601 Pennsylvania Ave NW, Suite 250
Washington, D.C. 20004

T. 202-737-7950

www.aopa.org

October 3, 2025

Docket Operations, M-30
U.S. Department of Transportation (DOT)
1200 New Jersey Avenue SE
Room W12-140, West Building Ground Floor
Washington, DC 20590-0001

Re: ***FAA Docket FAA-2025-1908 - Normalizing Unmanned Aircraft Systems Beyond Visual Line of Sight Operations***

To Whom it May Concern,

The Aircraft Owners and Pilots Association (AOPA) is the world's largest aviation membership association representing 300,000 individuals who pilot and own general aviation aircraft in the United States, including tens of thousands of members who fly drones. AOPA respectfully submits the following comments in response to the FAA's Notice of Proposed Rulemaking (NPRM) designed to normalize drone operations beyond visual line of sight (BVLOS).

Alongside AOPA's own comments, we have included a Manned Aviation Statement of Alignment, signed by a coalition of aviation organizations, at the bottom of this document.

Introduction

Since 1939, AOPA's mission has been to protect the freedom to fly while keeping aviation safe and affordable. AOPA's mission is to serve the interests of general aviation owners and operators and we support the development and safe integration of drones into the National Airspace System. BVLOS will undoubtedly bring commercial, humanitarian, and public safety benefits but it must be done in a manner that is safe and that accommodates manned aircraft operations.

AOPA cannot emphasize enough the critical interests of the manned community in a regulatory action of this magnitude. General aviation plays an enormous role in the nation's transportation infrastructure, enabling air transportation and commerce in many locations not served by commercial aviation. In addition, there are over 600,000 general aviation pilots in the US, operating over 200,000 registered aircraft, not including many smaller, recreational aircraft. All of this generates more than $339.2 billion in economic activity each year and supports 1.3 million jobs.

AOPA has been involved in promoting the safe integration of BVLOS drones into the NAS for several years and was an active participant in the 2022 BVLOS Aviation Rulemaking Committee (ARC). Following the conclusion of that ARC, AOPA and others in the manned aviation community submitted non-concurring comments, expressing opposition to several radical recommendations put forward by the drone community. We will reiterate those concerns below.

Unfortunately, despite the manned aviation community's willingness to reach consensus and our statements of non-concurrence, the FAA incorporated many of the ARC's recommendations into this NPRM and, as a result, AOPA has a series of additional concerns and questions.

While AOPA supports the integration of drones into the NAS and appreciates that the FAA has many priorities spanning a variety of NAS operators., we believe the Agency's priorities should be directed toward the concerns of those industry segments that actually contribute to the Aviation Trust Fund.

AOPA's Non-concur Comments to the BVLOS ARC Report

In our non-concur comments from March of 2022[1], AOPA expressed several concerns pertaining to the unsafe burden and unfeasible requirements that changes to right-of-way (ROW) rules would place upon crewed aircraft. Many in the manned community expressed similar concerns.

First, utilizing the flawed "big sky" theory, which posits that very few aircraft operate at low altitudes or within shielded areas, the ARC minimized the risk of collisions at low altitude and within shielded areas. This is a demonstrably inaccurate assumption, and disappointing that the FAA continues to advance this as a rationale for its BVLOS NPRM.

The ARC's flawed logic proposed that BVLOS drones would have "1) complete right-of-way over all crewed aircraft not equipped with either ADS-B or Traffic Awareness Beacon System (TABS), and 2) right-of-way over all crewed aircraft that are operating in what is being proposed as 'shielded areas'." AOPA noted at the time that these radical recommendations fail to recognize the realities of aircraft operating at low altitudes." We continue to note the continued misunderstanding of how many manned aircraft, both fixed wing and vertical lift, operate at low altitudes in the NPRM.

Second, AOPA expressed concerns about the ARC's "unsafe and unfeasible reliance on electronic conspicuity" (EC) as a means of providing collision avoidance and about its recommendation to base ROW rules upon its use. We highlighted the unreliability of ADS-B at low altitude and the confusion that will ensue if the current aircraft maneuverability basis for ROW rules is removed and replaced with something based upon ADS-B or TABS equipage.

AOPA also provided a pair of solutions in our non-concur comments to the ARC report:

1. "AOPA recommends the FAA require uncrewed aircraft have some form of detect and avoid capability (e.g., onboard, ground, hybrid, etc.) for BVLOS operations that meets FAA performance requirements (in conjunction with industry consensus standards) to meet a shared responsibility to see (detect) and avoid other aircraft (both crewed and uncrewed)."
2. "AOPA recommends maintaining right-of-way rules based on maneuverability, with no blanket right-of-way rules for BVLOS drones over crewed aircraft without ADS-B or TABS equipment, nor over crewed aircraft operating in the proposed definition of 'shielded areas.'"

