Information on proposed changes to arrival routes for Halifax Stanfield International Airport

Public Consultation Period
July 29, 2016 to September 12, 2016
What is included in this information package:

- A bit about NAV CANADA
- An overview of the proposal (background, scope)
- An explanation of RNP
- Maps showing current traffic patterns and published routes
- Maps showing proposed routes and expected usage
- Noise modeling information
- Links to the public comment tool
Who We Are

- 2nd largest air navigation service provider in the world
- 12 million aircraft movements
- Over 18 million square km of airspace
- 4,600 employees across the country
- Safety is our 1st priority
Our Services

- Air Traffic Control
- Flight Information
- Weather Briefings
- Aeronautical Information
- Flight Inspection
- Airport Advisory Services
- Electronic Navigation Aids
Project Background

- Aviation is an key component of the region’s transportation network and essential to economic prosperity and the needs of modern society.
- The airspace structure surrounding Halifax Stanfield International Airport was implemented over 15 years ago.
- The busiest airspace in Atlantic Canada, the airspace structure is no longer optimal. New aircraft and navigation technologies provide the opportunity to meet the current and future demands of the aviation sector while reducing their environmental impact.
- Improvements to approach paths to Halifax Stanfield International Airport will reduce flying times and reduce GHG emissions as a result of reduced fuel consumption.
- The airspace study project is part of a national modernization program targeting the country’s busiest airports.
The objective is to improve the efficiency and reduce environmental impact of the system while maintaining safety standards.

The proposal would further leverage new satellite-driven navigation methods, known as Required Navigation Performance (RNP), while updating standard arrival routes.

RNP is in use at the airport today through company-specific approaches. This project would make RNP approaches available to all appropriately-equipped operators.

No changes are planned for departures. Only improvements to arrival routes are being proposed.
Scope of Proposal

- Efforts have been made to better avoid populated areas where possible.
- The project has no effect on municipal zoning as the changes occur outside the airport’s Noise Exposure Forecast (NEF) contours.
- The project has no direct impact on the quantity of aircraft that operate to and from Halifax International Airport.
- The consultation period runs until September 12, 2016.
Global/National Context for Airspace Modernization

- Required Navigation Performance is one of several new Performance Based Navigation (PBN) tools being implemented globally.
- The International Civil Aviation Organization (ICAO) has recommended that states develop a plan for the implementation of related technologies/procedures. Canada is supportive via Transport Canada.
- PBN is one of the tools being used to achieve targets outlined in Canada’s Action Plan to Reduce Greenhouse Gas Emissions from Aviation.
If implemented, the proposed improvements would result in reductions of

- 1,000 metric tonnes of GHG emissions/year
- 400,000 litres of fuel consumed/year
What is RNP?

Required Navigation Performance (RNP) is a navigation method that uses the aircraft’s flight management system and satellite positioning to fly a precise three-dimensional path in the sky.

RNP makes it easier to design safe efficient, predictable routes.

It is being used to update approach paths to airports for appropriately equipped aircraft.
Why implement RNP?

- Reduces track miles for arriving flights.
- Allows for a continuous descent (quietest type of approach).
- Reduces flight time, fuel burn and related greenhouse gas emissions.
- The predictable flight path and pre-programmed flight management system also reduces radio frequency congestion, requiring less interactions between the pilot and controller while maintaining safety.

Teal: Standard flight path
Green: Shorter RNP approach path
Video Overview of RNP

Improved Aircraft Operations Using RNP
What can it mean for communities?

Outcomes can include:

- Better avoidance of populated areas in some instances (though it is often not possible to entirely avoid populated areas).
- A “cleaner” aircraft profile (less increases or decreases in throttle, reduced flap use) compared to other approaches.
- Less variability of flight path location for those aircraft that are equipped to use RNP. Roughly 22 per cent of aircraft to YHZ are equipped today.
Types of approaches

Visual approach:
- increased pilot and ATC workload
- large degree of flight path variance
- less distance flown sometimes

Standard approach:
- predictable, essential at busy airports
- however flight path longer
- flight path longer

RNP approaches:
- highly predictable/repeatable
- reduced pilot and ATC workload
- quietest and most efficient

Visual approach:
- increased pilot and ATC workload
- large degree of flight path variance
- less distance flown sometimes
Types of approaches

Continuous descent: idle
Throttle and reduced flap usage
= less pollution and noise

Level flight segments require throttle increases = more pollution and noise
Flight Paths
Current and Proposed
Atlantic Canada’s busiest airport and a hub for the region.

More than 3.7 million passengers in 2015.

8th busiest by passenger numbers Canada’s / 22nd busiest by the number of annual aircraft movements (2014).

Economic impact of more than $1.3 billion for Nova Scotia.
The airport has four runways (each runway end is considered a separate runway for navigation purposes).
- Each runway end has a different number.
- Runways usage is primarily determined by wind direction, as aircraft land against the wind.
- Frequent runway alternation is normal, as is the use of two intersecting runways at any given time.
- Traffic is light during overnight periods.
About arrival operations to Halifax Stanfield International Airport

- Each year, the airport receives approximately 40,000 commercial arrivals.
- The airspace around CYHZ is busy and complex, with a mix of commercial, general aviation (smaller aircraft such as Cessnas), floatplane, helicopter and military operations across the region.
- There is a lot of variability in how arrival procedures are flown today. Vectored or visual approaches are common (these aircraft may not be on depicted routes).
- New approaches are a better reflection of how traffic is organized and are more efficient and environmentally-friendly.
- Many will continue using direct or visual approaches (at pilot’s request).
- Most communities in the HRM experience overflight today. Flight paths are over areas that experience overflight today.
- Loudest events in the region remain takeoffs. These will not change.
- 22 per cent of aircraft are equipped or will soon be equipped to perform RNP approaches at Halifax. Growth will primarily occur through fleet renewal, reaching ~30 per cent by 2020.
Notes about maps

