



Legislative Analysis

Federal Aviation Administration Reauthorization Act of 2017

Title II, Subtitle A—Unmanned Aircraft Systems Reform

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Executive Summary

This report examines Title II, Subtitle A of the Federal Aviation Administration Reauthorization Act of 2017. In particular, it provides an overview of those sections related to the operation and integration of unmanned aircraft systems in the national airspace, focusing on Parts I, II, III, and IV of Subtitle A. In addition, it offers an analysis of the most substantive portions of the legislative text that relates to the integration of unmanned aircraft systems, or drones, into the national airspace.

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Introduction

Although the Senate FAA Reauthorization Act of 2017¹ contains a number of tangential sections (most notably those related to the privatization of air traffic control) that are important for fostering the growth, development, and integration of commercial drones into the national airspace, this analysis focuses exclusively on Title II, Subtitle A—Unmanned Aircraft Systems Reform.

The four parts comprising Subtitle A are broken up to accommodate a summary of each individual section, followed by an analysis of the sections comprising each part. The analysis concludes with some overarching recommendations that might improve upon the existing legislative text and help hasten the integration of unmanned aircraft systems into the national airspace.

Section-by-Section Analysis

Definitions

For the purposes of this analysis, the term small unmanned aircraft system (sUAS), as defined by the bill, refers to “an unmanned aircraft weighing less than 55 pounds, including the weight of anything attached to or carried by the aircraft.” The term unmanned aircraft system (UAS) is defined as “an unmanned aircraft and associated elements (including communication links and the components that control the unmanned aircraft) that are required for the operator to operate safely and efficiently in the national airspace system.” Unless mentioned otherwise, “appropriate committees” generally refers to the Senate Committee on Commerce, Science, and Transportation and the House Committee on Transportation and Infrastructure.

Part I: Privacy and Transparency

Sec. 2101 establishes that the official policy of the United States is that UAS operations “shall be carried out in a manner that respects and protects personal privacy consistent with the United States Constitution and Federal, State, and local law.”

Sec. 2102 establishes that commercial UAS operators should have a written privacy policy, updated regularly and available publicly, “that is appropriate to the nature and scope of the activities regarding the collection, use, retention, dissemination, and deletion of any data collected during the operation of an [UAS].”

¹ Available here at https://www.commerce.senate.gov/public/_cache/files/1e5fb629-5fde-49da-9e09-e7bfce702c99/FDA7993A27A984DBEC38510A5DA60E58.s.-1405---faa-bill.pdf.

Sec. 2103 grants the FTC authority to address privacy violations resulting from sUASs operating “in the furtherance of a business enterprise,” subjecting violators to the FTC’s Section 5 authority to police “unfair and deceptive” practices.

Sec. 2104 directs the FAA to establish a searchable database that identifies individual owners of UASs and, with the exception of newsgathering organizations protected under the First Amendment, includes a wide range of other information, including the circumstances under which the UAS is operated, where it is operated, and the types of information collected, among other things.

Sec. 2105 charges the Comptroller General with producing a report that identifies the current landscape of privacy laws (local, state, and federal) “that address an individual’s privacy,” as well as specific concerns that may not remedy privacy violations resulting from UAS operations. That report is then to be submitted, within one year of the bill’s enactment, to the appropriate congressional committees.

Analysis

Overall, the privacy and transparency provisions of the bill are reasonable. The sense of Congress doesn’t suggest any particular set of policy recommendations for data retention or minimization procedures, but instead focuses on ensuring commercial actors have sufficient leeway to construct their own policies. Those policies, in turn, are subject to FTC enforcement measures, which is a far preferable alternative to ex ante statutory measures that would limit commercial innovators to a set of established policy guidelines.

