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January 11, 2018

Ms. Christine Gervais
Manager, Level of Service and Aeronautical Studies
Navigation and Airspace
Nav Canada
77 Metcalfe Street, 7th Floor
Ottawa, Ontario K1P 5L6

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

Dear Ms. Gervais,

The Aircraft Owners and Pilots Association (AOPA) respectfully submit the following comments in response to Nav Canada's consultation of the August 2017 Terms of Reference (TOR) for a Canadian Automatic Dependent Surveillance—Broadcast (ADS-B) Out Performance Requirement Mandate. ADS-B is a satellite-based surveillance technology, and is an integral component to increasing air traffic efficiency and enhancing safety for all pilots. We appreciate this opportunity to provide feedback on the proposed mandate and to share our lessons learned from the buildup to the U.S. mandate.

Representing two-thirds of all U.S. pilots, AOPA is the largest civil aviation organization in the world. We support the position of the Canadian Owners and Pilots Association (COPA) and share the belief that modernizing the air traffic surveillance system in Canada will provide benefits; however, we contend modifications to the TOR are necessary to ensure U.S. General Aviation operators continue to have access to Canadian airspace. In order for the Canadian mandate to be successful, it is important that the rule harmonize with the requirement imposed on U.S. operators by the Federal Aviation Administration (FAA), and accommodations made for those international operators using equipment other than 1090 MHz Extended Squitter (ES). Please find our recommendations listed below.

U.S. General Aviation has significant economic impact in Canada

In Canada, commercial airlines serve only 20% of the country's 1,460 public-use airports while U.S. General Aviation operates to all Canadian airports. These operators provide critical services and have a significant economic impact. General Aviation aircraft, from single-engine piston to large turbojets, are used for a wide range of flight operations, including personal transportation, flight instruction, medical missions, transporting medical supplies, emergency services, rescue operations, wildlife surveys, aerial surveying, agricultural aviation, firefighting, and law enforcement. U.S. General Aviation contributes to the Canadian economy through the transportation of goods and people, and the buying and selling of products and services while these visitors are in Canada.

In 2017, AOPA conducted a survey of our membership regarding international travel. In the past three years, approximately 60% of the respondents flew cross-border 1 to 5 times while 20% traveled across a border as pilot in command more than 10 times. Among General Aviation destinations, Canada was the most visited country with 42% of pilots having flown there. Two-thirds of the respondents' trips were specifically for personal reasons, such as tourism. On a typical trip, General Aviation pilots and

passengers will contribute to the economy through the purchase of fuel, visiting stores and restaurants, and buying hotel rooms. These expenditures support local taxes, payroll, and business development.

Americans account by far for the largest number of visitors to Canada. According to the 2016 annual report on Canadian tourism by the Tourism Industry Association of Canada, American visitor's average stay is four days with daily spending around \$146 U.S. dollars. A General Aviation visitor likely contributes financially more than that because of fuel charges and other aeronautical expenses. Based on the FAA's latest cross-border data, AOPA conservatively estimates that there are approximately 25,000 U.S. General Aviation flights to Canada each year. This large number of flights indicates tens of millions of U.S. dollars are being spent annually just from General Aviation. Furthermore, it is notable that many of these dollars are being spent in small Canadian towns, with small airports, and not just large tourist cities.

U.S. General Aviation must continue to have access to Canadian airspace

AOPA is supportive of the transition to satellite-based surveillance as there are safety and efficiency benefits for air traffic and operators. It is important that the transition to this technology does not adversely affect U.S. operator's ability to access Canadian airspace and the underlying airports. U.S. General Aviation has a substantial positive economic impact on Canada so it is important the TOR acknowledge the importance of safeguarding these operators access. In order for that to occur, AOPA argues Nav Canada should amend the draft TOR in several ways.

1. Limit ADS-B Out mandated airspace to those classes of airspace where it is justified. AOPA agrees with the phased implementation approach as initially only the airspace above 12,500 feet MSL is affected. This is a stratum of airspace where ADS-B equipage should be high. Over time, the transponder and ADS-B mandates for Class C airspace, and those few Class D Control Zones which already require transponders, could also justifiably be harmonized. We do not see any convincing justification for proposing the ADS-B mandate include Class E Control Zones or "all other controlled airspace." We believe this is an overreach and would impede many U.S. aircraft operators from visiting Canada. The TOR should be amended to show the scope of the mandate is limited to Class A, B, C airspace, and those Class D Control Zones where a transponder is already required, as this is the only airspace where a mandate is justified.
2. Allow an adequate transition period for those U.S. operators who would need to equip. Many U.S. aircraft owners live along the Canadian border, many miles from any FAA mandated ADS-B airspace. These aircraft owners would otherwise have no requirement or incentive to equip with ADS-B, but if there is a Canadian ADS-B mandate that will affect low-altitude airspace, it is important these owners have adequate time to meet the mandate. For example, many pilots from Alaska and Minnesota fly regularly to Canada and have no intention of equipping with ADS-B. Should Nav Canada justify expanding the mandate to lower altitude airspace, the soonest it should be effective is three years after the final rule is published by Transport Canada. This transition time is important to allowing outreach with aircraft owners, manufactures and shops to prepare, and time for pilots to install the equipment.
3. Aircraft without an installed electrical system (i.e., no transponder) should continue to have a process to enter and operate in Canadian airspace. Many types of aircraft fly across the border including those with no transponder. For example, many operators that bring hunters or adventurers to and from Canada may be flying older aircraft that do not have an installed electrical system. There is a process in place for the U.S. and Canada to allow these legitimate and important operations to take place. It is

important any ADS-B mandate continue to accommodate a waiver process for these aircraft operators.

