FAA upon approval by the DAC.

DACSC Representation

The DACSC membership will represent the following stakeholders:
- Appropriate expertise as reflected in the following areas of interest:
  - UAS Manufacturers (all sizes)
  - UAS Operators (all sizes)
  - Drone Hardware Component Manufacturers
  - Drone Software Application Manufacturers
  - Traditional Manned Aviation Operators
  - Airports and Airport Communities
  - Labor (controllers, pilots)
  - R&D, Academia
  - Local Government

- ➢ Navigation, Communication and Surveillance and Air Traffic Management Capabilities Providers
- ➢ Legal
- ➢ Other specific areas of interest as determined by the DAC Designated Federal Official (DFO)

Other stakeholders may be added later if appropriate. Approval for these additional stakeholders will be by the DACSC Co-chairs in consultation with the RTCA President and approval by the DAC Chairman and DAC DFO. Non-voting members selected by the DFO, who may attend as observers and have access to the committee's online workspace managed by RTCA, will include:
- ➢ Other Federal Agency personnel
- ➢ Representatives from the UAS ExCom
- ➢ Other FAA personnel

DACSC Membership

The DACSC will utilize a combination of one-year and two-year terms for the initial appointments. Membership can be renewed.

Members: As with the DAC itself, members of the DACSC must be able to speak for and commit their organizations to the consensus of the committee, and have working knowledge and expertise of the FAA, UAS-related programs, technologies and operations. Members have full voting rights (see exceptions below). Members are expected to be present at all meetings. Their designated Alternate may attend no more than twice per year. Co-chairs will review committee structure annually and take committee participation into account for ongoing membership.

Alternates: One designated Alternate for a Member may be identified by submitting a single person for approval by the DACSC co-chairs in consultation with the RTCA President, to serve the same term as the member. Like a Member, an Alternate is selected based on his/her knowledge, experience, position in their company and ability to speak for and commit their organization to the consensus of the group. A designated Alternate may attend in place of a DACSC Member, but not more than twice per year.

Non-voting Members: FAA and other Federal Agency personnel. They will take part in the DACSC's deliberations and provide input to final products; however, they do not represent affected user groups in reaching consensus.

All participants on the DACSC, regardless of position, are expected to keep their organization's representative on the DAC (if applicable) informed of the DACSC work.

Task Groups

Task Groups will be established as outlined below. Task Group products—including recommendations, where appropriate—are presented to the DACSC for review and deliberation, and if so directed by the DACSC, presented to the DAC for consideration at its public meetings. Members of Task Groups will be appointed by the DACSC Co-chairs in consultation with the RTCA President and approval by the DAC Chairman and DAC DFO. Task Group meetings are not open to the public.

Unlike the DAC and the DACSC, members of the Task Groups do not represent a particular affected entity and are selected for their expertise in the subject matter rather than their affiliation. Task Group's develop draft recommendations for consideration by the DACSC. Task Groups work from a Task Assignment Document developed by the DACSC in response to a request from the FAA.

DACSC Meetings

The DACSC will meet bi-monthly or as needed. Because the DACSC and its associated Task Groups are not Federal advisory committees, its meetings are not required to be open to the public; nor can the DACSC make recommendations directly to the FAA. While not required, some meetings of the DACSC may be open to the public to provide an early opportunity to identify potential concerns associated with draft recommendations. Such determination to make DACSC meetings open to the public will be made by the DAC Chair and the DAC DFO.

Specific Tasks and Deliverables

The DACSC will deliver its consensus output to the DAC at least fifteen (15) days in advance for deliberation in meetings open to the public. It is expected that the DACSC will utilize Task Groups to develop products and bring them to the DACSC for consensus. These are further defined in the Task Groups' Task Assignment Document.

Exhibit 7

U.S. Department
of Transportation

**Federal Aviation
Administration**

Office of the Deputy Administrator

800 Independence Ave., S.W.
Washington, D.C. 20591

**Drone Advisory Committee (DAC) – Task Group (TG) 1
Recommended Tasking on Roles and Responsibilities
January 31, 2017**

ACTION: Topics for discussion and analysis for DAC Subcommittee (DACSC) TG on governing roles and responsibilities.

SUMMARY: The Federal Aviation Administration (FAA) is presenting to the DACSC topics for discussion and analysis regarding whether the rapid advent of Unmanned Aircraft Systems (UAS) (or "drones") warrants consideration of the relative roles and responsibilities of the Federal and of state/local governments for regulating certain UAS operations in low-altitude airspace as compared to the Federal government's exclusive role and responsibility for regulating all aspects of manned aircraft operations.

Since 1926, when the United States declared exclusive Federal sovereignty of the airspace (as supplemented by aviation statutes in 1938 and 1958), a statutory and regulatory framework vests in the Federal Government exclusive authority for regulating all aspects of manned aviation, whether fixed wing aircraft or rotorcraft/helicopters. With the exception of takeoff and landing, most manned aircraft operations are conducted at "minimum safe altitudes," which generally have not been defined to include low-altitude airspace. However, the rapid development and increasing use of UAS in low-altitude navigable airspace and their unique operating characteristics (*e.g.*, can be launched anywhere, typically fly at low altitudes, ease of use) raises important regulatory policy questions as to the role of state and local governments relative to the role of the Federal Government.

Currently, existing statutory and regulatory rules do not permit state and local governments directly or indirectly to regulate aircraft flight operations, aviation safety or efficient use of navigable airspace. They do have the authority through their police powers to promulgate and enforce rules of general applicability; however, increasingly state and local governments desire to exercise more direct authority over UAS operations in low-altitude navigable airspace to accommodate a broad array of sometimes competing national and community interests.

BACKGROUND: In response to the proliferation of UAS, many state and local governments have begun to enact a variety of laws regulating UAS operations in low-altitude navigable airspace. Virginia, Arizona, Delaware, Rhode Island, Michigan, Oregon, and Maryland prohibit local government regulation of UAS, instead vesting sole authority in the state legislature. Other states, such as Tennessee, California, Nevada, and Minnesota, declare state sovereignty of the airspace unless granted to the Federal Government pursuant to a constitutional grant from the people of the state. T.C.A. § 42-1-102; Ann.Cal.Pub.Util. Code § 21401; N.R.S. 494.030; M.S.A. § 360.012.

Still other state and local governments enacted legislation regulating the time, place, manner and/or purpose for which private parties may use UAS in their jurisdictions. Specific examples of enacted or proposed legislation include:

- Minimum altitude rules;
- Geo-fencing technology;
- Overflight without property owner's permission;
- Curfews/designated hours of flight;
- Restricted flight over critical infrastructure, public assemblages, and first responder activity;
- Reckless interference with an aircraft;
- Restricted use from public property;
- Accident or incident reporting;
- Registration;
- Advance notice of flight;
- Insurance requirements;
- Voyeurism or capturing an image without consent; and
- Civil and/or criminal enforcement mechanisms

Notwithstanding the enactment of such legislation, since the Air Commerce Act of 1926, Federal law has provided the United States Government exclusive sovereignty of airspace of the United States and that citizens have a public right of transit through the same. By statute, the FAA has exclusive authority to regulate:

- Safety;
- Efficient use of the airspace;
- Protection of people and property on the ground;
- Air traffic control; navigational facilities; and
- Aircraft noise at its source.

49 U.S.C. §§ 40103, 44502, and 44701-44735. To implement that authority, Congress has directed the FAA to:

- Develop plans and policy for the use of the navigable airspace and assign by regulation or order the use of the airspace necessary to ensure the safety of aircraft and the efficient use of airspace." 49 U.S.C. § 40103(b)(1); and
- Prescribe air traffic regulations on the flight of aircraft (including regulations on safe altitudes)" for navigating, protecting, and identifying aircraft; protecting individuals and property on the ground; using the navigable airspace efficiently; and preventing collision between aircraft, between aircraft and land or water vehicles, and between aircraft and airborne objects. 49 U.S.C. § 40103(b)(2).

In furtherance of these statutory commands, the FAA has established a comprehensive regulatory scheme, governing, among other things, the registration and certification of aircraft; certification of airports, pilots and mechanics; aircraft equipage; air traffic control systems; aviation navigation and communication; airspace classifications as well as minimum safe altitudes,

cruising altitudes or flight levels, minimum altitudes for instrument flight rules operations, and specific flight altitude rules for large and turbine-powered multiengine airplanes.

Because FAA regulation occupies the entire field of aviation safety, management and efficient use of airspace, air traffic control, and flight management, state and local regulation is impermissible. As noted by the U.S. Supreme Court, the FAA's primary statute, the Federal Aviation Act of 1958 (now codified at 49 U.S.C. §§ 40101, et seq.):

> [R]equires a delicate balance between safety and efficiency, and the protection of persons on the ground ... The interdependence of these factors requires a uniform and exclusive system of federal regulation if the congressional objectives underlying the Federal Aviation Act are to be fulfilled.

Burbank v. Lockheed Air Terminal Inc., 411 U.S. 624, 638-639 (1973).