The NPRM proposes that BVLOS drones possess some form of detect and avoid capability to meet the shared responsibility for see (detect) and avoid other aircraft. However, a BVLOS drone maintains the ROW unless the manned aircraft equips with ADS-B Out or EC (so that drones can "see" them) or unless the manned aircraft is

[1] APPENDIX_F-Combined_Voting_Ballots_03242022.pdf

operating in a Category 5 population density area, Class B or C airspace, or departing/arriving at an airport or heliport.

Further, while the NPRM does lay out several situations where crewed aircraft would retain ROW, there remains the underlying premise that, in general, BVLOS drones will have ROW unless certain conditions are met. Additionally, it grants BVLOS drones complete ROW within shielded areas.

Finally, AOPA's non-concur comments to the ARC report asserted that "The BVLOS ARC recommendations and report fails to recognize and accurately capture the opinions of its members." We noted that ".. AOPA (along with other ARC members) have raised concerns regarding the process of recording, adjudicating, and accurately characterizing the opinions of the ARC membership, and transparency of ARC leadership decisions."

The ARC's industry leadership team consisted solely of representatives from the drone community and the input and recommendations from the manned aviation community were routinely minimized or dismissed entirely. It is notable that the manned aviation community objected to the ensuing report.

Again, it is very discouraging that the NPRM is based on an ARC that was so widely panned and which drew universal non-concurs from the manned aviation community.

Areas of Agreement with the NPRM

As noted above, AOPA shares the desire to safely and equitably integrate BVLOS drone operations into the NAS, along with other new entrants like VTOL aircraft and commercial space operations. We recognize the benefits to society that these new technologies will enable and are eager to work alongside each respective community to bring their plans to fruition.

We agree that BVLOS operations need to be normalized and governed by a codified set of rules, rather than being enabled on a limited basis by use of letters of agreement (LOAs) and waivers. While we have concerns, as laid out below, we believe the NPRM is a starting point to that end.

We applaud the FAA's desire to "think outside of the box" in finding solutions to the complex issues arising from the deconfliction of manned and unmanned aircraft at low altitudes. The introduction and development of strategic deconfliction and various types of detect and avoid (DAA) technology will be key to the success of this integration and AOPA fully supports these efforts.

Specifically, as noted later in these comments, AOPA is very much supportive of the development of EC technology and agrees that it, alongside ADS-B, will play a significant role going forward in assisting with the deconfliction of manned and unmanned aircraft. We are eager to see the FAA advance the appropriate specifications for EC that will enable it to be made available to the manned aviation community as a safety enhancement.

Areas of Concern With the NPRM

Basing ROW rules upon equipage rather than aircraft maneuverability

The most significant area of concern that AOPA has with the NPRM pertains to the proposed changes to long-standing ROW rules that have, for decades, been based upon aircraft maneuverability.

We find it troubling that the FAA elected, in its proposed updated language for §91.113, to grant drones, operating under Part 108, ROW over other aircraft in flight unless those other aircraft meet a set of criteria. Drones, whether operating under Part 108 or not, are generally very maneuverable, with many having the ability to stop and hover in flight or abruptly alter their lateral and vertical motion to a much greater degree than virtually any other type of aircraft.

To grant these aircraft ROW over other aircraft that are arguably less maneuverable appears to dismiss the fundamental realities of how aircraft interact with one another.

Additionally, the language of the proposed §91.113(h) is written in such a way as to apparently place it in contradiction with the broader context of §91.113 (a) through (g). More specifically, while not stated as such, it appears that most of paragraph (h) would supersede paragraphs (a) through (g).

Presumably, this is due to the challenges involved with BVLOS drones participating in the shared responsibility to see and avoid other aircraft, which will be discussed later in these comments. It is both surprising and disappointing that the FAA would propose such a radical departure from traffic deconfliction norms simply because it is too difficult or expensive for BVLOS drone operators to equip themselves in such a way as to take on the same shared responsibility that all other aircraft operators assume.

The resulting proposal for a new ROW scheme is fraught with ambiguity and operational unrealities, as laid out in these comments.

AOPA believes that the FAA must alter its proposal and maintain the existing, far more reasonable, and safer ROW hierarchy based upon aircraft maneuverability for all manned aircraft, emphasizing that all NAS operators must accept their shared responsibility to detect and avoid all other aircraft. While we agree with FAA's assertion that ADS-B and EC have a significant role to play in making this easier for BVLOS drone operators, we do not agree that equipage with such devices should be the basis for determining ROW.

Manned aircraft ceding right-of-way to BVLOS drones

AOPA has concerns about the FAA's proposal that non-conspicuous manned aircraft would cede ROW to BVLOS drones in certain airspace, unless equipped with ADS-B Out or EC.

One concern from this is that it would seem to discard existing research illustrating the limited ability that pilots of manned aircraft have to see and avoid small drones at low altitude.

Embry Riddle Aeronautical University conducted a study in 2017[2] that examined manned aircraft operating between 60kts and 160kts in airport terminal areas to determine the human ability to see and avoid small UAS. The report included the following summary statement:

> The results of the analysis suggest the probability of detection, in all cases modeled during the study, is far less than 50 percent. The probability of detection was well under 10 percent for small UAS aircraft similar to the products used by many recreational and hobby operators.

