Date: September 29, 2026

To: Office of Information and Regulatory Affairs
Office of Management and Budget
Federal Aviation Administration

Subject: Read-Ahead for E.O. 12866 Meeting on the Final Rule for Normalizing Unmanned Aircraft Systems (UAS) Beyond Visual Line of Sight (BVLOS) Operations
RIN 2120-AL82 | Docket Number: FAA-2025-1908

Background and Purpose

The National Agricultural Aviation Association (NAAA) appreciates the opportunity to meet with OIRA and FAA regarding the above rulemaking. This document is provided in advance of that meeting so participants may review the supporting imagery, which cannot be presented on a voice-only call.

NAAA represents the interests of the 1,560 manned operators and 2,028 non-operator pilots conducting 14 CFR Part 137 aerial application operations throughout the United States. Our industry treats approximately 127 million acres of U.S. cropland annually, about 28 percent of all cropland in production, plus 5.1 million acres of forest land, 7.9 million acres of pasture and rangeland, and 4.8 million acres for mosquito control and public health.[1]

NAAA filed comments on the NPRM on October 3, 2025[2] and on the reopened Electronic Conspicuity (EC) and right-of-way questions on February 11, 2026.[3] This read-ahead raises no new issues and presents no new data. It re-emphasizes two points already in the record and supplies additional context, illustrating a well-documented limitation that was not presented in NAAA's prior submissions.

[1] National Agricultural Aviation Association. May 2019. *2019 NAAA Aerial Application Industry Survey: Operators.* https://www.agaviation.org/2019-naaa-operator-survey/
[2] NAAA. October 3, 2025. *Comments on FAA-2025-1908.* https://www.regulations.gov/comment/FAA-2025-1908-1842
[3] NAAA. February 11, 2026. *Comments on FAA-2025-1908, Reopening of Comment Period for Specific Electronic Conspicuity (EC) and Right-of-Way Topics.* https://www.regulations.gov/comment/FAA-2025-1908-3864

Extent of Low-Altitude Airspace Utilization by Aerial Application

Both of NAAA's asks rest on where aerial application aircraft physically operate. This section provides some context for those unfamiliar.

Altitude. For agricultural applications, aircraft maintain level flight as low as **10 feet above ground level** while dispensing product. Between each pass the aircraft must exit the field, turn, and re-enter at application height, which involves a rapid climb, up to 1,000 feet AGL for some aircraft and situations, followed by a rapid descent back in. The **average altitude across passes and turns is 38 feet AGL**, with an average of roughly 1,750 feet of horizontal distance covered in each turn outside the target area.[4]

Volume. Aerial application treats approximately 127 million acres of U.S. cropland annually at an average field size of 166 acres, equating to an estimated **763,000 fields per year**. Using a 70-foot effective swath width, that is roughly 14.8 million miles flown in application passes and a further 9.6 million miles flown in turns, for a combined **24.4 million miles per year at an average altitude of 38 feet AGL**. That total excludes ferrying, and excludes the forest, pasture, rangeland and public health acreage treated each year.

Obstacles. Because the goal is to treat the entire field, passes are made up to the field edges and around powerlines, structures and tree lines. A poll of NAAA member operators indicated roughly 1.7 sets of powerlines per field on average. Conservatively assuming only a single powerline must be cleared per field, NAAA estimates agricultural aircraft pass within 25 feet of a powerline **more than 29 million times per year**. FAA's own ASSURE A45 study measured those clearances at **3 to 6 feet** climbing out over a powerline and **10 to 15 feet** descending into a field.[5]

Public health work. Of the 4.8 million acres treated annually for mosquito control and other public health purposes, approximately 1.9 million acres are mosquito adulticide applications. These are conducted almost exclusively by manned aircraft, at a recommended application height of **150 to 400 feet AGL**.