Indeed, the Supreme Court has ruled that even complimentary state regulation parallel to federal regulation is impermissible: "Where Congress occupies an entire field . . . even complimentary state regulation is impermissible. Field preemption reflects a congressional decision to foreclose any state regulation in the area, even if it is parallel to federal standards." *Arizona v. U.S.*, 567 U.S. ___, 132 S.Ct. 2492, 2502 (2012).

A consistent regulatory system for aviation and use of airspace ensures the highest level of safety for all aviation operations, including the operation or flight of aircraft. Without exclusive Federal regulation, "[t]he likelihood of multiple, inconsistent rules would be a dagger pointed at the heart of commerce – and the rule applied might come literally to depend on which way the wind was blowing." *British Airways Board v. Port Authority of New York and New Jersey*, 558 F.2d 75, 83 (2d Cir. 1977), *aff'd, as modified*, 564 F.2d 1002 (2d Cir. 1977) (referring specifically to aircraft noise control).

Noise-related cases seem particularly relevant because most local noise ordinances necessarily implicate the FAA's authority over flight operations and paths. For example, in *Allegheny Airlines v. Village of Cedarhurst*, 238 F.2d 812 (2d Cir. 1958), the court invalidated an ordinance which prohibited aircraft flights over the village at altitudes of less than 1,000 feet); and in *American Airlines v. Town of Hempstead*, 398 F.2d 369 (2d Cir. 1968), *cert. denied* 393 U.S. 1017 (1969), the Court invalidated a noise ordinance that prohibited overflights of a town by aircraft that did not meet certain noise standards because compliance would have required the alteration of FAA-promulgated flight patterns and procedures.

Nevertheless, in crafting their recent legislation, some state and local governments no doubt have been cognizant of the United States Supreme Court's 1946 decision in *United States v. Causby*, 328 U.S. 256, 264 (1946), holding that property owners have limited airspace rights as an incident to ownership of the land. The court declared:

> [I]f the landowner is to have full enjoyment of the land, he must have exclusive control of the immediate reaches of the enveloping atmosphere .... [A]s we have said, the flight of airplanes, which skim the surface but do not touch it, is as much an appropriation of the use of the land as a more conventional entry upon it.

In the context of repeated and regular overflights of government-owned aircraft, the court held that a flight glide path passing over property at 83 feet, which was 67 feet above the house, 63 feet above the barn, and 18 feet above the highest tree constituted an unlawful taking of an air easement for which the landowner was entitled to compensation.

In 1962, the Supreme Court affirmed that "the use of land presupposes the use of some of the airspace above it. Otherwise no home could be built, no tree planted, no fence constructed, no chimney erected. An invasion of the 'superadjacent airspace' will often 'affect the use of the surface of the land itself.'" *Griggs v. Allegheny County*, 369 U.S. 84 (1962). The court held that flight patterns between 30 feet to 300 feet over the landowner's residence constituted an unlawful taking of an air easement.

Indeed, the teaching of *Causby* and *Griggs* may well be reflected in those state statues that make unlawful the flight of aircraft over lands and waters of the state where (1) it is at a low altitude that interferes with the existing use to which land, water or space over the land or water is put by the owner, or (2) it is conducted in a manner that is imminently dangerous to persons or property lawfully on the land or water beneath the flight. A.R.S. § 28-8277; N.C.G.S.A. § 63-13; A.C.A. § 27-116-102; MD Code § 5-1001; I.C. § 21-204. See also, *Brenner v. New Richmond Regional Airport Commission*, 343 Wis.2d 320 (2012); *Schronk v. Gilliam*, 380 S.W.2d 743 (Ct. Civ. App. Tex. 1964).

Drones are an increasingly important part of many businesses with significant potential to dramatically change many different industries. Drones currently are used for many applications and jobs such as inspection of critical infrastructure, aerial surveillance, cinematography, security, inspection, and package delivery. Whether in classroom settings or less formal sporting activities, they are also becoming established as a tool to educate and excite young people about topics in science, robotics, technology and aeronautics, potentially inspiring new generations to pursue careers in important industries including aviation. The characteristics of unmanned aircraft, what makes them particularly serviceable for many of the applications for which they are used today, are the same characteristics that raise the question of the appropriate role of state and local governments in regulating where and when unmanned aircraft should be permitted to fly. Again, drones can be relatively small, easy to fly, take off or land nearly anywhere, are capable of flying at very low altitudes, and can access many locations inaccessible to manned aircraft.

TASK: The FAA suggests the TG evaluate and analyze state or local government interests identified in this document, and other state or local interests identified by the TG. This analysis could form the basis for recommendations to the DAC reflecting a consensus view that could be used to inform future agency action related to the relative role of state and local governments in regulating aspects of low-altitude UAS operations.

Fact Finding and Analysis

The TG could review and evaluate the following concerning state and local regulatory responses to UAS operations, including the enforcement of applicable rules and regulations:

<u>State and Local Interest in, and Responses to, UAS</u>

- Identify the specific state/local governmental interest being vindicated in their legislative responses; Assess the strength of such interest and its impact on the FAA's core roles and responsibilities;
- Assess the likely impact of state/local governmental response on civil use and access to airspace, interstate commerce, technological innovation and commercialization of such innovation, and the role of partnerships; and
- Identify possible alternative legislative responses to achieve desired state/local governmental interest.

<u>Enforcement of Federal Safety and Airspace Rules and Regulations</u>

- Relative role and responsibility of state and local governments for responding to, investigating non-compliance with and enforcing state and federal UAS-related rules and regulations;
- Whether state and local governments should be encouraged to develop parallel or complimentary enforcement mechanisms;
- Efficacy of existing parallel/complimentary enforcement mechanisms; and
- Efficacy of alternative federal/state enforcement schemes applicable to other Federal transport modes.

Develop Recommendations

The TG could develop recommendations as to:

<u>Defining Low-Altitude UAS Navigable Airspace Susceptible to State/Local Governmental Interests</u>

- The extent to which a definition of "low-altitude airspace" (perhaps as a type of boundary line) in the context of UAS operation is susceptible to allocation, or cooperative, concurrent, or delegated jurisdiction among State and local governmental interests.
- Is there a non-federal interest in operations of UAS in airspace that is other than "low-altitude airspace"?
- Is there analog to "minimum safe altitude" for UAS?
- Consider the contemporary relevance of traditional authorities such as the American Law Institute's Restatement of Torts, Second, 159(2), which summarizes the general principle of *Causby* and *Griggs* as follows:

  ➢ Flight at 500 feet or more above the surface is not within the "immediate reaches,"
  ➢ Flight within 50 feet, which interferes with actual use, clearly is, and
  ➢ Flight within 150 feet, which also so interferes, may present a question of fact.

Relative Roles and Responsibilities of the Federal, State and Local Governments

- Whether the existing framework of Federal exclusivity for regulation of low-altitude UAS operations should be reconsidered in light of state and local governmental interests identified by the TG;
- If so, what modifications would better integrate important state and local governmental interests with important Federal interests in ensuring safety as well as efficient management of and access to airspace;
- Roles and responsibilities for interests other than aviation safety; and
- What oversight or regulatory mechanisms are appropriate to vindicate Federal interests in ensuring safety of UAS operations as well as efficient management and access to low-altitude navigable airspace?

Enforcement

- Whether to change the relative role and responsibility of state and local governments for enforcement of any aspects of rules and regulations governing low-altitude UAS operations;
- If so, what changes should be made;
- What specific mechanisms would achieve the recommended change; and
- Whether additional data collection is necessary for Federal/state enforcement and/or to inform future agency policy and rulemaking. Any data obtained would also assist in FAA's mandate to safely and efficiently integrate UAS into the National Airspace System (NAS).

Education

- What training and education is needed if local authorities or officials are asked to assist with, implement, or otherwise address federal statutes and regulations?
- Who should conduct that training? How can consistency of enforcement and implementation be achieved across jurisdictions?
- What funding might be needed by non-FAA enforcement agencies and adjudicative bodies?

Technological tools and solutions

- Are there existing or future technologies that may be utilized in connection with the roles and responsibilities of government?
- What tools are on the horizon that may address governing concerns and interests? How might they be effectively implemented?

Local Governmental Operational Issues
- How can government facilitate the use of UAS, during emergency response efforts and other government operations, including issuance of approvals, and prohibit UAS interference with manned aircraft?

- Recommendations on how FAA should respond to the emerging state and local regulations in this space. What are the roles of the FAA and state or local government in authorizing operations in emergency situations?

SCHEDULE: The FAA requests an interim set of recommendations at the May 2017 DAC Meeting, followed by a final report no later than the October 2017 DAC Meeting. The FAA will make subject matter expertise available to the DAC upon request.

FOR FURTHER INFORMATION CONTACT: Victoria Wassmer, Acting Deputy Administrator (ADA-1) and DAC Designated Federal Official, at 202-267-8111.

Issued in Washington, DC, on February 10, 2017.

Victoria B. Wassmer
Deputy Administrator (A), Chief NextGen Officer
 and DAC Designated Federal Officer

Exhibit 8

U.S. Department
of Transportation

**Federal Aviation
Administration**

Office of the Deputy Administrator

800 Independence Ave., S.W.
Washington, D.C. 20591

**Drone Advisory Committee (DAC) – Task Group (TG) 2
Recommended Tasking on Access to Airspace
January 31, 2017**

ACTION: Topics for discussion and analysis for DAC Subcommittee (DACSC) TG on access to airspace.