The construction of a searchable database of drone operators, however, may be cause for concern—especially given the type of information it would include. One could very easily imagine a situation where UAS operators, especially non-commercial users, feel unwary about such information being publicly available, and opt to circumvent any registration process that would list their information in the proposed database. Alternatively, making such information openly available may help ease public fears over what sUASs are doing in their local communities, who is operating them, and for what purpose(s). As a result, the development of such a database, while not necessarily warranting outright opposition, should be viewed with healthy skepticism. A sunset provision, which should be coupled with language that permits the purging of accumulated information, should be considered as an added component of **Sec. 2104**.

Finally, the production of a report examining the current state of domestic privacy laws, ordinances, and statutes at all levels of government is a good recommendation that can help better inform researchers and analysts looking at the intersection of privacy and emerging technologies.

Part II: Unmanned Aircraft Systems

Sec. 2122 details the program for the use of test sites “to facilitate the safe integration of [UASs] into the national airspace system.”

Sec. 2123 mandates that within 60 days of the bill's enactment, the FAA Administrator shall "charter an aviation rulemaking advisory committee" to develop recommendations for:

- Risk-based, consensus safety standards for the incorporation of UASs into the national airspace "that can evolve or be updated as appropriate;" and
- A "process for permitting, authorizing, or approving small unmanned aircraft systems and their operations," based on the risk-based, consensus safety standards that are developed.

In developing those safety standards, the committee is tasked with considering, among other things:

- "Technologies or standards related to geographic limitations, altitude limitations, and sense and avoid capabilities;"
- "Using performance-based standards;"
- "Predetermined action to maintain safety in the event that a communications link between a small unmanned aircraft and its operator is lost or compromised;"
- "Detectability and identifiability to pilots, the [FAA], and air traffic controllers, as appropriate;"
- "Means to prevent tampering with or modification of any system, limitation, or other safety mechanism or standard under this section or any other provision of law, including a means to identify any tampering or modification that has been made;"
- "Consensus identification standards;"
- "Cost-benefit and risk analyses regarding updates to or modifications of small unmanned aircraft systems that were commercially distributed prior to the development of the consensus safety standards;"
- "Cost-benefit and risk analyses of consensus safety standards that may be accepted ... for newly designed [sUAS];" and
- "Any technology or standard related to [sUAS] that promotes aviation safety."

Further, the committee is tasked with developing these standards in conjunction with a wide array of stakeholders, including industry firms, the Department of Defense, NASA, and standards-setting bodies. Upon receipt of these recommendations, the FAA Administrator will then have 180 days to establish a process for:

- Accepting the recommended safety standards;
- Permitting, authorizing, or approving sUAS makes and models;
- Certifying manufacturers that have shown compliance with those safety standards, while further allowing the FAA Administrator to "enable self-certification ... to the standards;" and
- Permitting manufacturers, as determined by the FAA Administrator, "to alternatively satisfy the requirements" for the process of permitting, authorizing, or approving sUAS systems.

Once these processes are established, the legislation "shall allow for operation of any applicable [sUAS] within the national airspace system without requiring" airworthiness certification requirements or type certification.

The FAA Administrator will also be granted the authority (if he or she so chooses) to require sUAS manufacturers to provide the FAA with a number of pieces of information, such as a sUAS operating instructions, the manufacturer's statement of compliance with the established safety standards, recommended procedures for maintenance or inspection, and/or a sample UAS. Finally, and perhaps most importantly, the FAA Administrator is permitted to "exempt from the requirements of this section [sUAS] that are not capable of navigating beyond the visual line of sight of the operator through advanced flight systems and technology, if the Administrator determines that such an exemption does not pose a risk to the safety of the national airspace system."

Sec. 2124 deals with UAS operations in the Arctic.

Sec. 2125 provides for special authorities that permit the Secretary of Transportation to "use a risk-based approach to determine if certain unmanned aircraft systems may operate safely in the national airspace." That determination is premised on whether a UAS' "size, weight, speed, operational capability, proximity to airports and populated areas, operation over people, and operation within or beyond the visual line of sight, or operation during the day or night, do not create a hazard to users of the national airspace system or the public." It also establishes the need for the Secretary to provide "reasoning ... and seek public notice and comment" if she decides "to require an operator of an unmanned aircraft system to hold an airman certificate, a medical certificate, or to have a minimum number of hours operating a manned aircraft." Finally, the authorities granted to the Secretary under this section are sunsetted on September 30, 2021.