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[4] Mississippi State University Raspet Flight Research Laboratory. 2020. *Characterization of Agricultural Aircraft Performance Using Flight Log Data.*

[5] ASSURE: University of North Dakota. September 2024. *A45 Shielded UAS Operations: Detect and Avoid (DAA), Final Report.* https://www.assureuas.org/wp-content/uploads/2021/06/A45_Task7_Final_Report_v5_FINAL.pdf

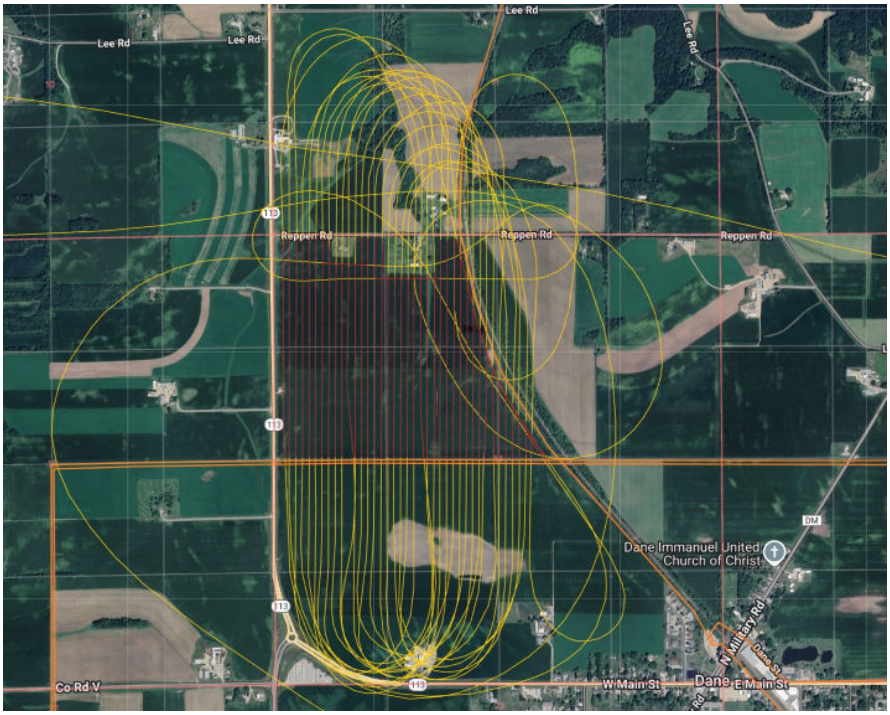


Figure 1. GPS map of a completed aerial application on a field in Wisconsin, reproduced from NAAA's October 2025 comments. The yellow line is the aircraft's flight path, turning red over the target field when the spray is on. Orange lines are powerlines, rose lines are sectional boundaries, and the gray line is a railroad track. This field required 39 passes plus 2 trim passes. All 39 passes required clearing the powerlines on the south edge of the field on either entry or exit, and 12 passes required clearing two powerlines. The three deviations from parallel on the south border were flown to avoid power poles. All powerline clearances were 25 feet or less.

Summary of NAAA's Two Asks

1. Remove the shielded-area right-of-way carve-out. Strike § 108.205 and the § 108.195(a) exception for shielded operations. Manned aerial application aircraft routinely operate within the proposed shielded envelope. FAA's own ASSURE-sponsored research documents agricultural aircraft flying within 25 feet of powerlines, and those pilots typically cannot see a UAS in time to avoid it.

2. If ADS-B or EC is to carry the detect-and-avoid burden, require that the UA receive the signal itself, in the air. Proposed Part 108 contains no explicit ADS-B In requirement and no specification of where reception occurs. Reception by ground-based infrastructure must not be accepted as compliance. NAAA's position remains that ADS-B and EC alone are insufficient as a sole detect-and-avoid method at aerial application altitudes, and that comprehensive detect and avoid, effective against both cooperative aircraft (those transmitting ADS-B Out or EC) and non-cooperative aircraft (those transmitting neither), should be required in all airspace.

Part 1. Shielded Areas

NAAA's October 2025 comments documented this at length. In brief:

- **Exposure is not remote; it is routine.** As set out above, agricultural aircraft pass within 25 feet of a powerline **more than 29 million times per year**. That is 29 million passes per year through areas proposed to be designated as "shielded areas where no manned aircraft are expected to operate."