SUMMARY: As you know, the Federal Aviation Administration (FAA) has developed a roadmap to ensure the safe and efficient integration of Unmanned Aircraft Systems (UAS) into the National Airspace System. During the past several years, the agency has been fully engaged working toward the integration across a variety of platforms, multiple types of operations, and different classes of airspace to provide a structured approach to UAS integration. Since the agency established the DAC last fall, the aviation community has expressed interest in working with the DAC to develop and provide the FAA consensus-based recommendations on issues related to UAS based on discussion at the DAC's September 2016 "kickoff" meeting, the FAA requests the DAC's assistance in developing consensus recommendations regarding the operational priorities to achieve full integration of UAS.

Specifically, we seek greater input on a range of guidance material, and we believe that the DACSC is an appropriate forum to obtain industry input and perspective. We understand the DACSC, in response to direction from the DAC, has established an Access to Airspace TG. The tasking outlined in this letter is intended to facilitate the DACSC's focused and sequential review of UAS integration/access issues. It is intended that follow-on taskings will be provided as needed for additional focus and direction in order to achieve measurable progress on airspace access issues by the end of 2017.

TASK: Create an Access to Airspace TG to provide recommendations on UAS operations/missions beyond those currently permitted, and define procedures for industry to gain access to the airspace. These additional operations should be achieved within the next 24 months through a risk-based approach to gaining operational approval and certification based on FAA regulations and guidance. The near-term recommendations should be easily achievable and use existing public/private infrastructure to the greatest extent possible. The TG should provide additional recommendations on expanded access for UAS operations/missions that may require public/private infrastructure, rulemaking, and or other changes that would extend implementation beyond the 24-month time frame (*e.g.*, missions/operations in Class-B Airspace requiring interactions with Air Traffic Management (ATM) systems).

Important for the TG's frame of reference is an awareness that the FAA aircraft certification philosophy is evolving to make it more responsive to rapidly changing technology and using a risk-based approach to accommodate new mission types. To facilitate completion of the work, the TG will reference material produced by RTCA, NASA and the FAA; including UAS

operational scenarios, the UAS Traffic Management (UTM) pilot project, Pathfinder progress to date; appropriate RTCA special committee Minimum Aviation System Performance Standards (MASPS)/Minimum Operations Performance Standards for Global Positioning System (MOPS), and recommendations; and the like.

Develop Recommendations

The TG will:
1. Provide recommendations for roles and responsibilities for the UAS, the remote pilot, the operator, and air navigation service provider;
2. Provide recommendations for safe, expedited UAS airworthiness and operational approvals where required, for the various near-term (within 24 months) UAS missions;
3. Provide recommendations on minimum essential aircraft equipage, public/private infrastructure needs, and operational requirements beyond those currently permitted (such as under 14 Code of Federal Regulations Parts 101 and 107) to include information flow and interoperability considerations; and
4. Provide recommendations on methods of communications for command and non-payload communications – specifically, how these requirements may vary among the likely near-term UAS missions.

SCHEDULE: The FAA requests an interim set of recommendations at the May 2017 DAC Meeting, followed by a final report no later than the October 2017 DAC Meeting. The FAA will make subject matter expertise available to the DAC upon request.

FOR FURTHER INFORMATION CONTACT: Victoria Wassmer, Deputy Administrator (A), Chief NextGen Officer and DAC Designated Federal Official, at 202-267-8111.

Issued in Washington, DC, on February 10, 2017.

Victoria B. Wassmer
Deputy Administrator (A), Chief NextGen Officer
    and DAC Designated Federal Officer

Exhibit 9

U.S. Department
of Transportation

Federal Aviation Administration

Office of the Deputy Administrator

800 Independence Ave., S.W.
Washington, D.C. 20591

Drone Advisory Committee (DAC) – Task Group 3
Tasking on Unmanned Aircraft Systems (UAS) Funding
March 7, 2017

ACTION: Tasking on UAS funding.

SUMMARY: The Federal Aviation Administration (FAA) asks the DAC to provide recommendations for options on how to fund the activities and services required both by government and industry to safely integrate UAS operations into the National Airspace System (NAS) over the near and longer terms. The FAA would welcome consideration of a broad array of options, including industry assuming a lead role for certain aspects, or public-private partnerships between government and industry. This would include an evaluation of which activities and services are more efficiently done by the government, which could be performed effectively by industry, and considerations of short-term practicality and eventual scalability.

Most of the FAA's funding comes from aviation users, through a series of excise taxes on airline passengers and shippers, fuel taxes, and user fees for registration, aeronautical charting, and overflights of U.S. airspace. As the UAS sector is growing, so are its demands on FAA staffing and other resources. What will be required to safely integrate UAS will be an ongoing conversation between government and industry, but it is important to note that this work will be added on to FAA's already constrained budget. The FAA is committed to full integration of UAS into the NAS, which requires additional resources to support the required new and ongoing activities. The FAA has a draft plan describing the activities needed over the next two to five years to facilitate the integration of UAS into the NAS. Progress on integration is essential to maintain U.S. competitiveness in this field while also sustaining the exemplary aviation safety record.

TASK: The FAA tasks the DAC to evaluate and analyze potential mechanisms for UAS users to fund the activities and services required to safely integrate UAS operations into the NAS over the near term. The DAC is to make recommendations to the FAA reflecting a consensus view that could be used to inform near-term government action. In the event of failure to reach consensus, majority and minority reports may be submitted. FAA subject matter experts will be available to assist as needed.

Develop Recommendations

The Task Group should develop recommendations as to the UAS community's preferred method(s) for funding Federal activities and services required to support UAS operations for the next two years, and beyond. Multiple options may be explored and analyzed. The report should address:

1. Who should be responsible for conducting the identified activities and services needed to support the safe integration of UAS operations into the NAS?
   - Are there activities and services that could be performed by industry in the near-term or longer-term, or through a public/private partnership?
2. For the activities the FAA should perform, what level of funding resources are needed to support the safe integration of UAS operations into the NAS?
   - If funding is insufficient, which activities or services have the highest priority?
3. What funding mechanisms should be used to support these activities and services?
   - What activities and services should the Federal Government perform using traditional funding methods (such as taxes or fees)?
   - Should different Federal activities or services be paid for differently?
   - Should different types of UAS pay different amounts or via different mechanisms?
4. How could the funding mechanisms be implemented for the near-term, and how might they change as the industry evolves?
   - Is there a recommended phased or incremental approach?
   - What are the implementation issues and costs?
   - What incentives or unintended consequences might result?
5. What options were explored and rejected? Why were they rejected?

SCHEDULE: The Task Group's interim recommendation report should be submitted to the Drone Advisory Committee no later than June 30, 2017 to enable DAC consideration via teleconference in July. The Task Group should then consider feedback from the DAC, as well as the longer term evolution of funding, in a report by March 2018.

FOR FURTHER INFORMATION CONTACT: Victoria Wassmer, Acting Deputy Administrator and Chief NextGen Officer (ADA-1), and DAC Designated Federal Official (DFO) at (202) 267-8111; or Earl Lawrence, Director, Unmanned Aircraft Systems Integration Office (AUS-1) and DAC Sub Committee Federal Lead at (202) 267-0168.

Issued in Washington, DC, on March 7, 2017.

Victoria B. Wassmer
Deputy Administrator (A), Chief NextGen Officer
    and DAC Designated Federal Official

BACKGROUND:

The FAA faces challenges of budget instability, budget inadequacies, and lack of management flexibility. In order to facilitate the introduction, integration and on-going operations of UAS throughout the United States, the FAA requires new resources to be devoted to this task. The UAS Implementation Plan lays out the myriad UAS activities of the Agency over the next few years and many of them require additional funds.

Up to this point, the FAA's UAS efforts have been funded primarily by reallocating personnel and shifting internal funds to support these activities, which include standing up the UAS Integration Office, developing the Agency's framework for UAS integration into the NAS, and conducting the initial implementation of the Small UAS Rule (14 CFR part 107). Absorbing these costs is impacting the FAA's ability to meet its other responsibilities. While the FAA received funding for some UAS work in prior years, the requirements to meet UAS needs is outpacing the Agency's resources. Without additional funds, the FAA will not be able to keep pace with the dramatic growth in public, industry, and business demands for UAS operations.

For example, after one month of implementing the Small UAS Rule, the demand for UAS operations had already overwhelmed our traditional systems and manual processes. The current processing and backlog of Waivers to Airspace Authorizations are similar to the issues with the exemption process for Section 333 of the FAA Modernization and Reform Act of 2012 (FMRA), which grants the Secretary of Transportation the authority to determine whether an airworthiness certificate is required for a UAS to operate safely in the NAS. However the backlog of waivers is worse due to an even higher public and industry demand. The FAA does not have the funding necessary to build automation systems that would allow the agency to meet public demand. Requirements from the recent reauthorization legislation (FAA Extension, Safety, and Security Act of 2016, P.L. 114-190) may also be impacted. For example, while the FAA will be able to conduct the pilot program on airspace hazard mitigation using unmanned aircraft detection systems required under Section 2206 of the reauthorization legislation (Public Law 114-190 (July15, 2016)), the development and implementation may need third party investment, perhaps through a public-private partnership. This situation will grow more urgent as the FAA continues through the next phase of its rulemaking activities, such as enabling operations over people or beyond line of sight. And while significant UAS traffic management efforts may be borne by the private sector, integrating operations into the FAA's air traffic control automation systems will require significant capital investment. Further, any services required to respond to the growth of UAS activities, whether counter-UAS, airspace management, or other types of service will most likely require additional investment and operational funding.