Based on this, for those aircraft not equipped with conspicuity technology and thus losing ROW, it is unreasonable to make the assumption that these pilots will be able to see and avoid small drones. Further, it is

[2] https://assureuas.com/wp-content/uploads/2022/03/ERAU-External-Research.pdf

very concerning that, in certain situations, a drone with no humans on board would have ROW over aircraft that are carrying humans. This appears to exhibit a profound disregard for the safety of pilots and passengers, placing the enablement of drone operations over the safety of human lives.

We acknowledge that there will likely be unmanned (defined here as unpiloted) aircraft carrying humans in the near future. However, these aircraft will likely be of sufficient size and complexity so as to carry advanced DAA technology, are expected to be far more visible to other pilots than small drones, and are not expected to operate under Part 108. We would envision these aircraft operating much like manned aircraft and, therefore, subject to the existing maneuverability-based ROW hierarchy.

AOPA believes that unmanned aircraft should never have ROW over a manned aircraft, with a few very limited exceptions involving near-surface operations (i.e. drones hovering on-station performing inspections) or, if carrying passengers, when appropriate based upon existing §91.113 ROW rules.

Equipage and right-of-way in Class B and C airspace

BVLOS drone equipage concerns

The NPRM does allow manned aircraft to retain ROW, but only in certain airspace. Part 108.180(b) states:

> Unless otherwise authorized by the Administrator, no operator may operate an unmanned aircraft under this part in Class B or C airspace unless the unmanned aircraft system is able to detect and avoid an aircraft not broadcasting its location in accordance with the requirements of §108.195(a)(2) or §91.225 of this chapter.

AOPA applauds this provision, as it acknowledges a fundamental concern we have raised for several years. While the usage of ADS-B Out and EC are beneficial in assisting BVLOS drones in their deconfliction with manned aircraft, it is unwise to rely solely upon this technology for that purpose. ADS-B equipment does fail and has been shown to be less reliable at low altitude due to terrain and obstructions affecting ADS-B signal between aircraft and ground stations.

Additionally, it is likely that BVLOS drones will encounter manned aircraft in Class B and C airspace that have either encountered a failure or are operating under a letter of agreement (LOA). Hence, we believe it to be appropriate that these drones have the capability of detecting and avoiding all manned aircraft.

We are puzzled, however, by the FAA's decision to limit this requirement to Class B and C airspace. In Chapter VI, Section G of the preamble language (addressing §108.180), the FAA states the following:

> In addition, FAA proposes additional requirements to operate in Class B and C under proposed part 108. The largest concentration of manned aircraft operating at low altitude within the vicinity of an airport occurs within Class B and C airspace. As a result, FAA considers there to be a higher risk of a collision in this airspace. To mitigate this risk, FAA proposes to require UA operating in Class B or C airspace to be equipped with a DAA system that meets the requirements in §§ 108.825 and 108.195. FAA also proposes to require UA operating in Class B or C airspace to detect and avoid manned aircraft that are not broadcasting their position via ADS-B or an electric conspicuity device. FAA recognizes that most aircraft operating in Class B or C airspace are otherwise required to broadcast their position via ADS-B or an electronic conspicuity device. Nonetheless, under certain circumstances, aircraft could be operating in this space without ADS-B or an electronic conspicuity device. For example, an aircraft could be experiencing an equipment failure or could have received authorization from ATC to deviate from these

> requirements. FAA seeks comment on whether these requirements are appropriate mitigations to address the risk of collision with manned operations in this airspace and any information that provides more insight into if, and to what extent, operations with ADS-B Out turned off happen in controlled airspace below 500 feet.

While we agree that the risk of a collision between any aircraft is demonstrably higher in the vicinity of airports, we would note that many of the busiest airports frequented by general aviation aircraft fall outside of Class B and C airspace (although we understand that, under the proposed new rules, traffic around airports/heliports in general would retain ROW due to the proposed §91.113 (h)(3)).

Additionally, this rationale continues the false narrative that there are very few manned aircraft operating below 500 feet AGL. There are a great number of manned aircraft that operate away from airports/heliports, conducting functions such as emergency services, infrastructure inspection, agricultural application, backcountry flying, seaplane operations, among others.

Hence, AOPA questions the FAA's conclusion that there is a lower risk of collision between non-conspicuous aircraft and drones in Class D, E, and G airspace. Even if it can be statistically shown that the risk is lower, a substantial risk still exists and must be addressed.

Additionally, manned aircraft flying inside Class B and C airspace are far more likely to have equipped with ADS-B Out due to the current requirements in §91.225. We agree that these aircraft can see failures of their ADS-B Out equipment, as noted above, and that BVLOS drones must have the ability to detect and avoid them.

However, it is arguably just as likely that BVLOS drones will encounter non-conspicuous aircraft in Class D, E, and G airspace, where there is no ADS-B Out mandate and where there is a higher concentration of certain low altitude general aviation operations (i.e. agricultural, backcountry, seaplane, ultralight, lighter-than-air, etc). While it is hoped that many of these aircraft will equip with EC, it can be assumed that some will not – or that, as in B and C airspace, they might encounter equipment failures.