- **The 50-foot standoff does not create separation.** FAA reasons in section VI.L that "manned operations should be operating far enough away from powerlines that a 50-foot limit should provide enough of a separation distance."[6] FAA's own ASSURE A45 study found the opposite, as noted above: **3 to 6 feet** climbing out over a powerline, and **10 to 15 feet** descending into a field.

- **The underlying data omitted our industry.** The BVLOS ARC's airspace occupancy work relied on ADS-B-derived data at a time when only about 10 percent of aerial application aircraft were ADS-B equipped. The shielded-area recommendation therefore rests on a dataset that structurally could not see us. The figures in Part 2 show that this blind spot has not been fully closed even today.

- **The rules contradict each other.** Section 108.195 would absolve a Part 108 UA of any duty to yield inside a shielded area, while proposed § 91.113(h) would preserve right-of-way for a manned aircraft broadcasting ADS-B Out or EC. In effect, neither aircraft is required to yield. Meanwhile proposed § 91.1(g) would exempt Part 108 operations from the § 91.113(b) bedrock duty that "vigilance shall be maintained by each person operating an aircraft so as to see and avoid other aircraft."

- **Even a pilot who sees the UAS may have no safe option.** An aircraft making a pass at 15 feet AGL, climbing out over a perpendicular powerline, that spots a UAS 30 feet above and along that line, faces a split-second choice among a midair collision, controlled flight into terrain, or a hard pull-up into an unrecoverable stall.

[6] FAA. August 7, 2025. *Notice of Proposed Rulemaking, Normalizing Unmanned Aircraft Systems (UAS) Beyond Visual Line of Sight (BVLOS) Operations.* Docket FAA-2025-1908, RIN 2120-AL82.

Part 2. ADS-B Is Not Sufficient, and Ground-Based ADS-B Is Not Air-to-Air

2.1 The rule requires the UA to yield, but never says where the signal must be received

Proposed § 108.195(a) requires a Part 108 UA to "yield the right-of-way" to aircraft broadcasting via ADS-B Out or EC. Proposed § 108.825 requires only that the UAS "be designed with the capability to avoid aircraft as required in accordance with § 108.195."

Neither provision:

- imposes an explicit **ADS-B In** equipage requirement on the unmanned aircraft; nor
- specifies **where** the manned aircraft's broadcast must be received, whether on the UA itself or by ground infrastructure and relayed to a flight coordinator or automated data service provider (ADSP).

This is not a hypothetical gap. The preamble's discussion of the proposed Part 146 ADSP framework expressly contemplates providers of "distributed services dependent on **ground-based sensors or equipment**," which it describes as Infrastructure-as-a-Service. Under the rule as written, a ground-based ADS-B receiver network operated by an ADSP appears to be an available means of compliance.

NAAA raised this in its February 2026 comments, in response to Question 7:

"[B]eing electronically detectable also requires UAS to be properly equipped to receive manned aircraft ADS-B Out or EC broadcasts. NAAA recommends that all Part 108 operations require ADS-B In, specifically by removing any relief from this requirement in § 108.195(a) for § 108.205 shielded operations. Further, this should be an on-aircraft requirement, meaning that the UAS receives the ADS-B/EC signal directly, independent of any ground controller or infrastructure."

The figures that follow are offered as additional context for that recommendation.

2.2 How to read these figures

All captures are from ADS-B Exchange and show received ADS-B position reports for Part 137 aircraft working in September 2026. Registration numbers, owner information and application interface elements have been removed. What remains is the map, its scale bar, and the signal panel described below.

The display convention is critical:

- A **solid line** means the ground network actually received position reports along that path.

- A **dashed line** means **no position data was received**. The line is an interpolated estimate drawn between two widely separated received points.

The operational reality these tracks attempt to depict is well established. Aerial applications are flown as a series of **parallel passes** across the field, with **perpendicular trim passes** along the field edges, and a climbing procedure turn outside the field between each pass. The field shown in Figure 1 required 39 passes plus 2 trim passes.

Wherever a track departs from that parallel-pass geometry, the ground network lost the aircraft.