Looking beyond currently planned activities, if additional funding cannot be found, progress will be greatly impacted. All related activities required for FAA to fully integrate UAS operations into the NAS over the long-term – rulemaking, developing safety standards, conducting safety oversight, developing automation and other IT systems, and conducting research – will be impacted by limitations of FAA's current funding. For example, in order to incorporate UAS into the NAS, current systems such as En Route Automation Modernization (ERAM) and Terminal Automation Modernization and Replacement (TAMR) might require significant modifications and this will require more funding.

Industry Funded Models

In terms of industry funded activities, the ARINC model provides a good example. ARINC, established in 1929 as Aeronautical Radio, Inc., is a major provider of transport communications and systems engineering solutions to commercial airlines and airports. It provides fee-based services to the aviation industry. It was chartered by the Federal Radio

Commission (which later became the Federal Communications Commission (FCC)) in order to serve as the airline industry's single licensee and coordinator of radio communication outside of the government. Through most of its history, ARINC was owned by airlines and other aviation-related companies such as Boeing, until the sale to The Carlyle Group in October 2007, and then to Rockwell Collins in 2013.

ARINC took on the responsibility for all ground-based, aeronautical radio stations and for ensuring station compliance with FCC rules and regulations. ARINC expanded to support transport communications, as well as the commercial aviation industry and U.S. military. ARINC also helps develop consensus-based, voluntary technical standards for the aviation industry.

Other examples of industry-led activities include the FAA's Designee program, where the FAA designates qualified technical people who are not FAA employees to perform certain exams, tests, and inspections necessary to comply with applicable standards. Industry conducts these activities using its own resources under FAA oversight.

The FAA does not charge U.S. manufacturers for aircraft certification; however, there are international models where authorities such as the European Aviation Safety Agency, (EASA) impose fees on applicants seeking EASA certificates of airworthiness.

FAA Funding Today

The FAA today is largely funded through a series of excise taxes imposed on aviation users. These revenues are collected in the Airport and Airway Trust Fund (Aviation Trust Fund). Congress appropriates funds for the FAA's four budget accounts from two principal sources: the Aviation Trust Fund revenues, and contributions from the General Fund of the U.S. Treasury. Though the funds in the Aviation Trust Fund are generated by users of the airspace, they cannot be used by the FAA unless first authorized and appropriated by Congress.

The FAA has experienced a continuing resolution (CR) at the beginning of each fiscal year for the last 20 years, three instances of furloughs or shut downs in the last five years, and a series of authorization extensions (23 extensions of the last reauthorization, and currently on our third extension). Without certainty about funding levels each year, long term planning becomes extremely difficult. When operating under a CR, agencies must be careful not to overspend, so programs might not move forward as quickly as desired or expected. There is also a prohibition on "new starts" during a CR, limiting FAA's ability to be quickly responsive to emerging issues.
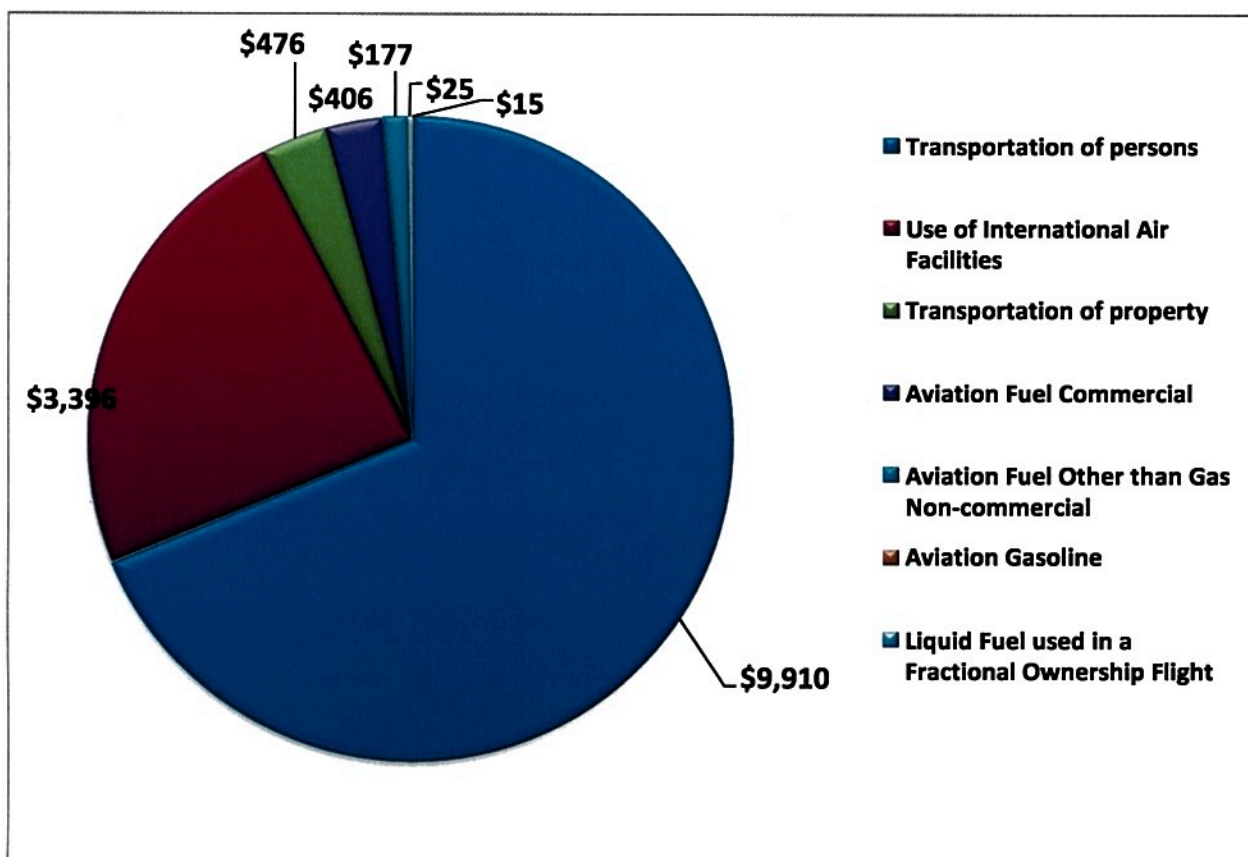
Airport and Airway Trust Fund (Aviation Trust Fund)

Created in 1970, the Aviation Trust Fund constitutes the primary funding source for FAA programs. Each year since Fiscal Year (FY) 2012 the Aviation Trust Fund has provided no less than 71 percent of the FAA's annual funding. In FY 2016, the Aviation Trust Fund constituted 87.8 percent of the FAA's funding.

The Trust Fund receives revenues from a variety of excise taxes paid by users of the NAS. Aviation excise taxes are imposed on domestic passenger tickets, domestic flight segments, international passenger arrivals and departures, and on purchases of air travel miles for frequent flyer and similar programs. In addition, taxes are imposed on domestic air cargo waybills and aviation fuel purchases. These taxes fall into four broad categories: (1) domestic transportation of persons; (2) use of international air facilities; (3) domestic transportation of property (air cargo); and (4) domestic aviation fuel taxes.

Aviation Trust Fund Excise Tax Structure

Trust Fund Excise Tax Revenue Sources	Rates effective as of January 1, 2017
Domestic passenger ticket tax	7.5 percent
Domestic flight segment tax (excluding flights to or from rural airports)	$4.10 per passenger per segment; indexed to the Consumer Price Index
Tax on flights between the continental United States and Alaska or Hawaii (or between Alaska and Hawaii)	$9.00 per passenger; indexed to the Consumer Price Index
International arrival and departure tax	$18.00 per passenger; indexed to the Consumer Price Index
Tax on mileage awards (frequent flyer awards tax)	7.5 percent of value of miles
Domestic commercial fuel tax	4.3 cents per gallon
Domestic general aviation gasoline tax	19.3 cents per gallon
Domestic general aviation jet fuel tax	21.8 cents per gallon Note: Effective after March 31, 2012 a 14.1 cents per gallon surcharge for fuel used in fractional ownership flights
Tax on domestic cargo or mail	6.25 percent on the price paid for transportation of domestic cargo or mail

Total FY 16 excise tax revenues $14,406 M

$476 $177 $406 $25 $15

$3,396

$9,910

- ■ Transportation of persons
- ■ Use of International Air Facilities
- ■ Transportation of property
- ■ Aviation Fuel Commercial
- ■ Aviation Fuel Other than Gas Non-commercial
- ■ Aviation Gasoline
- ■ Liquid Fuel used in a Fractional Ownership Flight

General Fund

The General Fund of the U.S. Treasury also provides resources for the Agency's Operations account. In FY 2016, it accounted for $1.9 billion of the $9.9 billion appropriated to that account. Over the past ten years, the General Fund appropriation has ranged from a low of $1.1 billion in FY 2015 to a high of $5.4 billion in FY 2010.