There also appears to be a reluctance by the FAA to institute a requirement for BVLOS drones to possess DAA capability, sufficient for deconfliction with both conspicuous and non-conspicuous aircraft, in wider airspace due to the cost burden that would be placed upon the new entrant. While AOPA can appreciate the impact this might have upon drone operators, expensive equipage requirements are sometimes an unfortunate reality of operating in the NAS. Over the past several decades, manned aircraft have been subject to numerous such requirements, many of which have been expensive.

In this instance, we believe that it is reasonable for the drone community to bear this cost, considering the type and impact of operations they wish to conduct and due to their position as the new entrant to the NAS.

Finally, as noted above, manned aircraft operators contribute a substantial amount of fees and taxes annually into the Aviation Trust Fund. To date, the drone community has not been required to do so and, while likely outside the scope of this NPRM, AOPA believes this must be addressed. Regardless, we do not believe the cost burden for deconfliction should rest upon manned aviation but should instead rest upon the new entrant.

AOPA believes the FAA must extend the BVLOS drone DAA requirement for detect and avoid capabilities of both conspicuous and non-conspicuous aircraft, to all airspace, not only Class B and Class C.

Right-of-way concerns

AOPA also has concerns about the rationale behind granting ROW to manned aircraft in Class B and C airspace, but not in D/E/G airspace. In the proposed §91.113(h), the NPRM states:

> (h) *Unmanned aircraft.* An unmanned aircraft conducting operations under part 108 of this chapter has the right-of-way over other aircraft in flight unless—
> …
> (2) That aircraft is operating in Class B or C airspace as described in §108.180(b) of this chapter;

Chapter VI, Section J of the preamble language (addressing §108.195) does not provide much in the way of insight behind this rationale, but it appears to be based on the presumptions that there are not as many aircraft operating at low altitudes outside of Class B and C airspace and that the majority of BVLOS operations will occur inside Class B and C.

While we cannot speak to the expected concentration of BVLOS drones within certain airspace, we do reiterate our opposition to the "big sky" theory (mentioned earlier) which posits that there are not many manned aircraft operating below 500 feet AGL. We suspect other organizations will provide ample evidence to the contrary, as there are a great many low-altitude operations, including agricultural, recreational, law enforcement, and utility inspection aircraft – especially in Class D, E, and G airspace.

Finally, there appears to be a disconnect between §108.180(a)(2)(b) and §108.195(a). §108.180(a)(2)(b) makes reference to the requirement for BVLOS drones operating in Class B and C airspace to be capable of detecting and avoiding non-conspicuous aircraft. While not explicitly stated in that section, the inference is that BVLOS drones would cede ROW to all manned aircraft in that airspace.

However, in §108.195(a), there is no mention of Class B and C airspace (nor of population density areas, discussed below). This discontinuity is confusing and needs to be clarified.

AOPA is supportive of granting ROW to manned aircraft in Class B and C airspace and believes the FAA must extend this ROW to Class D, E, and G airspace as well.

Right-of-way over certain population density areas

The NPRM introduces the concept of population density areas (PDAs) and asserts that drones will have ROW in areas other than Category 5 PDAs. While the preamble language describes PDAs as a mitigation designed to protect people and property on the ground – presumably from falling debris that would result from a collision between aircraft or from some other malfunction - it is unclear, from an aviation safety perspective, what relevance population density (how many people are on the ground) has to which aircraft flying over the area has ROW. If the concern about collisions between manned aircraft and drones grows this much from one category of PDA to another, perhaps the overall rationale for deconfliction should be reconsidered.

It is unclear why manned aircraft having ROW over drones in category 5 PDAs would provide a higher level of safety for people and property on the ground, while at the same time, drones having the ROW over manned aircraft in PDA categories 1 through 4 would supposedly do the same. This rationale also begs the question as to why category 5 PDAs were selected for special distinction. Why not, for example, draw the distinction at category 3 PDAs, since that is the highest category where delivery drones are permitted to operate (per §108.440)?

The distinction as laid out in the NPRM appears to be artificial. AOPA would suggest that the better calculation would be which ROW hierarchy provides a higher degree of safety for manned aircraft – regardless of which PDA the operations are occurring in.

We also believe that the FAA needs to provide more information about how pilots will know what category of PDA they are flying over at any given time and how these areas will be charted or otherwise be made known to pilots. With issues such as charting clutter and FAA Aeronautical Information (AIS) workload being areas of current concern within the agency, introducing another layer of airspace information to charting products is likely to result in pilot confusion and raises questions about whether AIS can support such an endeavor.

On a related note, we have concerns that the use of PDAs could introduce a high level of operational confusion for pilots. Since PDAs are not laid out in easily identifiable or predictable areas, it is conceivable that a pilot could be flying through one category of PDA one moment and another category the next – perhaps without even realizing it. This means that, in an instant, the ROW rules would change for that pilot. The resulting ambiguity from this fluid set of rules would introduce profound safety concerns.