Three notes on what these figures are and are not:

- **The inset panel on Figures 2, 3 and 4 is the unmodified signal section of the same capture.** The line that matters is Receivers, the number of ground stations receiving that aircraft at that moment. Figures 5 and 6 are historical replays, for which the application does not report reception data.

- **They are illustrative, not a systematic survey.** These are representative examples of a pattern familiar to anyone who has looked for agricultural aircraft on ADS-B. They are offered to make a known limitation concrete, not as a statistical sample.

- **ADS-B Exchange is a crowd-sourced receiver network, not FAA's certified ADS-B ground infrastructure.** Receiver siting differs. What does not differ is the physics that governs every ground-based receiving network, FAA's and any commercial ADSP's alike. Ground reception requires unobstructed radio line of sight between the antenna and the aircraft. At the 10 to 38 foot AGL altitudes documented above, that line of sight is routinely broken by terrain, crop canopy, tree lines, structures and earth curvature. These figures illustrate that constraint. They are not a measurement of FAA's network.

2.3 Where ground receivers are dense, the track is complete

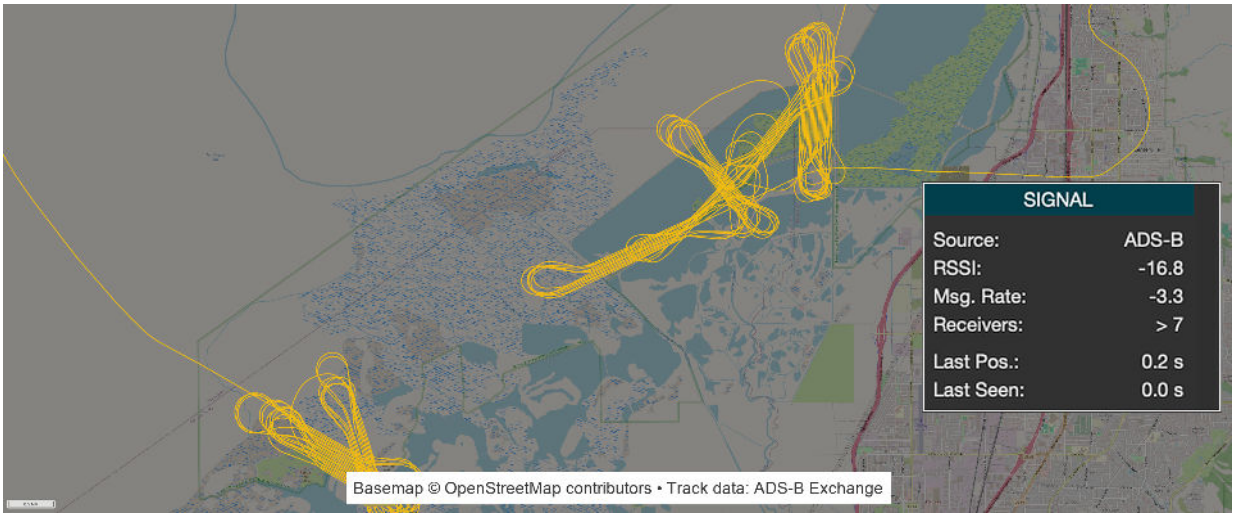


Figure 2. Air Tractor AT-504 working Farmington Bay, Utah, on the northern edge of the Salt Lake City metropolitan area. September 2026. Ground stations receiving the aircraft: **more than 7**. Every pass and every turn is drawn from received position reports. No segment is interpolated.

This is what the display looks like when the ground infrastructure can actually see the airplane. It is the baseline against which the remaining figures should be read.