Sec. 2126 provides a sense of Congress that beyond visual-line-of-sight (BVLOS) operations, nighttime flights, and flights over non-operator operations all have "tremendous potential" to grow the economy, spur innovation and development, and improve emergency response to infrastructure assessments. For sUASs weighing less than 4.4 pounds—commonly referred to as micro UASs—the text describes operational conditions, and imposes similar restrictions as those imposed on sUASs (although there appears to be no restriction on flights over non-operators).

Sec. 2127 addresses the issuance of guidance (as well as certification) for use of UASs by government agencies. It also imposes a data minimization requirement on the collection, use, retention, and dissemination of data collected by government-operated UASs.

Sec. 2128 prohibits the FAA from promulgating new rules related to model aircraft operations if the model aircraft is flown for recreational or hobby purposes, and contingent on a number of requirements. In order to qualify, the model aircraft UAS must, among other things:

- Be "operated in accordance with a community-based set of safety guidelines and within the programming of a nationwide community-based organization;"
- Remain within VLOS of the operator at all times;
- Give way to manned aircraft;
- Not fly at an altitude above 400 feet; and

- Be operated by an individual who has “passed an aeronautical knowledge and safety test administered by the [FAA] online ... or developed and administered by the community-based organization.” This individual must also maintain “proof of test passage to be made available to the Administrator or law enforcement upon request.”

There is also a savings clause, which states: “Nothing in this subsection shall be construed as expanding the authority of the Administrator to require operators of model aircraft under the exemption of this subsection to be required to seek permissive authority of the Administrator prior to operation in the national airspace system.”

A “model aircraft,” as defined in the section, is any unmanned aircraft that is (1) capable of sustained flight, and (2) weighs less than 55 pounds, including attachments.

Sec. 2129 restores the registration and marking requirements for sUASs that were originally passed by the FAA, but recently vacated by the U.S. Court of Appeals for the D.C. circuit (*Taylor v. Huerta*).

Sec. 2130 establishes an aeronautical knowledge and safety test that individual operators, with some exceptions, will be required to pass in order to operate a sUAS. The text mandates that the FAA construct that test, along with other stakeholders in industry and “community-based aviation groups,” no later than 180 days after the passage of the FAA Reauthorization Act.

Sec. 2131 exempts UASs operating underground for mining purposes from the authorities of the FAA.

Sec. 2132 establishes “a program to utilize available remote detection and identification technologies for safety oversight, including enforcement actions against operators of [UASs] that are not in compliance with applicable Federal aviation laws, including regulations.” In addition, it establishes a reporting mechanism by which the public and law enforcement agencies may register suspected cases of abuse. In order to actualize this regime, the text calls for a \$5 million appropriation budget for fiscal years 2018 through 2021.

Sec. 2133 mandates that the FAA Administrator, in conjunction with the Department of Homeland Security and “other relevant Federal departments and agencies,” develops “a plan for the certification, permitting, authorizing, or allowing of the deployment of technologies or systems for the detection and mitigation of [UAS]” within 180 days of the bill’s passage. To that end, the FAA Administrator is permitted to charter the creation of an aviation advisory committee to provide recommendations.

The UAS detection and mitigation systems are then to be deployed at 5 different airports, where they are permitted to be used “to detect and mitigate the unauthorized operation of an unmanned aircraft that poses a risk to airspace safety.” Upon the establishment of the aforementioned “plan,” airports may then apply for grants to purchase these systems. A report assessing the testing and implementation of these systems is then due to Congressional appropriators one year after the bill’s enactment, and is to be submitted in a classified format, with an unclassified section summary permitted if deemed “appropriate.”

This section is sunsetted on September 30, 2021.

Sec. 2134 amends the existing prohibition against use of UAS to “knowingly or recklessly” interfere in “wildfire suppression law enforcement, or emergency response” efforts to include “helicopter air rescue operations.”

