

# Updates to Procedures at St. John's International Airport

This document provides notice of upcoming changes to instrument procedures being implemented by NAV CANADA at the St. John's International Airport (CYYT) on December 7, 2017.

NAV CANADA will implement new arrivals procedures for aircraft utilizing runways 11/29 and 16/34. These updates will help ensure the airspace structure best meets operational safety and efficiency requirements while improving how the traffic mix is integrated and providing additional precision approach options in low visibility conditions.

Existing arrival procedures are being updated while new satellite based procedures are being added. Required Navigation Performance (RNP) is a new navigation technology that combines satellite-based positioning with modern flight management systems, allowing an aircraft to fly a precise route. This allows for the design of flight paths that are shorter and that provide for a continuous descent. Initially, only a small portion of aircraft – approximately 20 per cent – will be equipped to fly the new procedure.

The proposed flight paths are estimated to save up to three minutes flying time for some arrivals, with greenhouse gas emissions reductions estimated at 350 metric tonnes each year.

In addition, satellite navigation options are being added for helicopters which will improve integration of the traffic mix.

Please note that changes will have no impact on:

- Noise Exposure Forecasts (NEF)
- The amount or type of aircraft operating to and from CYYT
- VFR procedures or local traffic patterns (e.g. flight training operations, general aviation)

## 1.1 Runway 11 Instrument Approach Procedure Updates

Runway 11 received approximately 18% of arrival traffic at the airport in 2016.

The map below shows 24 hours of traffic (light blue tracks) as flown on a sample day as well as a composite of the new flight paths in dark blue. With very little traffic from the east, the <u>downwind</u> legs will be used scarcely.



 The map below shows the same 24 hours of traffic (light blue tracks) as flown on a sample day as well as a composite of the new RNP flight paths in dark blue. With very little traffic from the east, the downwind legs will be used scarcely.



## 1.2 Runway 16 Instrument Approach Procedure Updates

Runway 16 received approximately 18% of arrival traffic at the airport in 2016.

The map below shows 24 hours of traffic (light blue tracks) as flown on a sample day as well as a composite
of the new flight paths in dark blue. With most traffic coming from the west, the flight paths from the west
will see more use.



The map below shows 24 hours of traffic (light blue tracks) as flown on a sample day as well as a composite of the new flight paths in dark blue. With most traffic coming from the west, the flight path from the west will see more use while those from the east will see very little usage.



## 1.3 Runway 29 Instrument Approach Procedure Updates

Runway 29 received approximately 46% of arrival traffic at the airport in 2016. It is the most used runway at St John's International Airport.

The map below shows 24 hours of traffic (light blue tracks) as flown on a sample day as well as a composite
of the new flight paths in dark blue. A significant portion of the traffic from the west will use new approach
paths both to the north and south of the airport. Aircraft will typically be upwards of 5,000' as they cross
over the peninsula towards the east.



The map below shows 24 hours of traffic (light blue tracks) as flown on a sample day as well as a composite
of the new flight paths in dark blue. Many RNP equipped aircraft from the west will use new approach paths
both to the north and south of the airport.



## 1.4 Runway 34 Instrument Approach Procedure Updates

Runway 34 received approximately 15% of arrival traffic at the airport in 2016.

The map below shows 24 hours of traffic (light blue tracks) as flown on a sample day as well as a composite
of the new flight paths in blue. Most of the traffic from the west will use new approach paths to the south of
the airport. Traffic overflying St. John's, abreast the airport on the downwind leg, and using the new
structure will typically be at altitudes of ~4,000 to 6,000 ft Above Sea Level (ASL).



The map below shows 24 hours of traffic (light blue tracks) as flown on a sample day as well as a composite of the new flight paths in blue. Most of the traffic from the west will use new approach paths both to the south of the airport. At the point where aircraft start the arc, aircraft will at 3,500 ft.