2.4 Over rural cropland, the aircraft goes unreported for hundreds to thousands of feet at a time

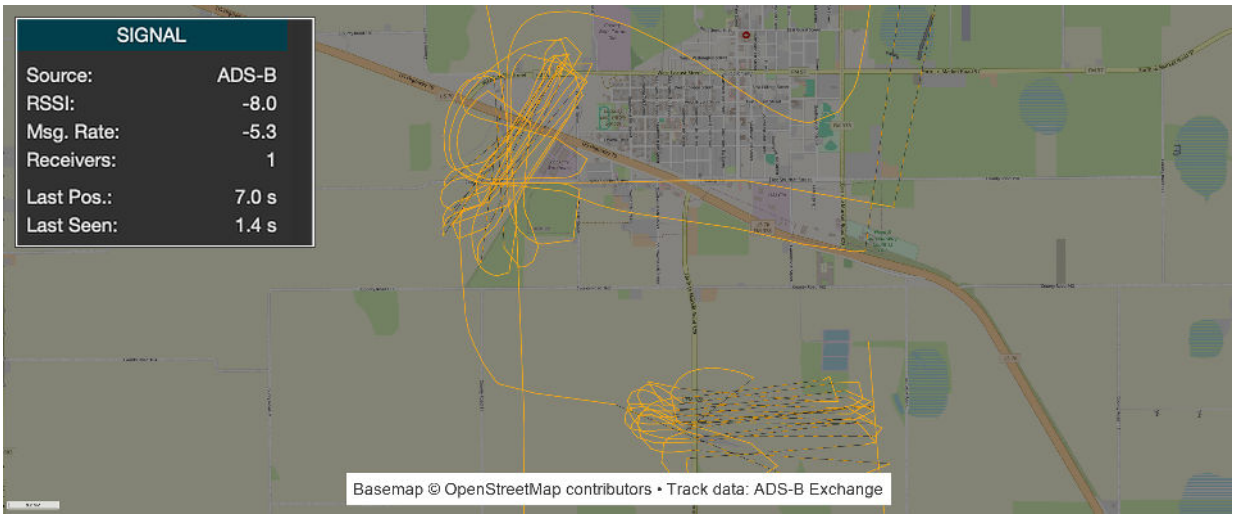


Figure 3. Air Tractor AT-802 working fields near Lockney, Texas. September 2026. Ground stations receiving the aircraft: **1**. Age of the last received position at the moment of capture: **7.0 seconds**. At the 84-knot groundspeed shown on the same capture, the aircraft had flown roughly **1,000 feet**

since the network last had a position for it. The southern field is drawn almost entirely from interpolation.