A funding option would be to consider the UAS industry an "infant industry" in need of special protections. The infant industry argument for tax (or regulatory) relief is typically invoked in cases where a nation sees the existence of potentially large external benefits from the growth of an industry, or the potential for other important non-economic benefits. With this consideration, Congress would need to be asked for additional General Fund support explicitly for the FAA's UAS-related resource requirements in the absence of any kind of tax or fee revenues from UAS.

Charging Mechanisms

The Congressional Budget Office defines a user fee as "money that the Federal Government charges for services or for the sale or use of federal goods or resources that generally provide benefits to the recipients beyond those that may accrue to the general public." User fees assign

part, or all of the costs, of programs and activities to readily identifiable users of those programs and activities.

One purpose for having user fees as a funding mechanism is equity, as they help ensure that government services are paid for--at least partly--by those who use them. A principal advantage of user fees over many other funding mechanisms is that they may foster production efficiency by increasing awareness of the costs of publicly provided services and therefore increase incentives to reduce costs where possible. One challenge of user fee funding is that this method may have difficulty achieving revenue adequacy if the basis of cost recovery relies on historic costs and the costs of providing services increase over time.

The FAA currently collects a variety of fees: overflight fees, registration fees, and aeronautical information services (aeronautical charting products) fees. The FAA also collects fees for the services of Flight Standards Service (AFS) Aviation Safety Inspectors (ASI) outside the United States; these fees recover the costs of certification services and approvals. Overflight fees are charges for costs of providing air navigation services for aircraft flights that transit U.S.-controlled airspace, but neither land in nor depart from the United States. The FAA charges separate fees for en route and oceanic airspace services; the fees charged reflect FAA cost accounting and air traffic activity data. Overflight fees fund the Department of Transportation's Essential Air Services program and do not support any FAA activities or operations.

The FAA also charges fees for aircraft registration and airmen (replacement) certification. The current fees were established in the 1950s and 1960s and have never been updated. Under the 2012 FAA Reauthorization, the FAA was directed by Congress to update fees and to begin charging fees for three additional activities (airmen certificates, airmen medical certificates, and legal opinions related to aircraft registration). At the present time, the FAA is in rulemaking to establish new and updated fees.

Since 1926, the Federal Aeronautical Charting Program has been a fee-based service. Congress transferred the program from the Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) to the FAA in October 2000. Public Law 106-181, dated April 5, 2000, provided for the FAA to charge user fees to recover the full costs of the compilation, production and distribution of both electronic and paper charts. Recently, with the rise of digital formats for our navigation and charting products and the corresponding reduction in paper sales, the Agency has faced challenges in fully recovering these costs.

In comparison with fees, a tax has the primary purpose of raising revenue. Taxes are unrequited in the sense that benefits provided by the government to taxpayers are not normally in proportion to their payment. Tax represents revenue that a government collects; such revenue typically comes from an individual or business when they perform a particular action or complete a specific transaction. Such a tax is often assessed as a percentage of an amount of money involved in the transaction e.g., a tax is often placed on the sale of goods or services, such as the aviation excise taxes explained above.

Sometimes the line between user fees and taxes is blurred, as in the case of federal gasoline excise taxes being used to fund the Interstate Highway System. This tax system is based on the

"user pays" principle in which the costs of the construction and maintenance of roadways are paid by the individuals and firms that use and benefit from the service through taxes. Like user fees, Congress can – and sometimes does – choose not to make the full amount of taxes available to a Federal agency for expenditure and the balances in a dedicated trust fund (like the Aviation Trust Fund) may accumulate and go unspent.

UAS users and operations could be taxed for FAA services in varied ways. For example, a UAS purchaser could incur a sales excise tax with the rationale that there is a likely to be a tie-in between the expected future operations of the UAS and the use of government (FAA) services. Alternatively, an excise tax could be levied on the price paid for commercial services rendered by UAS operations. This tax could be analogous to the excise tax on the price paid for the transportation of domestic air cargo. Either of these taxes (a tax on the good purchased or a tax on the service provided) would require new, and potentially, substantial federal tax administration.

Implementation Considerations

Legislative authority is required in order to provide federal revenue through user fees, taxes or the General Fund. Taxes generally fall under the jurisdiction of the tax committees, while user fees can be handled through authorizations and/or appropriations. For many years, the FAA has had an annual appropriations law prohibition on instituting new user fees, which would need to be addressed. In addition, obtaining new funding from Congress involves navigating its inherent political nature and political challenges.

Congress could set fees in statute but rulemaking may be necessary if Congress is not prescriptive enough or establishes cost-recovering user fees. For example, the FAA is currently promulgating rules updating overflight fees and for establishing new and updated aircraft and airman registry fees. If user fees are established, the FAA would most likely be the billing and collection agency for the fees. Federal excise sales taxes are administered by the Internal Revenue Service (IRS).

Fees and taxes can also change behaviors by creating disincentives or friction. For example, a transaction-based fee charged as a condition of receiving a specific service may cause people to avoid the service. This is undesirable for fees that have potential safety implications. In contrast, a point-of-sale retail tax appears to the user as essentially bundled into the retail price, and so appears simple. Its impact on the purchase decision will be influenced by its size relative to the purchase price and the overall price sensitivity of the purchaser.

Any funding mechanism will have impacts on those charged as well as practical considerations for implementation. The administrative burdens vary both for entities paying and charging. There are costs and time processes associated with establishing and collecting fees, as well as with enforcing compliance. As UAS are further integrated into the NAS, industry environment will continue to change along with the regulatory landscape. The funding solution needs to be flexible and scalable to accommodate these changes.

Lastly, options for a funding structure for UAS should not be constrained by the current traditional aviation funding structure. At the same time, as funding structure for UAS should not be expected to alter the current structure of funding for traditional aviation.

Exhibit 10

Drone Advisory Committee
May 3, 2017 Meeting Minutes

Drone Advisory Committee Meeting Minutes:

May 3, 2017- Herndon, VA

List of Attachments

- Attendees
- Agenda
- Presentations

Summary

The third meeting of the Drone Advisory Committee (DAC) convened on May 3, 2017, and was led by Brian Krzanich, DAC Chairman and CEO of Intel Corporation (Chairman Krzanich), and Designated Federal Officer (DFO) and Acting FAA Deputy Administrator, Victoria Wassmer (DFO Wassmer). The DAC received status reports from the three task groups (TGs). TG2, *Access to Airspace*, highlighted their progress on narrowing the scope of the large task of finding methods to allow operations/missions beyond those currently permitted for drones and defining procedures for industry to gain access to the airspace. Following TG2 was a report from TG1, *Roles and Responsibilities*, on the relative roles and responsibilities of the Federal, state, and local governments for regulating certain Unmanned Aircraft Systems (UAS) operations in low-altitude airspace as compared to the Federal government's exclusive role and responsibility for regulating all aspects of manned aircraft operations. Lastly, TG3, *UAS Funding*, reported on the status of their work evaluating potential mechanisms for funding the activities and services required both by government and industry to integrate UAS safely into the National Airspace System (NAS).

Host Welcome

The meeting was hosted by the Air Line Pilots Association (ALPA) at their Herndon, Virginia Headquarters. Captain Tim Canoll, President of ALPA, began the day by welcoming everyone to the facility and providing background information about ALPA.

DFO Statement

The DFO statement was read by DFO Wassmer at 9:04 AM.

Chairman's Welcome

Chairman Krzanich welcomed everyone to the meeting and reviewed the agenda noting that there was much work to be done during the day.

Approval of Minutes from Previous Meeting

The minutes of the previous meeting were unanimously approved as distributed.

Chairman's Report

Chairman Krzanich offered remarks to begin the day's sessions. He offered thanks to FAA Administrator Huerta and DFO Wassmer for their leadership and to the FAA for forming and supporting the DAC. He further thanked the FAA staff and management of the David J. Hurley Air Traffic Control System Command Center in Vint Hill, VA for a tour of their facility and the National Air Traffic Controllers Association staff for hosting the previous evening's dinner. He thanked Captain Canoll of ALPA for hosting the meeting at their Herndon headquarters. He lauded ALPA's history of safety and recommended the DAC learn from and emulate that record. The Chairman then welcomed three new DAC members: George Kirov of Harris Corporation, Michael Chasen of PrecisionHawk, and Rich Hanson of the Academy of Model Aeronautics.

The chairman then drew the committee's attention to the progress the TGs were making. He reminded the committee of the three TGs and their taskings. He thanked the TG leaders and members as well as the membership of the entire DAC Subcommittee (DACSC).

The chairman encouraged everyone on the committee to participate and engage in the discussion and make sure their sentiments are heard and understood.