AOPA believes the FAA needs to provide much more information about the rationale behind, and practical application of, PDAs. Further, as noted earlier, we believe manned aircraft should retain ROW in all airspace, meaning that we question the need for PDAs to be utilized at all.

Right-of-way in shielded areas

While §108.195 and §108.205 do not explicitly state that BVLOS drones will have the ROW over manned aircraft in shielded areas, the preamble language does. Further, it appears that BVLOS drones would have ROW in these areas even if the manned aircraft are transmitting ADS-B Out or EC. We find this proposition to be very concerning.

As mentioned throughout these comments, AOPA does not accept the FAA's assumption that very few aircraft operate below 500 feet AGL. This thinking was raised during the BVLOS ARC by the drone community, leading the manned aviation community to push back on it at that time. Subsequently, while evidence of the frequency of manned aircraft operations at these low altitudes has been provided by many, including the agricultural aircraft and rotary-wing communities, the FAA appears to have chosen to minimize or ignore this evidence.

Further, we do not agree that drones should ever have the ROW over manned aircraft, with a very limited set of exceptions. As noted earlier, pilots operating aircraft at low altitude have a very limited ability to see small drones, have a very short period of time to react even if the drone is seen, and have very few options to avoid a collision due to proximity of terrain and obstructions. Additionally, manned aircraft operating within shielded areas typically have a relatively small amount of mass, making an encounter with a drone more likely to result in flight-critical damage to the manned aircraft.

While we do not believe that the FAA should advance its current approach to shielded areas, we believe that, at the very least, those manned aircraft operating in shielded areas, which are equipped with and utilizing ADS-B Out or EC, must retain the ROW over BVLOS drones.

As noted earlier, AOPA can envision some limited exceptions to this, for example, a BVLOS drone might be conducting on-station operations in a hover. In circumstances like these, allowing the drone to have ROW over manned aircraft that may be transiting the area may make sense, as it would be more reasonable for the

manned aircraft to move out of the way – assuming the drone can be seen. Thus, in these instances, we believe there would need to be additional requirements in place to ensure the drone is highly visible.

AOPA believes that the FAA must alter the NPRM to remove §108.205 and make changes to §108.195 as needed to ensure that manned aircraft always have the ROW within shielded areas (except in limited circumstances as described above).

Imprecise definitions of airport/heliport arrivals and departures

The NPRM states in §108.195(a) that BVLOS drones would be required to yield ROW to all aircraft departing from or arriving at an airport or heliport. However, this requirement raises a series of questions.

First, the NPRM fails to specify which aerodromes are included in this requirement. It would be reasonable to presume that the FAA is referring to all public airports/heliports. However, would this requirement also include private ones or areas that are otherwise designated as landing sites?

There are many operators who routinely conduct takeoff or landing operations at locations other than airports/heliports. It seems reasonable that these aircraft should be afforded the same level of protection during these critical phases of flight as those operating at airports/heliports.

Second, we believe more clarity is needed as to the definitions of "departures" and "arrivals". In this context, at what point in an aircraft's operation does the departure terminate or the arrival commence? It does not seem reasonable that a manned aircraft would have ROW during a departure from an airport/heliport but subsequently lose it once it reaches some vaguely defined point in their flight (or the reverse for arrivals).

Finally, this requirement was presumably created to protect manned aircraft at low altitude during landing and departure operations. However, we fail to understand the distinction between the need to protect these aircraft and other aircraft that are operating at low altitude but not landing or departing. The risk of a manned aircraft encountering a drone is still there, regardless of airspace class and proximity to airports/heliports.

AOPA believes the FAA must consider the large number of manned aircraft that operate at low altitude, away from airports/heliports. Further, we believe manned aircraft must retain ROW over drones, not only when arriving at or departing from airports/heliports, but in all airspace.

Shared responsibility for see/detect and avoid

A basic premise among all aircraft operators is the shared responsibility to see/detect and avoid other air traffic. GA pilots bear this responsibility, as do all pilots of manned aircraft. There are no limitations on this based on the equipage of those other aircraft. Pilots of manned aircraft are responsible to see and avoid anything ranging from hot air balloons and ultralight aircraft to high-speed turbojet aircraft. AOPA contends that any operator seeking to operate BVLOS drones in the NAS must be able to demonstrate the same capability.

As noted throughout these comments, AOPA believes that BVLOS drones must have the ability to detect and avoid all manned aircraft, regardless of equipage and conspicuity. While the NPRM acknowledges this need and requires BVLOS drones to have this capability in Class B and C airspace, we believe the need exists, perhaps to an even greater degree, in Class D, E, and G airspace.

There have been statements made by some in the UAS community that drones can only detect and avoid aircraft that they can see. AOPA agrees! Given that, for a variety of reasons, there will always be manned aircraft

that are not emitting some form of electronic conspicuity, it is therefore incumbent on drone operators to ensure they are able to detect and avoid these aircraft.