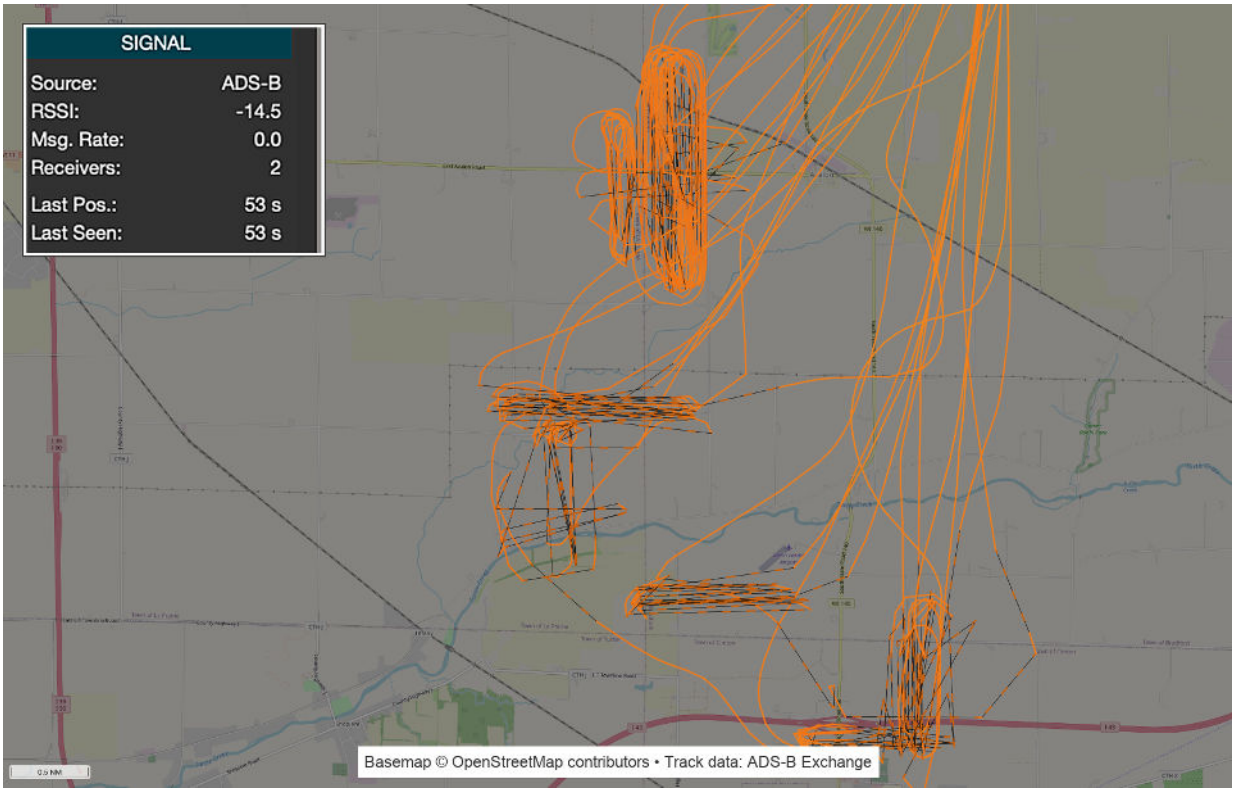


Figure 4. Air Tractor AT-802 working fields in Rock County, Wisconsin. September 2026. Ground stations receiving the aircraft: **2**. Age of the last received position at the moment of capture: **53 seconds**. At the 111-knot groundspeed shown on the same capture, the aircraft had flown approximately **9,900 feet, about 1.6 nautical miles**, since the network last had a position for it.

These are the same class of aircraft flying the same kind of pattern as Figure 2. The variable that changed is how many ground receivers happen to be nearby. **Coverage is a function of where the infrastructure is, not of whether an aircraft is present.**

