

May 4, 2016

To David Inch

RE: Toronto Area Airspace

I am writing to provide an update on NAV CANADA's efforts to identify measures to reduce community noise exposure in the Toronto area.

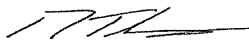
As part of your work with various community groups you have made a number of recommendations in this regard in recent years. The issues you have raised are being explored further as part of the current process, such as adjustments to speed restrictions. I have attached a document which provides further assessment and feedback regarding the issues you have identified.

At this time NAV CANADA will be contracting an outside party to undertake a review of Toronto Airspace with the aim of identifying additional opportunities to reduce community noise exposure. We expect to be in a position to identify the company that has been retained for this work in a matter of weeks. The reports and suggestions you have made over the years will be provided to them for assessment. It is our intention that, as part of their work, the company will also liaise with community stakeholder groups in Toronto. I expect that they will want to meet with you as part of this process.

The work to be undertaken will also include a study into operations at comparable global hub airports to see if there are practices that could be applied in Toronto that are within NAV CANADA's authority and compliant with Canadian regulations.

I want to acknowledge your continued engagement on this issue. While there are no easy solutions to these issues, by working together we will ensure a robust process that remains focussed on identifying practical measures that can be taken.

Sincerely,



Rob Thurgur
Vice President, Operations

Attach

Evaluation of CYYZ STARS
NAV CANADA Operational Response

A number of observations and recommendations for the management of airspace in the vicinity of Toronto Lester B. Pearson International Airport (LBPIA) have been provided over the past years. Exchanges and discussions on this issue have been progressing through organized face-to-face meetings, e-mails, conversations, and through correspondence provided by other parties concerned with the outcomes of air traffic management decisions.

The following is provided in response to the e-mail of January 19, 2016, from David Inch and to bring the various discussions up to date with regard to changes that are already in process or should be the topic of further examination.

Many of the items below deal with the underlying design and structure of the airspace and will be addressed first, specifically; Standard Instrument Departures (SIDs), Standard Terminal Arrival Routes (STARs), and instrument approaches.

LINNG is one of the waypoints that serve as an arrival gate to funnel traffic in from US airspace into the traffic management structure to support the required sequencing for arrivals and separation from departures. NAV CANADA has experimented with constructing a STAR routed directly from this arrival gate to the final approach area for westbound arrival and departure operations. The area in question combines two streams of arrivals crossing five streams of departures with all aircraft climbing, descending and changing speeds. The testing highlighted a number of challenging conflicts between arriving and departing flights and supports the continued need for a structured SID and STAR architecture to support the airspace capacity to safely meet the traffic complexity and density demands. Consideration must be given to the larger volume of airspace to effect air traffic arrival sequencing through the use of path extension as well as predictive arrival times and speed control on a defined lateral path. Also, use during higher traffic volumes increases the complexity of sequencing operations which can have a detrimental effect on safety.

The analysis did identify opportunities that are influenced by fluctuating traffic demand to take advantage of different flight management profiles during overnight and other periods of reduced traffic density. This will be part of upcoming review and consideration by a third party contractor and we look forward to further discussion on its merits.

With respect to the speed profile of aircraft that continue to fly the lateral path of the STAR for sequencing, we have identified an opportunity owing to changing design criteria that will enable us to permit a further increase to the existing downwind speed. This will respond to concerns raised over the use of flaps and associated increased aerodynamic noise generated by aircraft in the downwind leg. We are working through the associated system changes required and implementation timelines and will share the outcomes in the near future.

Regarding the vertical profile of the STARs, constant descent approaches (CDA) that avoid level segments are desired. We recognize the advantages in both reduced noise generation and Greenhouse Gas Emission (GHG) reduction that these profiles enable. We are interested in maximizing the opportunity for aircraft to conduct CDA approaches; however, this desire must be overlaid with the operating context and separation regulations associated with using parallel simultaneous arrival and departure runways. This operating mode is necessary during busy daytime operations to maintain the approach and departure capacity and avoid undesired flow management techniques such as airborne holds. Very specific globally applied regulations require the High/Low procedure which keeps aircraft vertically separated by not less than 1000 feet until both aircraft are established on the final approach vertical path.

There are three options being studied that will increase the extent to which CDAs can be used.

One option is for night-time operations when demand does not require the use of parallel runways. Specific flight profiles will be part of upcoming consultation and forms one aspect of ongoing discussions with the Greater Toronto Airport Authority (GTAA) and a wide range of stakeholder associations.

A second option is to remove or adjust the downwind ending anchor point to enable more dynamic descent profiles that are responsive to traffic demands. This option requires further investigation that will include traffic simulation and analysis of pilot behaviour to ensure that the intended vertical profiles will be achieved from placement of coded altitudes at appropriate points on the STAR. Consideration for the placement will include the need for the Flight Management System (FMS) to have a target point to align the vertical profile at the appropriate time in the descent management phase.

