AIRSPACE CHANGE
COMMUNITY ENGAGEMENT REPORT

Proposed Updates to STARs and the implementation of RNP AR approaches at Winnipeg Richardson International Airport

NAV CANADA
77 Metcalfe Street
Ottawa, Ontario K1P 5L6

August 2017

The information and diagrams contained in this report are for illustrative purposes only and are not to be used for navigation.
Table of Contents

Executive Summary ........................................................................................................................................... 3
1.0 Purpose .......................................................................................................................................................... 4
2.0 Background ................................................................................................................................................... 4
3.0 Overview of Proposed Changes to Routes ............................................................................................... 6
  3.1 Runway 13 Arrivals & Proposed Flight Paths .......................................................................................... 6
  3.2 Runway 18 Arrivals & Proposed Flight Paths .......................................................................................... 9
  3.3 Runway 31 Arrivals & Proposed Paths .................................................................................................... 12
  3.4 Runway 36 Arrivals & Proposed Paths .................................................................................................... 15
4.0 Environmental Assessment .......................................................................................................................... 18
  4.1 Overall Impact on Community Noise ...................................................................................................... 18
  4.2 Reduced Emissions ................................................................................................................................... 18
5.0 Community Outreach and Engagement ...................................................................................................... 19
  5.1 Engagement with Airport ........................................................................................................................ 19
  5.2 Website .................................................................................................................................................... 19
  5.3 Open House Events ................................................................................................................................. 19
6.0 Survey Results and Other Feedback .......................................................................................................... 20
  6.1 Methodology ............................................................................................................................................ 20
  6.2 Survey Respondents ............................................................................................................................... 20
  6.3 Summary of Input Received .................................................................................................................... 21
  6.4 Consideration of Main Mitigations Proposed by Residents ..................................................................... 23
7.0 Recommendation ......................................................................................................................................... 23
8.0 Communication .......................................................................................................................................... 23
9.0 Post Implementation Review .................................................................................................................... 23
Executive Summary

Area Navigation (RNAV) and Required Navigation Performance (RNP) are part of a family of technologies that lever the capabilities of modern flight management systems and the global navigation satellite system (GNSS) for safer and more efficient navigation. RNP is increasingly being used to provide safe and accurate arrival routes to busy airports; it is also a significant piece of the technology tool kit being utilized to meet commitments made by the global aviation industry to reduce greenhouse gas emissions.

This study examines the proposal to implement new RNP Authorization Required (AR) arrival procedures, update existing RNAV Standard Terminal Arrival Routes (STARs) while implementing a new STAR from the north and allowing for the use of RNAV technology on departure at Winnipeg Richardson International Airport (CYWG). The proposal includes adjustments to runways 13/31 and 18/36 and reports on noise modelling and the community consultation undertaken as per the Airspace Change Communications and Consultation Protocol.

The consultation process, which ran from February 15, 2017 to April 10, 2017, included the provision of detailed information materials online, briefings to elected officials, hosting of three community open house events and use of a survey mechanism to enable the public to provide direct comment. In addition, some noise modelling was conducted to illustrate the potential noise impacts of changes.

Feedback from more than 200 residents was received. Views were balanced and diverse, from many areas across the city and showing both some support and opposition for the project. Many clusters of respondents tended to be either located in areas affected by existing noise or located away from material community noise impacts. Where feedback aligned with potential future impact, mitigating factors such as high altitudes, low volume, or the potential for greater negative impacts from not implementing were apparent. Many in the consulted communities also viewed environmental benefits positively.

The consultation team's recommendation is to proceed with implementation of the updated RNAV STARs and proposed RNP AR procedures with a target implementation date in October 2017 while monitoring community response and following up with appropriate sound measurement activities to validate projected impacts.
1.0 Purpose

This study examines the proposal to update RNAV STAR procedures and implement new RNP AR procedures at Winnipeg Richardson International Airport. It reports on the community consultation undertaken as per the Airspace Change Communications and Consultation Protocol (2015). The report includes an overview of the proposed changes, expected environmental impacts (including emissions reductions), details public engagement activities and their results, and provides recommendations.