Sec. 2135 amends the definition of “public aircraft” to include a UASs “owned and operated by or exclusively leased for at least 90 consecutive days by an Indian tribal government.”

Sec. 2136 mandates that the FAA Administrator, within one year of the bill’s enactment, issues a rule that authorizes the commercial “carriage of property by operators of [sUAS].” That rule is to include provisions for sUAS air carrier certification, which take into account the “safety risks and the mitigation of those risks associated with the operation of highly automated, small unmanned aircraft around other manned and unmanned aircraft, and over persons and property on the ground.” It also includes sUAS air carrier classification provisions, which are limited to (1) registration with the Department of Transportation and (2) a valid sUAS air carrier certification, as previously outlined.

Sec. 2137 directs the FAA Administrator to establish a Collegiate Training Initiative program for sUAS studies that would “prepare students for careers involving [UASs].”

Sec. 2138 directs the FAA Administrator and Secretaries of Defense, Veterans Affairs, and Labor to consult on whether occupations related to UASs can be incorporated into the Veterans’ Employment Program.

Sec. 2139 directs the FAA Administrator, within one year of the bill’s enactment, to submit a report to the appropriate congressional committees on which aviation safety requirements ought to apply to sUASs “engaged in aerial spraying of chemicals for agricultural purposes.”

Sec. 2140 directs the FAA Administrator, within 30 days of the bill’s enactment, to publish “a representative sample of the safety justifications offered by applicants for waivers or air traffic control authorizations that have been approved by the Administration for each regulation waived or class of airspace authorized.” Proprietary information is exempted from this requirement.

Sec. 2141 is a redesignation of various acts and amendments throughout the U.S. Federal Code.

Analysis

The most detailed portion of Part II is the text of **Sec. 2123**, which essentially begins the process of developing a more comprehensive set of safety standards for incorporating UASs into the national airspace. The aviation advisory committee is charged with producing risk- and consensus-based safety standards. Importantly, part of their mandate is to take account of technologies like “sense-and-avoid,”

which is a heartening development for potentially lifting restrictions on BVLOS flight—a necessary first step to open the door to commercial drone deliveries. The section also makes it a point to include cost-benefit analysis as the methodological means for evaluating proposed safety standards. This is an important element of the text’s language, as cost-benefit analysis implies a very particular and comprehensive approach to evaluation that is all-too-often disregarded in the rulemaking process. In general, the multistakeholder approach to crafting these standards is a positive component of the legislation.

While the FAA’s procedural application of these safety standards means sUASs do not require additional airworthiness certification standards or type approvals, there is no guarantee that the FAA will meet its statutorily-defined 180 day window for defining the procedure for approval. Meeting legislative deadlines for UAS rulemaking has been an ongoing problem for the FAA, as evidenced by its consistent failure to meet deadlines imposed on it by the FAA Modernization and Reform Act of 2012. Although the legislatively-mandated development of these safety standards will result in regulatory certainty for the emerging drone industry, there’s no telling when that certainty may emerge. As a result, the legislative text ought to anticipate and provide remedies for the Agency’s potential failure to meet its deadlines, whether in the form of default-approval backstops or other means for disincentivizing foot-dragging.

Unfortunately, **Sec. 2125**, while providing for a special grant of authority to the Secretary of Transportation to approve UASs for airspace operations, may end up perversely incentivizing the FAA’s foot-dragging on promulgating safety standards. While the Agency is crafting those standards, the approval authority granted to the Secretary is a double-edged sword. The powers are temporary (which sunset on September 30, 2021) and it is clear that some interim approval authority is needed. However, the inclusion of these authorities could have the opposite effect, protracting the development and implementation of procedures for approving UASs. The inclusion of these authorities are another reason why some default-approval backstop or Agency penalties should be attached as a provision of **Sec. 2124**.