#### **1.5 Helicopter Arrivals**

RNAV approaches are being added for two runways: 11 and 16. These will ensure efficient integration of helicopter with other aircraft by shortening the final approach. Since helicopters are slower than most commercial aircraft, a shortened final approach will reduce arrival and departure delays. The composite approaches can be seen below. Most helicopter traffic arrives from the east, from platform projects in the Atlantic Ocean.

## Runway 11



Runway 16



#### **Summary of Expected Outcomes**

Flight path changes will result in reductions in flying time, fuel burn and associated greenhouse gas emissions while ensuring that the airspace structure is prepared for future growth in accordance with navigation standards and technologies being adopted globally. Performance-based navigation also helps ensure airport access in poor weather conditions while reducing the need for holding patterns, diversions and delays. The proposed changes better integrate aircraft types, including airplanes and helicopters. While there are some changes to the lateral location of flight paths; these changes occur over water or, in some cases, at high altitudes over land (at comparable altitudes to today). These changes will ensure the St. John's International Airport benefits today from the use of new navigation methods while ensuring the airspace structure is prepared for future growth in demand by airlines and the passengers they serve.

Any questions or comments regarding improvements to the airspace structure surrounding St. John's International Airport can be sent to <u>service@navcanada.ca</u>.

For more information on NAV CANADA, the country's air navigation services provider, please visit <u>www.navcanada.ca</u>.

For more information on St. John's International Airport, Newfoundland's busiest airport, visit <a href="http://stjohnsairport.com/">http://stjohnsairport.com/</a>

### **APPENDIX 1- About Arrival Flight Paths**

Aircraft can approach an airport using a number of navigation methods. On days where visibility is good, aircraft will often conduct "visual" approaches. Pilots will navigate visually towards the runway according to Canadian Aviation Rules (CARs). Aircraft can also be directed by an air traffic controller, using "vectors". In both of these cases, the aircraft will not be flying on a specific, established route. While entirely safe, there can be a significant variation in flight track from flight to flight.

In addition to these options, most airports have published arrival procedures. These are made available in aeronautical publications used by pilots and usually programmed in to aircraft flight management systems. Some use Area Navigation (RNAV) while others use Required Navigation Performance (RNP), which both lever satellite based positioning. RNP allows for aircraft to follow a very precise route using continuous descent. It allows for the design of shorter routes that reduce flying distance and time with associated reductions in greenhouse gas emissions. Since RNP approaches allow for continuous descent and reduced power settings, they are also the quietest type of approach. RNAV does allow for aircraft to fly a predictable route, but may have some variation depending of the flight segment; design criteria is somewhat more restrictive.

Figures 1 and 2 below show lateral and vertical profiles of various approaches. The yellow flight track shows a visual approach, the green flight track an RNP approach and the blue an RNAV approach. The yellow track can be shorter as the pilot takes a direct route to the runway. However, the vertical profile of this example shows the aircraft flying long level segments at a low altitude. The blue flight track shows a typical RNAV approach. While absolutely essential for managing and sequencing traffic at a busy airport such as St. John's, the flight path can require that an aircraft fly longer distances to reach a runway. Finally, the green track shows an RNP approach. The flight path is both short and supports continuous descent and is optimal in terms of flying times for the public, emissions and noise as well as predictability for pilots and controllers.

For more information on RNP, watch the information video.



Figure 1 – Approach Types: Lateral Profile



Figure 2 - Approach Types: Vertical Profile

#### **APPENDIX 2 - Notes About Maps**

- Most of the maps show composites of all the approaches to a runway.
- Traffic samples show days where each respective runway received the bulk of the day's commercial traffic. Samples are for illustrative purposes and patterns will vary to some extent day-to-day.
- Aircraft often fly a downwind leg, whereby the aircraft flies parallel to the airport before turning towards the final approach. Use of this procedure will depend on the direction the plane is coming from and the runway in use as well as weather and sequencing requirements. The following image illustrates the general procedure:



An arriving aircraft will only employ one of the approaches depicted in the composite. For instance, each
image below highlights a complete and different approach in yellow to the same runway.