2.0 Background

Today, modern avionics are providing new opportunities to design routes that are no longer bound by ground-based navigational aids. These opportunities, enabled by Global Navigation Satellite System (GNSS), allow for the design of routes that are more precise, predictable, fuel efficient and environmentally friendly. RNAV and RNP are part of a family of technologies that lever the capabilities of modern flight management systems and GNSS for safer and more efficient navigation. RNAV provides an efficient navigation tool that is used by many aircraft as they approach Winnipeg Richardson International Airport today. RNP, which brings a new level of precision and design flexibility, is increasingly being used to provide safe and accurate precision approaches to busy airports; they are, together, a significant piece of the technology tool kit being utilized to meet commitments made by the global aviation industry to reduce greenhouse gas emissions.

The deployment of Performance Based Navigation (PBN) technologies, of which RNP and RNAV are a part, has been encouraged by the International Civil Aviation Organization (ICAO). ICAO took steps in 2007 to require its member countries to develop formal plans for the deployment of PBN in their respective jurisdictions. NAV CANADA’s Performance-Based Navigation Operations Plan (Edition 2, 2017) and the Transport Canada PBN State Plan identify the goal of achieving a total PBN environment in Canada with RNAV and/or RNP for all operations.

RNP achieves benefits in part by allowing for flight path designs that reduce the track miles that an aircraft must fly to its destination while providing for a constant descent compared to an approach that requires level segments (which in turn require more thrust and burn more fuel).

RNP AR has been used in Canada since 2004, primarily by WestJet using specific “company approaches.”

New criteria recently published by Transport Canada as part of TP308 Criteria for the Design of Instrument Procedures enable RNP AR approach procedures to be designed for use by more airlines and by more types of aircraft.

Winnipeg Richardson International Airport is Manitoba’s busiest airport and the country’s 7th busiest airport by the number of annual passengers, which surpassed the 4 million mark in 2016. Each year, the airport receives approximately 58,000 commercial arrivals. The airspace around CYWG is busy and complex, with a mix of commercial, general aviation (smaller aircraft such as Cessnas), helicopter and military operations across the region.
The airport has a variety of approach procedures, including RNAV STAR procedures that provide a combination of GNSS-based guidance and air traffic control instructions to a point where the pilot can intercept the glide path emanating from the ground-based Instrument Landing System (ILS). The airport has also been serviced by WestJet RNP AR approach procedures to each runway since 2007.

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). RNP AR approaches are being added for runways 13/31 and 18/36. Minor updates to RNAV STARs will see many aircraft operating in a fashion similar to the way they do today while the addition of a STAR for aircraft arriving from the north will assist with streamlining traffic while increasing efficiency. The use of RNAV for departures will allow for aircraft to employ the same track at lower altitudes as they do today while structuralizing aircraft separation in to departure routes.
3.0 Overview of Proposed Changes to Routes

The proposed RNAV STAR structure provides some improvements over the current STARs, primarily through the addition of arrival routes from the North to runways 31 and 36. Most of the proposed RNP AR approaches have been designed to mirror the downwind and final approach of existing flight paths with the base leg arc typically located within the existing distribution of traffic on the base leg.

The new RNP AR segments will result in a reduction of track miles flown for many aircraft and will enable a reduced power constant descent arrival at a three degree descent angle.

It is important to note that approximately 20 per cent of aircraft operating to Winnipeg Richardson International Airport today are equipped to fly RNP AR route. Equipage rates are expected to grow slowly but steadily over time through fleet renewal, reaching approximately 30 per cent by 2020. In some instances, aircraft may not always be granted an RNP approach for a variety of operational reasons, including sequencing requirements.

The following section provides maps showing the location of proposed routes, samples of existing traffic as well as volume estimates based on data from 2016.

3.1 Runway 13 Arrivals & Proposed Flight Paths

Runway 13 receives approximately 15 per cent of arrivals on an annual basis. It is frequently used in conjunction with runways 18 and 36.