The chairman mentioned that he heard some member constituencies feel their voice is not being heard. He encouraged anyone who feels that way to let the DAC leadership know so that it can be addressed.

FAA Update
Victoria Wassmer, FAA Acting Deputy Administrator, Chief NextGen Officer, and DAC DFO

DFO Wassmer welcomed everyone and thanked them for attending. She described the second annual FAA UAS Symposium held in Reston the previous month. She thanked the industry partners who assisted in the planning and execution of that symposium. She described the numbers of attendees, panels, and panelists. She described the FAA's first ever "Twitter chat" as a great success. She

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mentioned the need for the FAA to engage with a variety of stakeholders and the need for the FAA to continue its work in education and outreach efforts.

DFO Wassmer then provided an overview of the January 2017 DAC meeting and the important safety issues that must be addressed as they expand the use of drones in the airspace. An example is what happens to people on the ground if a drone flies overhead and fails? She discussed that the FAA's Center of Excellence (COE) completed the first in a series of a research projects on this topic and released the results the previous Friday. She also mentioned that there are also security concerns and the need for drones to avoid secure facilities and sensitive sites. She referenced overseas use of drones for ill-intent in combat theaters and stressed the need to ensure that does not happen here. She stated that the FAA requires assistance in answering these questions.

She mentioned two recently announced initiatives that enable the FAA to work with industry, law enforcement and national security counterparts to address these security concerns. The FAA is in the process forming a new aviation rulemaking committee (ARC) for remotely identifying and tracking UAS. The desire is that the recommendations from this ARC will pave the way for UAS identification and tracking rulemaking which will then promote future rulemaking for beyond visual line-of-sight (BVLOS) and flight over people operations.   The FAA will be hosting an unmanned aircraft security roundtable to be held with transportation and national security leaders and the drone industry. This will allow a mutual understanding of security concerns and allow the best ideas to come forth. Just like the DAC, it is important that everyone with "skin in the game" have a seat at the table.

DFO Wassmer presented two slides that show the progress made by the FAA and the DAC. The first slide, entitled "History of the Drone Advisory Committee" illustrated the flow and dates of when the FAA has issued the terms of reference for the DAC, DACSC, and TGs as well as the dates of the meetings. The second slide depicted the flow of how the work that is done by the TGs gets vetted, through the consensus process, through the DACSC and the DAC, before any final recommendations are sent to the FAA. Victoria emphasized that RTCA is an advisory committee that provides advice and recommendations to the FAA. She emphasized the importance of the work being done and reiterated her thanks to the DACSC and the TGs. She encouraged the DACSC to stay focused on the tasks at hand, and to speak up and speak often, especially if there is disagreement, because as the slides show, consensus at each level should be obtained before materials are put forward to the next level. She referenced the slide shown on the screen which depicted how the tasking statements from the FAA should guide the work of the DAC, DACSC, and TGs. While the process may seem cumbersome, the dialogue is important. The policy issues being considered and society's acceptance of the technology are very important. She reminded participants that everyone has a voice and a responsibility to speak up for their constituents, and there should be no silent minority – please. To get this right, the FAA

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needs each and every one of the committee members. She closed by saying she looks forward to a productive meeting.

Earl Lawrence, Executive Director, UAS Integration Office

Mr. Lawrence provided an update on FAA activity since the January 2017 DAC meeting. Over 800,000 people have registered and more than 43,000 applicants have obtained their Remote Pilot Certificate. The Remote Pilot Knowledge exam pass rate has increased from 89% to 92%. Assisting pilots to fly safely under part 107 rules remains a focus area for the FAA. The FAA is continuing work on an automated authorization and waiver process to be deployed in the near future. Finally, the FAA is working hard to meet the demands for airspace access. The number of airspace waivers and authorizations has increased from 1,500 in January to 3,900 and more than 650 non-airspace waivers have been issued (up from 300 in January). At the last DAC, concerns that Pathfinder partners were receiving preferential treatment for BVLOS waivers were discussed. At the May 3rd meeting Mr. Lawrence assured the DAC that is not the case. The most recent waiver was for BVLOS and flight over people and was issued to FLIR Systems, Inc. The UAS is small and FLIR has implemented the appropriate safety mitigations. Diana Cooper of PrecisionHawk helped educate BVLOS applicants at the FAA UAS Symposium. Updates to the waiver portal expected after the Office and Management and Budget review this spring. Updates will assist operators in obtaining waivers.

Other notable accomplishments cited by Mr. Lawrence included: 1) attendance at the 2017 UAS Symposium, where over 600 stakeholders convened and over 250 attendees made use of the FAA's resource center; 2) FAA support for external conferences by airport associations, agricultural community, remote pilots, and local law enforcement; 3) addressing Congress twice (Senate Committee on Commerce, Science, and Transportation and House Subcommittee on Aviation); 4) Briefing the DACSC, TG3 specifically, on how the FAA is funded and operates, and the offer to present additional webinars and presentations if they will be valuable to the DAC/DACSC; 5) Facilitated the announcement of new ground collision severity research findings conducted by the Alliance for System Safety of UAS through Research Excellence (ASSURE) program. The research results may be found on the FAA UAS Integration website and the ASSURE website; 6) Continued partnerships with other government agencies, such as the Departments of Energy (DOE), Justice (DOJ), Defense (DoD), Homeland Security (DHS), Interior (DOI) and the Secret Service; and 7) the formation of the remote identification aviation rulemaking committee to look into available and emerging technology to aid in identifying UAS. Mr. Lawrence closed by sharing thoughts on what the FAA is looking for in DAC recommendations: they should be policy-focused, performance-based, achievable and realistic, specifies an action or approach, and addresses the appropriate entity (FAA or larger US Government) as well as prioritized.

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Lynn Ray, Vice President, Mission Support Services, Air Traffic Organization

Ms. Ray briefed on the work the Air Traffic Organization (ATO) is conducting to support UAS integration. ATO is using section 99.7 temporary flight restrictions (special security instructions) to address national security concerns at select sensitive locations across the NAS, starting with 133 sites identified by the DoD that are now displayed on an Esri website. The ATO is continuing to work with other Federal partners (DOI, DHS, and DOE) to identify about 10-20 additional sites, and the United States Air Force is looking at 700 additional sites. This is a short-term solution; the long-term solution, as required by section 2209 of the FAA Extension, Safety, and Security Act of 2016, will likely be some form of rule-making action.

Another capability found on the Esri website is interactive maps to allow applicants for part 107 authorization to find out altitude and proximity guidance in respect to airports. The capability does not provide an authorization to fly; it merely streamlines the part 107 process.

Ms. Ray then discussed a new prototype capability coming online called Low Altitude Authorization and Notification Capability (LAANC). FAA does not intend to own this system in the long run. This is a way to exchange information with operators in the near term. LAANC automates the authorization for operations and can also be used by hobbyists.

The last thing Ms. Ray discussed is an upcoming UAS in Controlled Airspace ARC. This ARC builds on the original Small UAS ARC that dealt with more high-altitude airspace. This ARC will work over a 12-15 month period to produce recommended scenarios encompassing most desired operations, identifying gaps in research and development to inform integration, recommend prioritized changes/additions to policies and capabilities to achieve integration.

Marke "Hoot" Gibson, Senior Advisor on UAS Integration

Mr. Gibson provided updates in the Federal and security realm. He discussed (as Mr. Lawrence noted) that he testified before the House Subcommittee on Aviation with another FAA employee located at the William J. Hughes Technical Center. They provided data on FAA status, what Congress can do to build a 21st century aviation infrastructure that can support and enable innovation, and provided an update on work at the William J. Hughes Technical Center, COE. He fielded questions from the committee on how the FAA was working across lines of business and on the operations concept for hazardous airspace mitigation around airports. He provided an update on the UAS ExCom (DoD, DHS, National Aeronautics and Space Administration, Department of Commerce, DOJ, Office of Science Technology and Policy, and the National Security Council), which is a committee of Federal Government agencies designed to increase UAS security coordination.

Mr. Gibson stated the ExCom is finalizing its draft counter UAS operations concept to determine roles and responsibilities for operators operating near airports and other critical infrastructure. The draft report is scheduled to be presented on June 9, 2017 at the next ExCom meeting. The ExCom continues to be greatly concerned about operations near airports. Work began 16 months ago, driven by language in the FAA reauthorization. Mr. Gibson reported on his work with airports such as Atlantic City, John F. Kennedy, Eglin Air Force Base, Denver, and his trip to Helsinki (and federal prison tour). The FAA concluded testing in Dallas/Fort Worth Airport in the last two weeks. The FAA is not the only agency working on UAS detection around airports. DHS partnered with US Army and FAA observed a test in New Orleans. Most of the Army system encountered problems including line-of-sight radio detection system problems, high density radio-frequency environment interference, zero Doppler radar for slow moving UAS, and masking when in and around other vessels.

Comment: A DAC member was approached by the Tappan Zee Bridge Project and advised that they could not conduct drone operations. The issue is that local law enforcement cannot tell when a drone is authorized and when it is not. A "No Drone Zone" will not work for this reason.