2.5 The coverage gaps fall precisely where the work is done

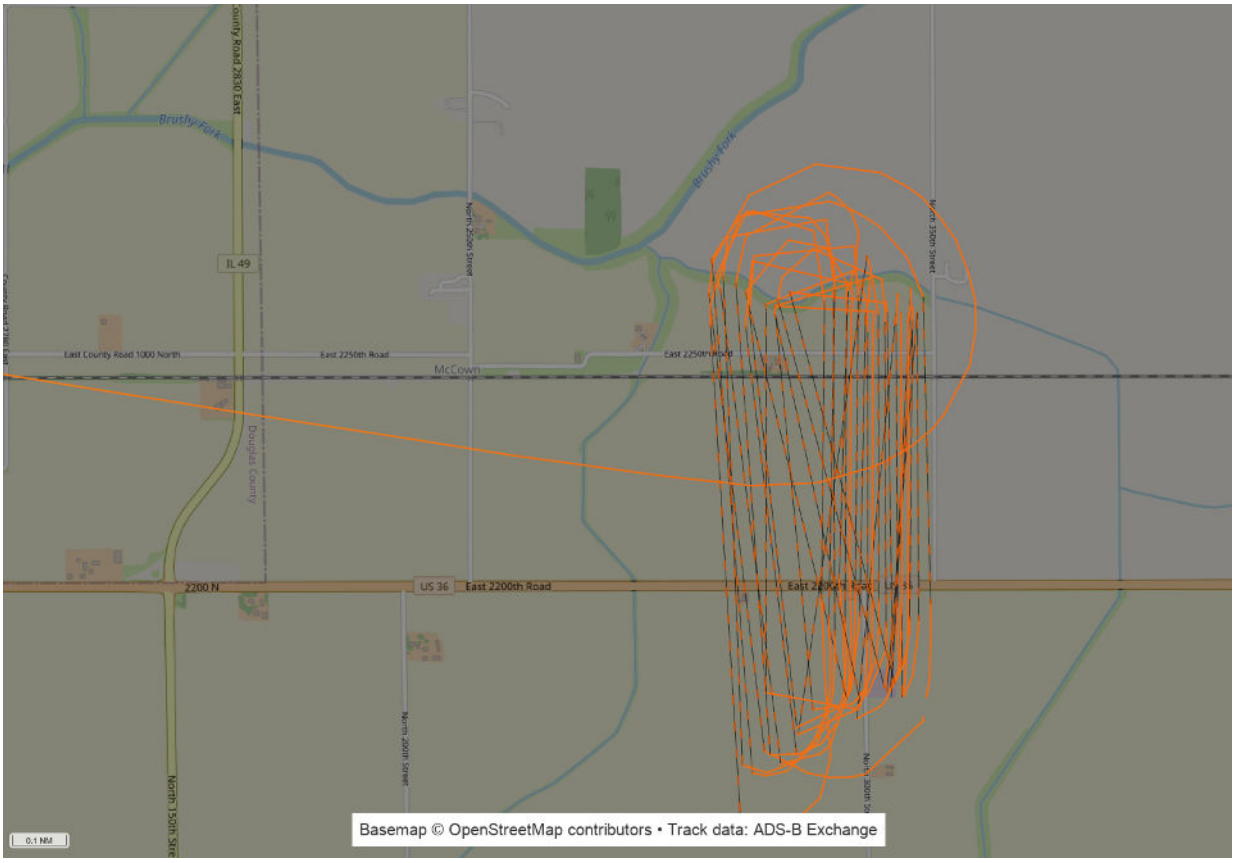


Figure 5. Air Tractor AT-802 working a field near McCown, Illinois. September 2026. The climbing procedure turns at the north and south ends of the field, flown highest, are drawn from received data. The parallel application passes through the field itself are missing and mostly misdrawn from interpolation.

The ground network tracked this aircraft when it climbed out of the field and lost it every time it descended to application altitude. The portion of the flight that was successfully surveilled is precisely the portion that was *not* over the field. The portion that went dark is precisely where a UAS operating in or adjacent to that field would need to know the aircraft was.

2.6 A long enough gap does not merely degrade the track; it fabricates one

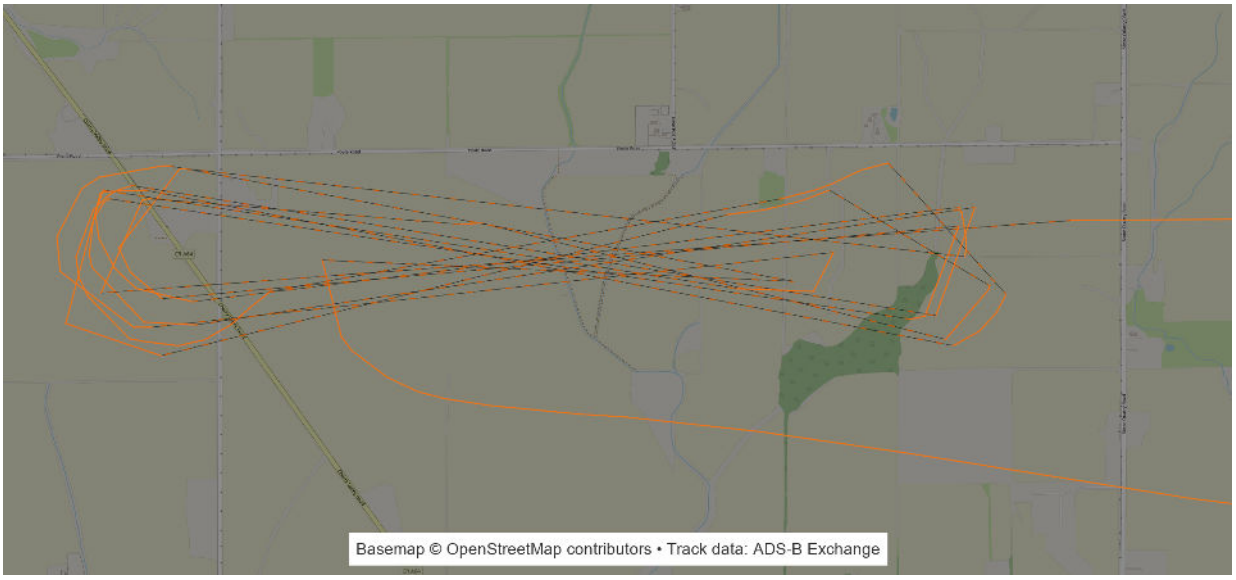


Figure 6. Thrush working a field in Boone County, Illinois. September 2026. The interpolated segments form an X across the field. The application was flown as parallel passes. No scale bar was present on this capture.