At least 17,000 manned aircraft operate in the US without electrical systems, rendering them incapable of equipping with ADS-B Out. Many of those that can and do operate with ADS-B Out can attest to the fact that ADS-B is unreliable at low altitudes. Portable, low-power ADS-B Out devices (EC), which will be discussed later in these comments, are supported by AOPA - but neither these nor certified ADS-B Out devices are insufficient to serve as a stand-alone traffic deconfliction mechanism. This is why AOPA believes EC and ADS-B Out should be just one layer in a multi-layered approach to deconfliction.

The alternative suggested by some in the drone community, and put forth in the NPRM, is to force these non-conspicuous manned aircraft to assume sole responsibility to see and avoid drones, which is not only counter to current FAA regulations, but blatantly unsafe. Pilots of manned aircraft accept their shared responsibility to see and avoid other aircraft (including drones) and are responsible for exercising vigilance to the best of their ability. However, the reality is that, as noted earlier, it is virtually impossible for a human pilot to see a small UAS in flight.

To absolve drones of their shared responsibility is an unreasonable and unsafe proposition. AOPA is aware of numerous instances where drones (some even utilizing ground observers) have come within feet of impacting manned aircraft, usually unseen by the human pilot until the last instant.

Conversely, AOPA asserts that drones flying BVLOS must possess capability, in some form, of detecting and avoiding non-conspicuous aircraft in all airspace. There are numerous DAA mechanisms, either already available or in development, that will allow BVLOS drones to accomplish this and dramatically improve safety.

To require GA aircraft to equip with conspicuity technology, which may or may not be reliable enough to serve as a stand-alone deconfliction mechanism, simply because DAA capabilities for drones are too expensive, too heavy, or too power-intensive, is stunningly inequitable and, again, unsafe.

AOPA believes the FAA must require operators seeking to operate drones BVLOS in the NAS to possess the capability to detect and avoid all manned aircraft, regardless of conspicuity, allowing them to participate in the shared responsibility to see/detect and avoid other air traffic.

The role of ADS-B and electronic conspicuity

AOPA support for EC

AOPA continues to be supportive of the development of low-power, portable ADS-B Out devices (referred to as EC in these comments) for use in the US. In fact, many operators, including those flying gliders, hot air balloons, and ultralight aircraft, have been requesting them for years due to a desire to make themselves more conspicuous.

We acknowledge that these devices are a significant improvement to aviation safety, providing another tool to increase situational awareness for aircraft operators. Additionally, we understand that they can make it easier for UAS operators to detect and avoid manned aircraft. AOPA envisions EC devices as a critical component of a multi-layered approach to deconfliction with BVLOS drones.

For all of these reasons, AOPA believes the FAA should accelerate their review of EC technology, as defined in §108.195, and provide avionics vendors with appropriate specifications to enable them to build and supply them for widespread use by GA pilots. Once this occurs, AOPA stands ready to assist in actively encouraging as many GA pilots as possible to equip with EC devices.

AOPA agrees that EC provides a significant improvement to aviation safety and adds one component to a multi-layered approach to traffic deconfliction. We believe that the FAA must complete its review of EC technology as quickly as possible, coordinating with industry on the development of device specifications sufficient to allow avionics vendors to design, build, and sell EC devices to the manned aviation community.

Timing and cost of EC devices

While, as noted above, AOPA is supportive of the development of EC, we do have concerns about the timing of the availability of these devices and with the expected costs that will be incurred by the manned aviation community. We understand the drone community has similar concerns with DAA equipment.

The development of EC specifications mentioned in the previous section will likely take many months of coordinated effort between the FAA, avionics vendors, and the manned aviation community. Once they are established, it will take even more time for EC devices to be available to pilots.

At the same time, the Part 108 final rule, which, based on this NPRM, will rely heavily on EC technology, is expected sometime in 2026. AOPA does not see any way for this NPRM to be fully implemented until EC is well defined and the technology is readily available.

Additionally, AOPA strongly disagrees that forcing one to equip their aircraft with EC in order to maintain ROW does not address the underlying safety concerns outlined above and appears to place enabling drone operations over the value of human life.

AOPA acknowledges that EC devices are going to play a significant role in a layered safety approach to the deconfliction of BVLOS drones and manned aircraft and that they otherwise generally enhance aviation safety. Thus, we believe that the FAA should explore some form of subsidy or rebate program to ease the burden of EC equipage on GA pilots. Much in the same way that the FAA's ADS-B Out rebate program assisted in increasing equipage by the GA community leading up to the 2020 ADS-B Out mandate, we believe a similar program would be an effective means to increase EC equipage.

AOPA believes the FAA must coordinate the publication of any final rule that relies upon EC with the development and availability of EC technology. Further, AOPA believes that the FAA should explore a means of subsidizing the purchase of EC devices by the manned aviation community.

Insufficiency of EC and ADS-B Out as a stand-alone deconfliction mechanism

As noted above, EC has long been sought after by the manned aviation community and is widely considered to be an enhancement to aviation safety. However, as noted earlier, EC and ADS-B Out technology is insufficient to be solely relied upon for detection and avoidance of manned aircraft by drone operators. Rather, it should be viewed as one part of a multi-layered approach to deconfliction.