- You can use “CTRL + left click” to open a higher res version of images in a web browser (note, these do not contain legends or other markups).
- Some maps have aircraft icons with an associated altitudes.
- Some maps have light green shaded areas to show airspace usage. This shaded area represents the areas that experience overflight today when a particular runway is in use. STARs provide guidance to the end of the downwind leg, at which point pilots wait for the controller’s instructions to turn on to the base leg. Aircraft will turn on to the base leg at various points depending on sequencing needs, pilot operation and aircraft performance. Despite the existence of RNAV and RNP routes, pilots can still operate in other places through the use of direct or visual approaches. In these instances, the pilot flies a more direct route to the final approach. Altogether, this means that approaches can be distributed over a wide region; the shaded areas on the maps below shows typical traffic distribution taking in to account all types of approaches.
- Only 22 per cent of aircraft are equipped to use RNP. The rest will be using a combination of standard arrival routes, direct or visual approaches. The result is that aircraft will continue to operate over a wide region.
- Single event noise contours provide example noise footprints of a single flight using the maximum noise level reached at a given location. While the contour is static, it is important to note that noise events are temporary. The aircraft modeled is the 737-800 for which the noise footprint is above average amongst the aircraft fleet that arrive at Halifax International Airport.
Design considerations

Procedures were designed taking into account the following considerations:

- Safety
- Community noise impacts
- Flight efficiency - track miles, capacity
- Geography – including location of industrial areas and non residential areas vs residential areas
- Legislative and regulatory framework - including airport noise abatement procedures
- Procedure design criteria and standards
- Traffic volumes and mix of aircraft fleet types
- Technology
- Operating costs
- Air traffic control rules and standards
RUNWAY 05
Runway 05 – 24 hours of traffic
21% arrivals land on 05
Departures
Arrivals
Runway 05 – RNP Altitudes

Proposed RNP route

Aircraft altitude (feet)

- 1,800'
- 3,700'
- 4,300'
Runway 05 – Annual Equipped Traffic Volume Estimate (based on 2015 data)

Proposed RNP route

Light usage of RNP from this direction

215 flights/year
Runway 05 – RNP (closer look)

Proposed RNP route
Runway 05 – Standard Arrival Routes

Airspace usage
Current STAR (altitude: 3,000')
Proposed STAR (altitude: 4,000')
Single event noise contour
Example of current standard arrival from the west to runway 05

- 55 dBA
- 60 dBA
- 65 dBA
- 70 dBA
- 75 dBA
Single event noise contour
Example of future standard arrival from the west to runway 05

- 55 dBA
- 60 dBA
- 65 dBA
- 70 dBA
- 75 dBA
RUNWAY 23
Runway 23 – 24 hours of traffic
44% arrivals land on 23
Departures
Arrivals
Runway 23 – RNP Altitudes

Proposed RNP route
Aircraft altitude (feet)
Runway 23 – Annual Equipped Traffic Volume Estimate (based on 2015)

2,100 flights/year

250 flights/year

Proposed RNP route
Runway 23 – RNP (closer look)

Proposed RNP route
Runway 23 – Standard Arrival Routes

Airspace usage

Current STAR (altitude: 3,000’)

Proposed STAR (altitude: 3,000’)

4,000’

5,000’

3,000’
Single event noise contour – future RNP arrival from the west to runway 23

- 55 dBA
- 60 dBA
- 65 dBA
- 70 dBA
- 75 dBA
Single event noise contour –
Example future standard arrival from the west to runway 23
RUNWAY 32
Runway 32 – 24 hours of traffic
22% arrivals land on 32
Departures
Arrivals
Runway 32 – Arrivals and RNP

Proposed RNP route
Current arrivals
Runway 32 – RNP Altitudes

Proposed RNP route

Aircraft altitude (feet)

3,700’

4,300’

1,800’

5,000’
Runway 32 – Annual Equipped Traffic Volume Estimate (based on 2015)

Proposed RNP route

Light usage of RNP from this direction

2,100 flights/year

Light usage of RNP from this direction
Runway 23 – Standard Arrival Routes

Airspace usage

Current STAR (altitude: 5,000')

Proposed STAR (altitude: 3,000')
RUNWAY 14
Runway 14 – 24 hours of traffic
13% arrivals land on 14
Departures
Arrivals
Runway 14 – Arrivals and RNP

Proposed RNP route
Current arrivals
Runway 14 – RNP Altitudes

Proposed RNP route

Aircraft altitude (feet)

- 5,000’
- 1,800’
- 5,000’
Runway 14 – Annual Equipped Traffic Volume Estimate (based on 2015)
Proposed RNP route

- 150 flights/year
- 80 flights/year
Runway 14 – Standard Arrival Routes

Airspace usage

Current STAR (altitude: 3,000’)

Proposed STAR (altitude: 5,000’)

3,000’ 4,000’ 5,000’
How to provide your feedback:

- Complete our [online feedback form here](#). The consultation period runs until September 12, 2016.

- Attend the drop-in consultation event on August 24, 2016 anytime between 6:30 to 8:30 at:
  
  **Sackville Heights Community Centre**  
  45 Connolly Rd, Middle Sackville, NS  
  B4E 1S6

*Please contact service@navcanada.ca if you have any questions about proposed changes. We’ll do our best to respond within two business days.*