No aircraft flew that pattern. The X is an artifact of the ground network receiving a position at one end of the field and then not receiving another until the aircraft had already worked its way across to the other side, several passes later. The software connected those two points with a straight line, then did the same in the other direction.

This matters beyond the picture. A system reasoning from these reports would not merely hold a degraded track. It would hold an **affirmatively wrong** one, placing the aircraft diagonally across ground it never overflew while failing to place it on the passes it actually flew.

2.7 A stale target defeats the safe-distance requirement of § 108.195(b)

Proposed § 108.195(b) requires a UA yielding right-of-way to remain at a "safe distance," determined "in accordance with a method acceptable to the Administrator," and the preamble anticipates a standard that "statistically mitigates the risk of a collision to a remote event."

A safe-distance computation is only as good as the target state it is computed from. At a typical application airspeed of 130 knots, an aerial application aircraft covers roughly **220 feet every second**. A ten-second reception gap therefore places the aircraft about 2,200 feet from where it was last reported. A twenty-second gap places it about 4,400 feet away, which is roughly the length of an average single field pass.

The gaps in these figures are not hypothetical. Figure 3 shows a position report 7 seconds old and Figure 4 shows one 53 seconds old, corresponding on those captures to roughly **1,000 feet** and **9,900 feet** respectively. During intervals of that length, a UA relying on ground-received ADS-B has no target at all. It is not computing a degraded separation. It is computing separation against an aircraft it does not know exists.

Compounding this, the aerial application aircraft is maneuvering extensively throughout. As described above, it climbs rapidly out of the field, up to 1,000 feet AGL for some aircraft and situations, and descends rapidly back in, on every pass. Linear extrapolation from a stale position report is therefore least reliable in exactly the regime where it would be relied upon.

2.8 What NAAA asks

1. **Require ADS-B In for all Part 108 operations, received on the aircraft.** The UA must receive the manned aircraft's ADS-B Out or EC broadcast directly, air-to-air, independent of any ground controller, ground receiver network, or ADSP relay. Ground-based ADS-B surveillance should be expressly excluded as a sole means of compliance with § 108.195.

2. **Remove any relief from that requirement for shielded operations** in § 108.195(a).

3. **Do not treat ADS-B or EC as a sufficient standalone detect-and-avoid method.** NAAA is aware of no study demonstrating that ADS-B or EC alone can function as a robust detect-and-avoid technology against manned aerial application operations in the low-altitude environment. Until such evidence exists, comprehensive detect and avoid, effective against both cooperative and non-cooperative aircraft as already proposed for Class B and C airspace under § 108.180(b) and for Category 5 areas under § 108.185, should be required in all airspace. FAA has already acknowledged this risk and its mitigation. That acknowledgment should extend to the airspace where our members actually work.

4. **Publish the EC specification alongside any final rule.** Because the proposed right-of-way structure rests on manned aircraft carrying EC, the applicable Technical Standard Order or equivalent specification must be available when the rule issues. Otherwise the right-of-way protection will exist on paper before any operator can obtain the equipment to claim it.

Conclusion

NAAA supports the measured and safe integration of UAS into the national airspace system, and has participated in this docket and its predecessors continuously for more than a decade. Two provisions of this rule, as proposed, would compromise the safety of the pilots we represent.

The shielded-area carve-out would codify an unmitigated collision risk in airspace our members occupy tens of millions of times each year. And a detect-and-avoid framework that permits ground-

received ADS-B to stand in for air-to-air detection would rest the safety case on infrastructure that, as the imagery above demonstrates, routinely cannot see a manned agricultural aircraft doing its work.

We appreciate OIRA's and FAA's consideration.

Sincerely,



Matt Gill
Manager of Education, Safety and Policy
National Agricultural Aviation Association