As noted earlier in these comments, regardless of how broadly GA pilots equip with EC and ADS-B Out, there will always, for one reason or another, be those aircraft that are not conspicuous. Some pilots will choose not to equip, while others may experience technical malfunctions as FAA acknowledges in the NPRM.

The FAA has traditionally examined and provided for the safety of the "lowest common denominator" in manned aviation. Assuming that is still the FAA's philosophy, AOPA believes that the pilots and passengers of these non-conspicuous aircraft must be protected just as much as those who fly conspicuous aircraft. This means that there must be another layer of protection beyond what EC and ADS-B Out can provide. In our view, this can only be accomplished by BVLOS drones possessing some form of DAA capability that allows the detection and avoidance of non-conspicuous aircraft, again, in all airspace.

Unfortunately, many in the drone community, and now the FAA, assert that EC and ADS-B Out devices provide the sole solution to ensuring deconfliction with manned aircraft. Given the limitations noted above, AOPA believes this to be a faulty assumption.

AOPA believes the FAA must examine all DAA options for BVLOS drone operators that would provide collision avoidance between them and manned aircraft, focusing on the need to ensure that drones are capable of participating in their shared responsibility to detect and avoid all manned aircraft.

The importance of ADS-B In onboard BVLOS drones

Since the FAA has proposed that EC play a primary role in the deconfliction of manned aircraft and BVLOS drones, it is important to note the important role of ADS-B In capabilities for the drone operators. Indeed, while AOPA does not believe it should be the only means of providing that deconfliction, we do anticipate it will play a key, and likely an increasing, role in the future.

Some have suggested that ADS-B In receivers need not be installed on BVLOS drones and, in fact, there is no explicit requirement in the NPRM for BVLOS drones to be equipped with onboard ADS-B In. Rather, it has been suggested that BVLOS drones might have ADS-B In data, procured from ADS-B ground stations, transmitted along with telemetry between the ground-based drone operator and the drone itself.

However, since EC devices, as currently proposed, only communicate air-to-air with other aircraft, not with ADS-B ground stations, this presents a problem. ADS-B data coming from EC devices will need to reach the drones directly, not via ground station relays.

Hence, AOPA believes that the FAA must require BVLOS drones to possess onboard ADS-B In devices that will allow them to receive and utilize ADS-B Out data originating from EC devices.

AOPA believes the FAA must require that all BVLOS drones possess onboard ADS-B In receivers to enable them to receive and utilize ADS-B Out and EC signals directly from nearby aircraft.

Recent events

On October 1, 2025, it was reported that a pair of Amazon MK30 drones, each weighing over 50 pounds, crashed into a crane boom in Tolleson, AZ.[3] While there were no injuries, the resulting debris fell into two nearby parking lots.

AOPA very much understands the need to refrain from speculating on the cause of this event. However, we believe it does raise appropriate questions about the collision avoidance technology being utilized by drone operators in the context of this NPRM.

The fact that two drones crashed within minutes of each other, into the same obstacle, would seem to indicate that a systemic problem exists that must be examined and addressed.

Conclusion

AOPA reiterates its support for the integration of drones, including those operating BVLOS, into the NAS. However, it is critically important that this is done safely and equitably. Unfortunately, numerous items included in the NPRM are directly counter to this objective.

We maintain that all NAS operators must be capable of accepting and executing their shared responsibility to detect and avoid all other air traffic, regardless of conspicuity. We strongly believe the long-established ROW rules, based upon aircraft maneuverability must be maintained and that categorical ROW, for obvious safety reasons, never be granted to unmanned aircraft over manned aircraft.

We support the development of EC and will work toward attaining as broad a level of equipage as possible amongst manned aviation. However, we believe its role should be seen as only one layer of a multi-layered approach to traffic deconfliction.

Finally, due to the wide-ranging issues that are raised by several elements of this NPRM, we strongly recommend FAA integrate needed changes outlined in these and other comments into a supplemental NPRM. This approach would allow the FAA to have additional time to further coordinate with industry toward more workable solutions.

Thank you for reviewing our comments on this important issue. Please feel free to contact me at 202-509-9515 if you have any questions.

Sincerely,

Jim McClay
Director, Regulatory Affairs
Airspace, Air Traffic and Security

[3] Amazon pauses Prime Air after 2 drones crash in Tolleson, sources say

Manned Aviation Statement of Alignment Regarding Part 108

This document presents a unified statement from general aviation businesses and stakeholders outlining recommendations for ensuring the safe commercialization of drone technologies into the National Airspace System (NAS) through the FAA's Notice of Proposed Rulemaking (NPRM) for Normalizing Unmanned Aircraft Systems (UAS) for Beyond Visual Line of Sight (BVLOS) Operations ("Part 108").