The sense of Congress outlined in **Sec. 2126** should be well-received. It recognizes the potential economic impact of automated commercial UAS operations and seems to understand that such a system necessitates remedying restrictions on BVLOS, nighttime operations, and flights over individuals not directly involved in the operation of UASs. Unfortunately, there is no provision in the bill that mandated the FAA Administrator initiate a rulemaking in order to address those stringent regulations currently in place.

The permissiveness afforded recreational users of sUASs under **Sec. 2128** is commendable, and the savings clause is a welcome restraint on FAA authorities over hobbyists. However, the provision that restricts BVLOS operations fails to account for virtual and augmented reality (VR/AR) technologies that can actually *enhance* the ability of operators to fly in accordance with safety guidelines. As with commercial operations, the text should permit the use of VR/AR technologies for recreational drone flights by default, with exceptions provided based on particularly sensitive flight zones or under narrow circumstances.

Developing UAS detection and mitigation systems seems like a wise step, and the report to be issued by the text of **Sec. 2133** can likely assist in furthering the deployment of such technologies at airports across the country. However, that the report is to be classified by default is potentially concerning. It is also concerning that an unclassified version is not mandated to be included, but left to the judgement of the FAA and DHS. While it is understandable that some of the technical specifications of these systems are rightly kept under lock-and-key for fear of exploitation by bad actors, it is important for industry and members of the research community to understand what technologies work most effectively in deterring or detecting UASs in the airspace. Such technologies are likely to be an integral part of a broader UAS air traffic management system, and can help clarify whether government funding for certain technologies is actually worth the financial costs. As such, an unclassified report or summary should be mandated as part of the reporting requirement.

The property carriage component of **Sec. 2136** is an important step forward in moving to a regulatory regime that can apply certainty to the budding drone delivery services still under development by firms like Amazon. Like the other sections of Part II, however, there is no guarantee that the FAA will ensure a timely completion of these rules. In order to ensure that these procedures are constructed within the legislative timeline, the text of each of these sections (SECTION #s) ought to include either (1) a default-approval backstop (such as the one included in **Sec. 2153**, discussed later) or (2) some other statutory mechanism that incentivizes FAA to complete its task within the defined time period (or penalizes it for failing to do so).

Part III: Other Matters

Sec. 2151 directs the Comptroller General to conduct a study, and issue a report to the appropriate congressional committees, “on the relative roles of the Federal Government and State and local governments in regulating the national airspace system, including [UAS] operations.” The contents of that study are to include an assessment of the current law with respect to non-federal authority over the national airspace, the potential gaps in authorities related to low-altitude flights of UASs, the effectiveness of the federal government’s efforts “to resolve differences between different stakeholders on the issue,” and recommendations for ways to restructure the roles between states and localities and the federal government on issues “arising from the use of [UASs].”

Sec. 2152 notes the use of spectrum as an important component of UAS operations. It charges the Administrators of the FAA, NTIA, and FCC to deliver a report, within 270 days of the bill’s enactment, to the appropriate congressional committees that assesses: (1) whether sUAS operations should operate on spectrum that is aviation-specific on unlicensed/shared/exclusive bands in a UAS air traffic management system, or “outside of such a system;” (2) barriers to the use of spectrum; and (3) recommendations for appropriate spectrum frequencies, if those dedicated for aviation use are found to be inadequate for sUAS purposes.

Sec. 2153 directs the FAA Administrator, within 270 days of the bill’s enactment, to establish standards and procedures to facilitate the use of UASs by academic institutions. Those standards shall allow for

post-approval iterative modifications without the need for additional approvals from the FAA Administrator.

If the FAA Administrator fails to issue those standards and procedures by the 270 day deadline, an institution of higher education is permitted to “operate small unmanned aircraft at model aircraft fields approved by the Academy of Model Aeronautics and with the permission of the local club of the Academy of Model Aeronautics.” They may also submit to the FAA an application for designation of “1 or more outdoor flight fields,” which the FAA shall have to approve. If the FAA Administrator fails to respond to a flight field designation application within 30 days, the approval is granted by default.

