



March 6, 2018

Ms. Christine Gervais
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Navigation and Airspace
Nav Canada
77 Metcalfe Street, 7th Floor
Ottawa, Ontario K1P 5L6
(by e-mail)

Re: Nav Canada's August 2017 Terms of Reference: Canadian Automatic Dependent Surveillance—Broadcast (ADS-B) Out Performance Requirement Mandate

Ms. Gervais,

The Canadian Owners and Pilots Association (COPA) welcomes Nav Canada's proposed Terms of Reference for a Canadian Automatic Dependent Surveillance—Broadcast (ADS-B Out) performance requirement mandate. Representing more than 16,000 pilots and aircraft owners, COPA is the second largest civil aviation organization in the world and we are pleased to have the opportunity to assess this proposed Nav Canada project relative to its impact on general aviation (GA).

COPA's Perspective

ADS-B Out is a satellite-based surveillance technology and will contribute to increasing air traffic efficiency and potentially enhancing safety around the world. The proposed mandate is for a one-way data-link from aircraft-to-satellite. In order for the Canadian mandate to be successful, it is important to be aware of the differences between the types of operations taking place in Canada. The ADS-B 1090ES technology in Canada is designed to improve the efficiency of the air transportation system for high altitude, high speed, long-range air traffic, particularly the heavy aircraft operators and major carriers. Some of the goals are to provide improved spacing and shorter routes, bringing about reduced operating costs. This is quite different from low altitude short-range operations characteristic of GA.

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As for GA, COPA's concern centers on the cost/benefit ratio for the GA community.

The proposed ADS-B Out 1090ES mandate: cost/benefit for GA in Canada.

With the growth of the ADS-B technology around the world but particularly because of the mandate in the US, the cost of the equipment is gradually becoming less expensive to the private owner. However, current costs for acquisition and installation of the equipment remain between US\$5,000.00 to US\$6,000.00 US per aircraft. The GA fleet in Canada is roughly 30,000 aircraft. Adding ADS-Out to all the fleet would mean a total of around US\$150M being spent by Canadian GA owners and operators. If the installation requires antenna diversity, a factor still being studied, costs will increase by some undetermined yet significant amount. Additionally, the aircraft owner will face regular maintenance and recertification costs.

Knowing that the vast majority of the GA fleet is not looking for the same ANS efficiencies and performance improvements as the CAR705 and other operations of similar nature, the only potential benefit to GA for now is air traffic awareness resulting from using ADS-B In when an aircraft is equipped accordingly. ADS-B In is much cheaper than Out and can be portable, but ADS-B In is only good if others have ADS-B Out. In other words, the situational awareness is increased by receiving the outbound signal of others in their proximity, but only from those that have the outbound equipage.

The early adopters, if not already on board because of international travel, would mainly be the operators wanting to exploit the obvious gain in efficiency of ANS. That is not the case for GA, for who this is not a significant factor, if at all, while there are still radars on the ground and transponders in aircraft.

In COPA's view, the following points should be addressed, mitigated or made part of the ADS-B Out Terms of Reference:

1. Nav Canada should equip the whole GA fleet with ADS-B Out equipment. ADS-B Out serves primarily Nav Canada's goal to eventually reduce separation, have routes that are more efficient and in the end save the bigger operators time, fuel and therefore money which will offset their ADS-B investment. These are not the reasons or the motivations for GA traffic and operators as mentioned above. If the mandate is looking to equip GA with ADS-B for safety reasons, everyone needs to have ADS-B out, not just a few. A substantial portion of the costs would be covered by the savings from removing radar installations and nav aids modernization.
2. ADS-B 1090ES does not contribute significantly to enhancing safety in GA due to its significant lack of relevant features. COPA recognizes that some GA operators have already equipped with ADS-B 1090ES, both Out and In, according to their personal means, primarily because they travel to the US sufficiently to justify the investment. These same operators have also readily identified the shortcomings of ADS-B 1090ES from a GA perspective and have also equipped with 978UAT because of the close proximity to the US border. Below are some examples of safety-enhancing features that could be a benefit to GA and contribute to its acceptance in the milieu:
 - a. Datalink weather should be provided to GA without charge. COPA believes it would increase the cost/benefits case for GA to equip with ADS-B if free

datalink weather were to be provided in Canada (e.g. XM weather). This could be accomplished by satellite-broadcast technology or by establishing broadcasts from cell towers. Inflight weather information, once unaffordable for many, has significantly increased safety for those operators who must fly at lower altitudes and routinely in and around adverse weather. Canadian GA operators would benefit from this enhanced safety initiative.