4. Nav Canada should recognize aircraft equipped with 978 MHz Universal Access Transceiver (UAT) as compliant with any ADS-B Out requirement. The TOR notes Nav Canada is only considering compliant systems to be those transmitting on 1090ES; however, there are a significant number of U.S. General Aviation aircraft equipped with UAT ADS-B Out, particularly in Alaska. General Aviation 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 one of the primary benefits of ADS-B to General Aviation – graphical weather and airspace information in the cockpit. This has left many General Aviation 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. Even flights originating and terminating within the U.S. may require brief overflight of Canada. For example, a flight between Juneau and Anchorage, Alaska, may require an overflight of Canada following the inland route – a necessity under some weather conditions. Also, pilots frequently fly through Canada, sometimes Canadian Class B airspace, from the New England region to the Great Lakes region. For safety and for harmonization, Canada’s mandate should state operators with UAT equipped aircraft will either be recognized or exempt from the ADS-B mandate (outside of Class A airspace).
5. Nav Canada should work with the FAA to ensure there is a seamless cross-border program for those operators who wish 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, and now, with the proliferation of cheap receivers, tracking an ADS-B equipped aircraft via the internet is easy. 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. The FAA is evaluating a program that would allow 1090ES equipped operators to be assigned alternate ICAO codes that would change or rotate over time. In combination with random call signs, this should allow real-time privacy. This solution is designed to have no impact on air traffic operations, but it is currently limited to U.S. domestic operations. Nav Canada should work with the FAA to ensure that there is an ADS-B privacy program that is compatible with either country’s airspace.
6. 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. Nav Canada should ensure their TOR accounts for this user community and their difference in flight characteristics.
7. ADS-B technology should be leveraged to make cross-border flying more efficient. AOPA supports the position of Nav Canada and the FAA to not require ADS-B Out to cross the border. Pilots flying across the Canadian border must have an operable transponder transmitting a discreet code; however, should a pilot choose to equip with ADS-B, it would be beneficial if the operator was no longer required to obtain a discreet code given the ADS-B transmits the Flight ID. We encourage Nav Canada to work with the U.S. Customs and Border Patrol and Canada Border Services Agency to leverage ADS-B technology and remove onerous requirements that are no longer justified.
8. Datalink weather should be provided to General Aviation for free. The FAA incorporated free datalink weather as part of increasing the benefits case of ADS-B equipage for General Aviation for

those willing to invest in the avionics that could receive it. 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. AOPA believes it would increase the benefits case for General Aviation to equip with ADS-B if free datalink weather was provided in Canada. This could be accomplished by satellite-broadcast technology or by establishing broadcasts from cell towers. It is important Nav Canada consider the importance of interoperability with existing avionics. Canadian and U.S. General Aviation operators would benefit from this safety improvement.

9. Mandated ADS-B performance specifications should be compatible with existing systems. The TOR states the ADS-B transmitter must meet current or later versions of DO-260. AOPA supports the recognition of this international standard as the basis for a mandate as it means existing 1090ES avionics will be compliant. We encourage Nav Canada to harmonize their ADS-B performance specifications and certification standards with the FAA's standards to ensure avionics solutions are affordable and available for aircraft owners. We believe any amendment in specification must be justified and validated with the larger standards community. A requirement for diversity antennas should be thoroughly scrutinized before a mandate is considered. Harmonizing to the extent practical will keep equipage costs low for U.S. and Canadian operators.

Conclusion

There are thousands of U.S. General Aviation aircraft visiting Canada each year and contributing to local economies. Nav Canada must carefully consider the impact the proposed ADS-B mandate would have on these operators and their ability to continue to fly in Canada. To continue to entice U.S. General Aviation tourists and business, it is important the ADS-B mandate TOR incorporate the recommendations we have laid out above. AOPA believes embracing these recommendations is critical to General Aviation realizing the full benefits of ADS-B technology and Nav Canada achieving efficient satellite-based operations. We are supportive of the transition to satellite-based surveillance as the increased surveillance coverage will facilitate improved flight following, particularly at lower altitudes, and it will improve the accuracy and response of search and rescue.

We appreciate this opportunity to provide our feedback during the TOR consultation process, and we hope our recommendations will assist Nav Canada in their drafting of the Aeronautical Study Report to be submitted to Transport Canada. Thank you for reviewing our comment on this important issue. Please feel free to contact me at 202-509-9515 if you have any questions.

Sincerely,



Rune Duke
Director, Airspace and Air Traffic

The Aircraft Owners and Pilots Association (AOPA) is a not-for-profit individual membership organization of General Aviation Pilots and Aircraft Owners. AOPA's mission is to effectively serve the interests of its members and establish, maintain and articulate positions of leadership to promote the economy, safety, utility, and popularity of flight in General Aviation aircraft. Representing two-thirds of all pilots in the United States, AOPA is the largest civil aviation organization in the world.