RTCA Update
Margaret Jenny, President

RTCA walked the committee through the process of the Federal Advisory Committee Act (FACA) that drives the work of Federal Advisory Committees (FAC) and provided additional material to supplement DFO Wassmer's presentation.

Ms. Jenny discussed the roles and responsibilities of the FAA, RTCA, and the FACs. She showed a slide that graphically depicted the organizational process flow among the principle roles (FAA, RTCA, and committee) in the development of recommendations.

She further led a discussion on what consensus means. She emphasized that consensus is not voting, but rather a means to ensure that all voices are heard and all offer constructive inputs. With consensus, not everyone gets everything of what s/he wants. Everyone contributes to the outcome and comments include constructive alternatives. To be specific, consensus means that everyone can live with and support the results. If there are dissenters, the non-concurs are documented and transmitted along with the committee rational for disagreement with non-concur.

Comment: There has been some discussion that there are gaps in representation and it is important for the DAC to understand who is not represented and to fill those gaps.

Question: Is there any learning from the DAC domain survey?

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Answer: We are still receiving responses and when it is completed and compiled we will identify gaps and begin to work to fill them.

Question: A DAC member representing an association alerted the FAA that a member of his association served on an ARC and has been subpoenaed and wanted to know the policy covering that.

Answer: The FAA is working this issue will follow up with the member.

DAC Subcommittee Co-Chair Report
Bryan Quigley, Managing Director and System Chief Pilot, United Airlines and Nancy Egan, Advisor, 3D Robotics

Captain Quigley began the co-chair report by thanking ALPA and Mr. Lawrence. He recognized the efforts of the RTCA program director. He then reviewed his background and the background of his co-chair, Nancy Egan. He thanked DFO Wassmer, Mr. Lawrence, Ms. Ray, and Mr. Gibson for providing guidance and giving him the chance to serve. He also thanked Chairman Krzanich and the TGs for their hard work. He indicated he is looking forward to giving actionable advice to the FAA. He then reviewed the TG roles and indicated that the pace of DACSC meetings may seem slow and methodical. Despite that, he wanted the DAC to know that they are moving quickly, which occasionally results in some not being able to participate. He briefly reviewed the roles of various members (members, subject matter experts, observers) and the role of FAA briefers in the education of the DACSC. He closed with an observance that what is needed is active participation on the TGs. He stated that members must be actively involved – this is not a spectator sport.

Ms. Egan expressed similar views on what she wishes the DACSC to achieve. She addressed the issue of state and local folks feeling they have not been heard. She stated she has begun an outreach program. She said likes to encourage "aha" moments and had one of her own. Originally, the discussion was unmanned versus manned; those groups are coming together over the past 2 years; now they need to bring in a third voice as state and local folks approach things differently. We are all learning – we need to remain flexible and ensure that everyone participates.

Captain Quigley then recognized the DACSC by asking them to identify themselves. He stressed that the perspectives of the member shapes the engagement on the TGs and the resulting recommendations.

TG 2 – Access to Airspace Report Out
Rob Hughes, Senior Policy Advisor, Northrup Grumman Corporation and Sean Cassidy, Director, Safety and Regulatory Affairs, Amazon Prime Air

Mr. Hughes began the report with thanks to ALPA, RTCA, and the DAC members as well as FAA colleagues. He reviewed the make-up of the TGs. He observed that much has been done in 2 months and asked the committee to provide comments on whether the TG is headed in the right direction and what should be the next steps. He indicated that the TG is focused on building consensus and as co-leaders, he and Mr. Cassidy have a desire to engage responsibly. The task statement is the touchstone for the group and they have developed assumptions and guiding principles to help steer the work being done.

Mr. Cassidy reviewed the TG2 methodology and approach, which was to collaborate and educate, build and leverage consensus, and make rapid progress. To that end, they have developed five issue papers and draft recommendations.

He stated the recommendations should not reflect a single view and should be a multi-party effort. The TG organically developed into five focus subgroups:
1. Low altitude operations within the Mode C Veil
2. Equipage requirements
3. Leveraging existing cellular networks for command and control (C2)
4. Operational and airworthiness certification requirements for commercial UAS BVLOS operations
5. Future needs for airspace access beyond the 24-month timeframe.

With the assistance of MITRE, the TG looked at use cases to narrow the focus of the problem space. The current draft recommendation groups from TG2 include:
- Prioritize sUAS BVLOS operations within the Mode C Veil below 400 ft
- Develop technology-neutral navigation performance requirements
- Evaluate the existing cellular networks to meet low-altitude UAS C2 requirements
- Establish a CFR 14 Part 135 regulatory pathfinder program for commercial UAS low-altitude BVLOS operations
- Beyond 24 month timeframe recommendations.

Question: Public acceptability – is the TG thinking about how to roll this out and gain public trust first?

Answer: The TG also began to develop guiding principles and tenets – the core message that safety is of upmost importance is primary. Ushering in changes to accommodate UAS with safety as a paramount metric, (risk controlled mechanisms) allows for a slow, steady increase in complexity and diversity of

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operations. The evolution begins with defining the process path and articulating the minimum required safety for each operation.

Question: In looking at full integration, do you envision any issue with scalability?

Answer: That drove several recommendations of the TG. Namely, recommendation 4 (part 135) led to recommendation number 5. The use of land-mobile networks takes 7 different standards groups and aligns them – resulting in a scaled capability.

Question: Assuming unmanned aircraft will eventually go above 400 feet – did you examine the carrying of passengers? There are UAS vehicles that are now full production (optionally piloted) aircraft. Did the recommendations take that into account?

Answer: In response to the production aircraft question, you need an airworthiness certification for commercial on-demand operations (e.g., firefighting). The FAA must identify the minimum design and performance standards (through a risk-based lens) for type certification requirements. Using a risk-based approach, the safety case will determine the certification requirements. Operational supply chain, and recurring training and auditing functions for continuing operations all need to be considered.

Question: Will UAS integrate into the existing airspace as another aircraft type? Will manned aircraft not be denied access to airspace?

Airspace: That is a logical conclusion for an end-state – there may be intermediate stages that lead to that. That may be better answered by the FAA.

Question: Are you discounting visual Line-of-Sight (VLOS) by focusing on BVLOS?

Answer: No - there are rules in place for VLOS.

Comment: As you look at the 24-month horizon, the ADS-B mandate should help around the airports for BVLOS.

Question: Did you consider what it will take for FAA to scale up the waiver request? Part 135 is held to higher standard over part 91 - any potential victim was a by-stander. Why should commercial operations be held to a higher standard than private operations?

Answer: FAA is not saying they should be held to a higher standard; rather minimum standards to perform and operation will be less. LAANC automates the manual process. The automated process is

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derivative and expeditious of the waiver process. A similar part 135 process should be developed eventually.

Question: For the third recommendation (developing the cellular network), did you consider the impact on 911 and emergency network?

Answer: There is an evaluation ongoing and the 911 system is included in that evaluation.

Question: Recommendation 3 seems very detailed in the technology - shouldn't we be looking at a more generic technology?
Answer: Agree it is a concern. The team didn't declare this single technology would be used but is representative of the technology to be used. This study explored how the C2 requirement could be used, but doesn't mean they will be the only answer. The recommendation is to evaluate the spectrum for aviation application. RTCA SC-228, Minimum Operational Performance Standards for UAS, is looking at other technologies: 3G, 4G and 5G are also being looked at.

Comment: SC-228 is being neutral in developing a Minimum Operational Performance Standards (MOPS). Suggest changing the language to say an assessment is being done and don't list the specific technology.

Comment: The section of navigation was generic and specified integrity; communication should be equally vague and only specify availability/reliability.

Comment: Looking across the FAA's broader vision of what NextGen will need, it's important that we think about the period of time and synchronize it with what NextGen is thinking about (along with the NextGen Advisory Committee).

Comment: NextGen is important – airports' current efficiency and safety/capacity must not be compromised and systems of today and the future for airports should continue to be a focus.

Summary: The chairman summarized the discussion to say recommendation 3 should be adjusted to be more of a performance-standards based approach and less about technology. The section should address technologically-neutral components. RTCA will summarize the comments received for each task group and submit for their review and consideration.

TG1 – Roles and Responsibilities Report Out
Brendan Schulman, Vice President of Policy and Legal Affairs, DJI Technology and Dr. John Eagerton, Chief, Aeronautics Bureau, Alabama Department of Transportation/National Association of State Aviation Officials (NASAO)

Dr. Eagerton, representing NASAO, thanked ALPA for hosting the meeting and observed they are a gold-standard aviation group that to which all others admire. He noted that TG1 is looking at not only how to integrate drones into the airspace, but also integrate into society. All levels of government are involved will be touched as this industry expands. He further complimented TG2 on the great work they've completed so far.

Mr. Schulman echoed those comments. He noted that TG1 has worked very hard and a lot of work is still ongoing. Not all their work will be seen today. TG1 is addressing an important and challenging set of issues and there is significant and appropriate interest in the roles and responsibilities question. He believes we should think creatively, not about pre-emption and zoning, but rather look at what's required to meet the needs of local government and FAA. How can we conceptualize the airspace differently and the relative roles and responsibilities of FAA and local government? Drones are more personal than airplanes and will be managed differently with respect to enforcement, education, and technological tools and solutions. He then reviewed the TG1 work to date.