- b. Traffic Information Service – Broadcast (TIS-B) With the satellite broadcast or cell towers or some other technology is used for weather broadcast, providing TIS-B could be envisioned where transponder-only equipped aircraft could also be shown on the devices of those that have ADS-B In.
 - c. The ADS-B Out mandate should allow for the GA owners to benefit from improved Search and Rescue protocol. The ELT as we know it represents the best technology available at the time the ELT mandate came into effect. This technology did provide some improvement in Search and Rescue operations for many years. Technology has now evolved tremendously to the point where we notice the shortfalls of ELT, providing dubious value in facilitating the location of missing aircraft. Due to its twice-a-second update rate via satellite data-link, ADS-B would undoubtedly provide pinpoint accuracy of an accident site, far beyond anything that can ever be expected from the ELT. It would also eliminate the need for time consuming and very expensive airborne searches based on inaccurate DF Homing techniques, when the ELT does function properly. COPA understands that this particular aspect is outside of Nav Canada's authority and requires negotiation with the regulator to respond to ICAO requirements, but looking for technological solutions in that direction would have a positive impact towards generating acceptance of ADS-B by the community and eliminating redundancies in technology.
3. Aircraft without an installed electrical system (i.e. no transponder) should continue to have a process to operate in Canadian airspace. A large number of aircraft (older, amateur-built, or other) operate in Canadian airspace without an electrical system without any prejudice to safety or efficiency, relative to their area of operation. It is essential these aircraft be permitted to continue operating without the burden of ADS-B Out mandate. This also addresses the many types of American aircraft that fly across the border into Canada including those with no transponder.
 4. Aerobatic aircraft should be exempt from the ADS-B performance requirements while conducting aerobatic maneuvers. It has become apparent in the U.S. that ADS-B equipped aircraft engaged in aerobatic maneuvers fail to meet all the performance requirements. It appears this issue is related to the antenna position on the aircraft and the frequent changes in reception quality with the satellite that will occur during aggressive maneuvering. Many U.S. aerobatic performers participate in Canadian air shows and fly in Canadian airspace. The same applies to Canadian aerobatic performers. Nav Canada should ensure their TOR accounts for this varied user community and their unique flight characteristics.

5. Nav Canada should provide a path to recognizing or integrating foreign registered aircraft equipped as compliant with any ADS-B Out requirement. The TOR notes Nav Canada is only considering compliant systems to be those transmitting on 1090ES. GA pilots in the U.S. are being offered the option to equip with either UAT or the 1090ES datalink, but the 1090ES does not allow for some of the primary benefits of ADS-B to GA – graphical weather and airspace information in the cockpit, at a much lower cost. This has left many US GA operators with a choice between two unsatisfactory options: UAT, which may limit their ability to fly internationally; or the lower performance and more expensive 1090ES, which prevents them from receiving valuable inflight information. Canadian GA operators do not have the option of such a choice, they are presented with a single possibility: the much more expensive and lesser performing 1090ES without any of the safety enhancements other forms of ADS-B could provide..
6. Nav Canada should interface with the FAA to identify methods of ensuring seamless cross-border operations for those wishing to have real-time privacy while using ADS-B. ADS-B transmits the Flight ID (i.e., call sign) and ICAO code of the aircraft. Now, with the proliferation of cheap receivers, tracking an ADS-B equipped aircraft via the internet is easy and available to anyone properly equipped. Privacy and security are fundamental issues for many aircraft operators. UAT operators have the ability to use “anonymous mode,” but that is not an option for those using 1090ES. COPA encourages Nav Canada to collaborate with the FAA in exploring potential solutions to ensure the existence of an ADS-B privacy program compatible with either country’s airspace.

Conclusion

After analysis of the Nav Canada’s proposed ADS-B Out Performance Mandate, COPA does not support the proposed ADS-B Out 1090ES mandate below FL180 due to the disproportionate ratio of cost to benefits for GA. We do not see any use or need for ADS-B for the GA community in the near to medium term, because of high costs burdening the aircraft owner and the lack of features and/or benefits enhancing the overall GA experience, efficiency, and safety unless everyone in the country is equipped. For now, this renders this proposal entirely unacceptable to GA operators in Canadian Airspace.

We encourage Nav Canada to develop strategies that would address the issues COPA raised, and present a workable ADS-B solution for GA below FL180 in the long term, that mitigates the burden of acquisition and installation as well as provides technological breakthroughs such as being able to replace antiquated ELTs. These would address the GA requirements and allow prospective adoption by this sector as technology progresses and costs go down.

Best regards,



Bernard Gervais
President & CEO