The third option, and the one that requires the longest lead time, is the implementation of Required Navigation Performance Authorization Required (RNP AR) approach procedures. RNP AR approaches can be designed with a constant descent curved approach. In addition, NAV CANADA is working concurrently with ICAO and Transport Canada to allow the use of RNP AR during parallel simultaneous arrival and departure runway operations. The critical desire is to conduct these operations without the requirement to adhere to the High/Low procedure. The long lead time for this option is owing to the required regulatory changes.

There were numerous other observations and recommendations put forward for consideration related to ATC practices when operating within the currently designed structure. Since these practices will necessarily need to fit within any change in the underlying design, it would be appropriate to keep them in mind and ensure that they are addressed as we proceed with the ongoing review of the options identified above.

It is important to note that as stated in the *Airspace Change Communications and Consultation Protocol* (ACCCP) signed by NAV CANADA and the Canadian Airports Council and endorsed by the Minister of Transport, we recognize that airspace and airport operations, and updates or changes to these operations, can impact communities in material ways. Our aim continues to be to minimize these impacts while ensuring we collectively provide the critical infrastructure required to support social and economic growth at a local, regional and national level. At the heart of the ACCCP is transparent engagement with our stakeholders and community because NAV CANADA has a genuine interest in ensuring open and collaborative communications.

The ACCCP establishes a framework to ensure residents have the opportunity to know that a change may be taking place, why the change is necessary, and to learn and understand how the change may affect them. It also enables residents to provide input that will be taken into consideration as part of the design process.

As an overarching objective, airspace change must not in any way reduce the level of safety in the system while balancing the environmental concerns to reduce greenhouse gas emissions and the impact of aviation noise on underlying communities. An acceptable level of safety is assured by customers' and service providers' adherence to detailed regulations and standards. These include, but are not limited to; Canadian Aviation Regulations (CARs) and Standards prescribing how aircraft shall be operated, CARs prescribing in what manner and where air traffic services may be provided, criteria governing the design and maintenance of specific flight paths and their supporting systems, and approval of how the exchange of information must be communicated via radiotelephony and other means between all parties in the system to ensure safety. Within this regulatory framework there are real opportunities to provide emissions and noise mitigation; however, the margins for variation are often limited, and aviation safety can never be traded-off to enhance emission or noise reductions. Therefore; operating within the confines of existing standards and regulations, NAV CANADA will continue to seek to balance the opportunity to reduce greenhouse gas emissions while respecting the need to mitigate noise exposure to residential communities. This is part of our mandate to maintain and improve on the critical aviation infrastructure required to support social and economic growth at a local, regional and national level.

Within this context NAV CANADA exercises a Change Management and Consultation Process (CMCP) that documents and encompasses checks and balances prior to moving to publish a new or materially modified flight path. The ACCCP is embedded in this process. Additionally, NAV CANADA conducts complimentary consultation with its customers through our Performance-based Navigation (PBN) Customer Working Group (CWG). The Terms of Reference of the PBN CWG explicitly state its purpose to provide a cooperative and collaborative venue for our customers and other external stakeholders to have input into NAV CANADA's PBN implementation process.

Although the participants in these processes understand the mandate to consider all environmental imperatives, additional detail is being added to the CMCP and PBN CWG terms of reference to specifically define requirements and document considerations. The following guiding principles are an

expansion on the foundations defined in the ACCCP and provide additional context and specificity as to how noise mitigation options are developed and implemented.

- Define where solutions may have conflicting benefits; environmental (i.e., GHG reduction versus noise distribution/reduction), social and economic public interest, safety, etc.
- Identify opportunities to reduce aircraft noise affecting residential areas through lateral or vertical adjustment of flight paths
- Identify high and low volume traffic considerations
- Identify opportunities for noise mitigating day/night operations
- Identify opportunities for varying week day / weekend operations
- Identify where community input is required as per the ACCCP and where it is desired outside of the requirements of the ACCCP, including scope and depth of involvement
- Identify the magnitude of impact of change in terms of affected population
- Identify and leverage existing airport and community venues for collaborative input
- Identify opportunities to promote an understanding of airport operations for affected neighbourhoods including common question and answers for proposed change initiatives
- Identify mitigation options considering both noise single event intensity and frequency
- Identify where subject matter expertise outside of the existing collaborative group is required
- Ensure that changes are considered in the broader system context and not a single airport centric
- Where critical change assumptions are made, establish pre and post implementation means to verify that the change objective was achieved

These items will be recorded in the PBN Requirements Document created as part of the Change Management and Consultation Process and are collaboratively developed by the participating parties.

Going forward, PBN airspace changes in a Terminal area will have a PBN Requirements Document available for reference that will serve to answer many of the questions regarding environmental concerns related to both noise and GHGs in the vicinity of airports. This document will be the basis for a shared understanding of airspace management and the motivation for proposed change.