Sec. 2154 lists a number of laws that are to “continue in effect.” They primarily include provisions of the FAA Modernization and Reform Act of 2012,² specifically sections 332(c),³ 332(d),⁴ 333,⁵ 334,⁶ and 336.⁷

Analysis

The reporting requirement looking at the current landscape of authorities over the national airspace is a good idea. It resembles the privacy law analysis required of the Comptroller General in Part I, but goes further by requiring an assessment of the efficacy of ongoing multistakeholder efforts to reconcile competing stakeholders’ interests on this issue. That report could also provide tangential benefits in providing insight into the general value of multistakeholderism as it relates to emerging technology regulatory governance. Similarly, the reporting requirement that looks at the spectrum issues related to UASs can also shed light on how the government and firms intend to address air traffic management control for automated UASs.

The provisions for permitting access to, and use of, UASs by academic institutions is also a good step. Importantly, **Sec. 2153** recognizes the potential for the FAA to fail to meet its obligations to establish the necessary standards and procedure(s) to permit academic use of UASs. As a result, it includes a backdoor default approval provision should the FAA fail to respond to applications for designated flight fields within a limited window of time. Although this is a positive development, it is unfortunate the bill does not make similar allowances under Part II as it relates to commercial UAS operations.

² Available here at https://www.faa.gov/uas/media/Sec_331_336_UAS.pdf.

³ Section 332(c) is the provision that establishes test ranges for the purposes of integrating UASs into the national airspace.

⁴ Section 332(d) expands the use of UASs in the arctic.

⁵ Section 333 permits the Secretary of Transportation the interim authority to approve which types of UASs may be approved for operation in the national airspace, provided they “do not create a hazard to users of the national airspace system or the public or pose a threat to national security.” It also provides the authority for the Secretary to determine whether and what type of certifications are required for those UASs to operate in the national airspace.

⁶ Section 334 established deadlines and authorities for the Secretary to “issue guidance regarding the operation of public unmanned aircraft systems.” It establishes many of the same restriction as those currently imposed on commercial operators, including limiting operations to VLOS, daytime hours, and under 400 feet.

⁷ Section 336 prohibits the FAA Administrator from promulgating rules or regulations governing the use and operation of UASs for hobbyist or recreational purposes.

The continuation-in-effect of various sections of the FAA Modernization and Reform Act of 2012 under **Sec. 2154** are slightly confusing. The continuation of Section 336 seems inoffensive, given that it retains prohibitions on the Secretary of Transportation’s rulemaking authorities for recreational UAS use, with limited exceptions. However, the continuation of Sections 333 and 334 seem unnecessary, given the newly established authorities and procedures mandated by Part II.

Part IV: Operator Safety

Sec. 2161 titles this portion of the bill as the “Drone Operator Safety Act.”

Sec. 2162 outlines a sense of Congress that extolls the value of prioritizing public education efforts for UAS operators.

Sec. 2163 establishes penalties for the unsafe operations of UASs. It also applies penalties to operators who fly within the confines of a “runway exclusion zone” (defined in the section), unless they receive prior approval from the air traffic control facility, or the operation was the result of an unanticipated event that could not have been “reasonably foreseen or prevented.”

Analysis

Part IV is almost entirely uncontroversial. Although the penalties for individuals violating provisions of **Sec. 2163** may sound severe, they require that the operator knowingly violates them. The exceptions provided for unforeseeable and unanticipated occurrences are perfectly reasonable and protect operators from the harshest penalties if they are operating a UAS in a responsible manner.

Conclusion

The overall text of Title II, Subtitle A of the FAA Reauthorization Act of 2017 is a step in the right direction for establishing clear and minimally burdensome rules for commercial UAS operations in the domestic airspace. Improvements can primarily come in the form of provisions that penalize or otherwise incentivize the FAA to adhere to the deadlines included in the bill’s language. The best legislative text is only as good as the institutional ability (and intent) to implement its provisions. If Congress is serious about the provisions outlined in Title II, Subtitle A of this bill, it needs to ensure much stronger means for ensuring the FAA is held to the deadlines in the text.