Dr. Eagerton then explained the methodology used to set priorities. The DAC wanted the TG to move forward and address the priorities and add method and structure to the tasking. The TG decided to use a method called Analytic Hierarchy Process (AHP). The benefits of this method are multi-stakeholders help prioritize issues. He then described how AHP works and the criteria used to determine priorities. He further explained how they were applied to the issue areas:
- Importance of issue area
- Relevance of the UAS problem
- Foundational nature of the issue
- Timely consideration on recommendations.

Mr. Schulman noted that in the desire to identify the highest priority issue, the results indicated the foundational nature of the issue was most important and there was less desire to rush to recommendations and conclusions. He then outlined the ordered priorities as:
- Enforcement
- Relative roles and responsibilities
- Enforcement of federal safety and airspace rules and regulations

- state and local interest in and response to UAS
- Education
- Defining low-altitude UAS navigable airspace susceptible to state and local government interests
- Tech tools and solutions.

The group has undergone an extensive education campaign, bringing in many subject matter experts to brief them. Additional time is necessary to come to a consensus-based solution. The next steps are to obtain the DAC's thoughts on what has been done and should be done in the future, continue to receive feedback from stakeholders and subject matter experts, address stakeholder interests in the work, (all voices are welcome) and welcome state and local input and will report more details at the July DAC.

Question: Helicopter Association International understands and respects zoning control by cities. There are hundreds of laws being written. We are now wondering at what altitude a local government can regulate aircraft. Drones are considered by FAA to be aircraft. It appears state and municipal authorities are breaching the pre-emption rules with their laws. Will helicopter pilots need to know the patchwork of laws? State and local governments should coordinate with FAA just like they do with manned aircraft. The ability of every city/state to manage drones will lead to bigger aircraft. This is a major question that must be resolved. What are the FAA thoughts on what their action will be and why they aren't exerting control of their role?

Comment: It used to be that I assigned aviation issues to the airport director. Entire cities are transformed by drones to be airports in and of themselves. There is much interest by mayors across the country concerning altitudes, zoning, enforcement, information control. Mayor Lee embraces the desire to get city and county thoughts as there will be resistance to drones. The mayor requests that cities be engaged in the conversation. Mayors are dealing with many issues (e.g., homelessness, housing, crime, jobs). Ask mayors across the country and invite more intense dialogue in this area. Mayors are becoming airport directors because of this technology.

Comment: I congratulate the TG for taking on this huge task. Prioritization exercise discussion - enforcement QueryQueryand relative roles are tied together. FAA currently knows and understands how to handle the existing system, but lacks the clarity of understanding on what state and local governments want to regulate. This is not a black-and-white issue - this tasking should help define how those co-exist. Cities decide where the airport is located, then, the FAA defines how it is to operate. Co-existence is what we're after in this space. Cities can't be considered airports; FAA inspectors can't adjudicate homeowner's complaints for use of their property. We need a uniform system over all. Need to create space on this TG to bring definition on where there might be consensus.

Discussion continued on the role of cities in regulating UAS and if that will eventually be applied low-altitude manned aircraft.   The resultant responses indicated that more work needs to be done to answer this question and the city/state governments need to be in the discussion. Engagement of cities/states could be through a poll (discussed previously, but time constraints prevented one from being developed). Use cases to help define the scope of the problem space, and gap analysis. To help narrow the conversation, Marily Mora and Robert Boyd suggested that the DAC help facilitate relevant organizations getting invited to attend the US Conference of Mayors convention in June and the National Association of Counties convention in July and both educate and solicit more feedback from the participants there.

The topic of how UAS increase employment was introduced. It was observed that drone operations could have a negative effect on employment, while the industry believes it will be positive. Some commented that the jobs created will require different skills than the jobs lost due to drone.

The chairman summarized the discussion and added that technology does not always decrease employment rather new skills are required. Mayors are responsible for navigating cities through the introduction of drones. The TG may be focusing on enforcement before the DAC knows what the state and local interest is. So, TG1 should re-look at priority 4 (State and Local Interest in and Response to UAS) with more attention. The DAC can help educate legislators at the upcoming local conferences.

How can the DAC help at the two conventions discussed? RTCA is to help identify DAC members who wish to assist in addressing the county and city conventions and to assist in defining what output they can produce that will benefit the two conventions and also to work with member Mayor Lee's office and Robert Boyd to get on the agendas of (or include focus group sessions) at both conventions.

TG3 – UAS Funding Report Out
Mark Aitken, Director of Government Relations, AUVSI, and Howard Kass, Vice President of Regulatory Affairs, American Airlines

It was observed that TG3 started later than the others and the co-chairs thanked everyone for their patience. TG leaders observed that 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. Current FAA funding levels and mechanisms will not support timely integration. The UAS Implementation Plan lays out the myriad UAS activities over the next few years.

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The co-chairs then reviewed the tasking statement and determined 3 possible mechanisms for funding: government, industry, or a hybrid partnership approach. The assumptions and guiding principles and timeframes of the TG were reviewed and set the tone for the discussion of how the group will approach its work. The July meeting is for short-term recommendations with longer-term recommendations coming in November.

The mechanism for decision making was reviewed by the co-chairs (Decision Lens' AHP) that led to a ranking of the activities to be reviewed. A lot of help from the FAA was received in identifying these activities. There appears to be a natural synergy with TG2 (Access to Airspace) as they identify technology required and when, and TG3 as they identify how to fund that technology in the same timeframe.

The next steps for the TG are to:
- Collect and consider DAC feedback
- Engage subject matter experts and the FAA
- Analyze the data reduction and trade study results
- Assign focus groups with writing assignments
- Present the work and short term funding options at July 21, 2017 DAC virtual meeting.

The group currently believes that the FAA has to find new funding resources.

Question: With regards to FAA transformation - are you considering a transformative, risk-based approach from heavy certification to risk-based?

Answer from FAA: Yes - there are several efforts that include privatization. Aircraft certification is being reorganized with the part 23 rewrite. Performance based standards and requirements are desired by the FAA and there is more organizational delegation. It is not believed these efforts will affect the work of TG3.

Question: Are there resources that communities can bring on to support the activities. Where will the funding come from?

Answer from the FAA: TG3 brought up law enforcement needs and the FAA does not want to create unfunded mandates – it is critical that this be addressed.

Question: The National Academy of Sciences held a symposium on public-private partnerships (PPP) with NASA and government - how can these methods help fund these activities?

Question: Whether it will be a Cooperative Research and Development Agreement or PPP won't be part of what can be done to define the funding stream. There must be viable methods to do it, however.

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Answer: An informal survey was initially done to capture the group's thoughts for where each activity fell in funding mechanism spectrum. That may need to be revisited.

Question: How do you ensure, with an in-place architecture that is great but aging, the economic funding makes the right assumptions for technology of the future based on today? Assuming technology is improving, how can it be leveraged today rather than developing new technology (make the current system more scalable)?

Answer: The TG is looking at next 2 years. Technology won't advance enough to help in that timeframe. Some of what is done to help UAS will eventually help manned aviation; where that convergence is, no one knows but we believe it is many years away. The group does not want to do anything to degrade the current safety level of the system.

Comment: Manned aviation can benefit from unmanned aviation.

Comment: NextGen air traffic control was introduced as transformational technology more than a decade ago, yet it has not been effectively deployed because of a year-to-year budget cycle. When we think about what we'll do, we should think differently (e.g., lobbying for appropriations, adding fees on users of drones).

Comment: The current strategy in NextGen is to employ a best-equipped-best-served approach. The big challenge is to make that happen. Technology comes fast but current infrastructure has benefits that won't be replaced easily.

Comment: Thinking outside the box was part of this TG's assignment.

Comment: The future involves helping the FAA rewrite the rules to help industry move at the pace they wish to move.

New Business

No new business was presented.

Dates and Agenda (if known) for Next 2 Meetings

- The next (fourth) meeting of the DAC will be a virtual meeting scheduled for July 21, 2017.
- The fifth DAC meeting is scheduled for November 8, 2017 at a TBD location.

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Action Items

Action	Responsible Party	Schedule	Status
ACTIONS OPEN FROM PREVIOUS MEETING			
None			
NEW ACTIONS			
TG2 to adjust recommendation 3 to be more standards based and less about technology	TG2	July	OPEN
RTCA to summarize the comments received for each TG and submit for their review and consideration	RTCA	ASAP	OPEN
TG1 re-look at priority 4 (state and Local Interest In and Response to UAS) with more attention	TG1	July	OPEN
RTCA to help identify DAC members who wish to assist in addressing county and city conventions, and to assist in defining what output can be produced that will benefit the two conventions; and work with members Mayor Lee's office and Robert Boyd to get on the agendas or set up focus group sessions at their conventions	RTCA	July	OPEN
RTCA to coordinate a webinar for SC-228 that can be reviewed by all DAC members	RTCA & SC-228	ASAP	OPEN
FAA to determine if members of committees and ARCs are required to divulge discussion material due to being subpoenaed	FAA	ASAP	OPEN

Attachments