As we scale and assert U.S. drone dominance[1], it is equally critical to maintain an existing aviation ecosystem that is the safest and most technologically advanced on the planet, recognizing the interests of existing airspace users. To further that mission, we highly suggest that FAA amend the proposed Part 108 rule in a way that mitigates safety gaps and ambiguities while also enhancing the existing operations that contribute greatly to the American way of life.

We are concerned the current rule as recommended by the FAA may contribute to unintended consequences for the NAS. We would be supportive of an additional NPRM being proposed as a supplement to the current proposal, taking into account the varied comments received by industry.

Right-of-Way (ROW) and Detect and Avoid (DAA) Requirements

The NPRM erroneously suggests that no manned aircraft operations can safely occur within 400 feet of a structure. **FAA must recognize the abundance of manned aircraft operating safely below 400 feet and near (within 50 ft of) infrastructure.**

The NPRM complicates ROW determinations and deviates from the maneuverability-based criteria in 91.113. **FAA must extend ROW to manned aircraft in all airspace, including shielded areas, requiring BVLOS drone operators to utilize DAA sufficient to avoid all manned aircraft, regardless of the airspace in which the operations occur. Making this change will allow FAA to simplify the proposed ROW rules, reducing the risk of mid-air collisions.**

The NPRM includes an inconsistent application of non-ADS-B based DAA requirements for BVLOS drones. Requiring non-ADS-B based DAA capabilities in Class B and C airspace, but removing the requirement in other airspace, could lead to unintended safety consequences. **FAA must extend the DAA requirement to BVLOS drones in all airspace.**

Electronic Conspicuity (EC) and ADS-B Requirements

The NPRM makes many references to EC and relies on this technology for DAA capabilities, but it fails to adequately define required specifications. Further, there is reasonable concern that the Part 108 final rule could be implemented before EC devices become widely available. **FAA must ensure the rapid development and approval of EC devices, providing detailed specifications for acceptable EC solutions to vendors and allowing the devices to be tested, proven, and widely available—potentially as part of a phased approach—prior to ADS-B Out/EC playing a role in DAA compliance and traffic deconfliction.**

The NPRM proposes that manned aircraft will need to equip with either ADS-B Out or EC in order to maintain ROW in all airspace. **We believe that manned aircraft must always maintain right of way over UAS.**

The NPRM does not explicitly state that BVLOS drones must have ADS-B In installed on-aircraft, despite its strong reliance on ADS-B and EC for DAA capabilities. **Due to low-altitude line-of-sight issues, FAA must require BVLOS drones to equip with ADS-B In onboard and integrate broadcast ADS-B data from other aircraft into traffic deconfliction systems.**

Airspace Access and Enforcement

The proposed rule lacks specific enforcement mechanisms for the 400-foot altitude limit for UAS and provides insufficient detail on Authorized Data Service Provider (ADSP) oversight and conflict-of-interest prevention. Additionally, the 100-foot buffer between 400-foot UAS operations and potential 500-foot manned aircraft operations is insufficient for safety, adverse weather, or emergencies. **FAA must establish robust ADSP auditing procedures with clear conflict-of-interest prohibitions and specific enforcement protocols for altitude violations.**

Data Transparency and Supporting Analysis

The NPRM was developed based upon a number of what FAA deemed "non-hazardous" determinations. **FAA should provide transparency and public access to comprehensive data on UAS operations and incidents that informed rule development. Additionally, FAA should provide an accessible database of authorized non-government based UAS BVLOS operations and operators for manned aircraft pilots to make informed flight path decisions.**

Clear educational materials distinguishing Part 107 and Part 108 requirements are also necessary. **FAA should consider how Part 108 concepts will be included in Airmen Certification Standards and provide guidance to current pilots.**

Other Considerations

- UAS Operations Supervisors, Flight Coordinators, and Maintenance Professionals: **FAA should require standardized licensing or certification of these personnel or identify a defined training standard with which all operators must adhere, to ensure a base level of knowledge and quality and to encourage trust within the pilot community.**
- Airport Definitions: **FAA must address the fact that the current airport definition (14 CFR § 1.1) creates challenges for geofencing around unlisted facilities, seaplane bases, and private airports. Additionally, an efficient reporting mechanism is needed for areas fitting the current airport 14 CFR §1.1 definition.**
- Regulatory Impact Assessment: **FAA should evaluate the NPRM in relation to existing regulatory burdens, not in isolation, as new BVLOS certificates will place a significant strain upon FAA personnel.**

Conclusion

The undersigned urge the FAA to address these critical safety concerns, ensuring that the integration of BVLOS operations prioritizes safety above all other considerations. We believe that further collaboration between FAA and industry stakeholders is crucial before finalizing this proposed rule.

Aircraft Owners and Pilots Association (AOPA)

Vertical Aviation International (VAI)

National Air Transportation Association (NATA)

Experimental Aircraft Association (EAA)

National Agricultural Aviation Association (NAAA)

Balloon Federation of America (BFA)

Alaska Airmen's Association (AAA)

United States Parachute Association (USPA)

Pilot Institute

United Aerial Firefighters Association (UAFA)