Figure 1 shows a composite of the proposed STAR structure as it would be used for runway 13 (in blue) to the Winnipeg International Airport with a 24-hour sample of arrival traffic as flown by aircraft on October 16, 2016 (in turquoise). The new standard arrival routes will continue to have aircraft intercept the final approach – the point where the aircraft must line up with the runway – at around 10 nautical miles. The addition of a route from the south will provide a navigation option for aircraft arriving from this direction; however, traffic is anticipated to be light.

Volume estimates, based on 2016 traffic patterns, provide information on how many...
aircraft typically arrive from each direction.

While distribution of traffic is anticipated to continue, the new RNP AR approach (in blue, Figure 2) will allow many equipped aircraft to turn sooner than they might have otherwise and will result in a smaller number of aircraft completing their turn over a wide region. The proposed approaches are located amongst existing traffic patterns and at comparable altitudes. Aircraft not equipped for RNP will continue to approach the airport in a similar fashion as today, using RNAV standard arrivals as well as visual approaches.

Figure 2: Proposed RNP approaches and Traffic Sample

Figure 3 shows the composite proposed RNP approach paths in blue and the current private RNP approach in black. There is currently one RNP approach path for runway 13. Both bring aircraft over low population density areas before turning towards the airport. The private approach to runway 13 is currently in use but would be revoked when the proposal approaches are published.

Figure 3: Current private RNP approach and proposed approach
Noise Modelling – Runway 13

Figures 4 and 5 show a composite noise contour for the proposed standard arrivals and RNP approaches paths to runway 13. Contours show maximum noise levels along the flight path. In this instance the model uses a 737-800\(^1\) aircraft, a type of aircraft seen frequently at the airport.

While the contours are static, noise events are temporary. The contours show only the impacts of the proposed standard arrival and RNP routes; other aircraft will continue to be a part of the soundscape.

\(^1\) Many aircraft that are used at the airport are quieter than the 737-800. Turboprop aircraft such as the Q400 and new generation jets such as the A320NEO, C-Series and 737MAX are projected to be significantly quieter.
3.2 Runway 18 Arrivals & Proposed Flight Paths

Runway 18 receives approximately 30 per cent of arrivals on an annual basis. It is frequently used in conjunction with runways 13 and 31.

Figure 6 shows a composite of the proposed STAR structure for runway 18 (in blue) with a 24-hour sample of arrival traffic as flown by aircraft on October 25, 2016 (in turquoise). The new standard arrival routes will continue to have aircraft intercept the final approach – the point where the aircraft must line up with the runway – at around 10 nautical miles.

Volume estimates, based on 2016 traffic patterns, provide information on how many aircraft typically arrive from each direction.

While some distribution of traffic is anticipated to continue, the new RNP AR approach (in blue, Figure 7) will allow many equipped aircraft to turn sooner than they might have otherwise and will result in a smaller number of aircraft completing their turn over a wide region.

The RNP transitions from the west and northwest avoid densely populated area. Increased RNP usage would benefit Stonewall in this instance as more aircraft would be able to turn towards the airport sooner, thereby avoiding the municipality. From the northeast, the flight path overflies populated areas in the same location as today while aircraft from the east will be in a slightly different location; however, the volume is expected to be low initially at approximately 300 flights/year.

The proposed approaches are located amongst existing traffic patterns and at comparable altitudes Aircraft not equipped for RNP will continue to approach the airport in a similar fashion as today, using RNAV standard arrivals as well as visual approaches.
Figure 8 shows the composite proposed RNP approach paths in blue and the current private RNP approach in black. There are currently two RNP approaches for runway 18. Both bring aircraft over low population density areas before turning towards the airport.

Both private approaches would be revoked if the proposed approaches are implemented.
Noise Modelling – Runway 18

Figures 9 and 10 show a composite noise contour for the proposed standard arrivals and RNP approaches paths to runway 18. Contours show maximum noise levels along the flight path. In this instance the model uses a 737-800 aircraft, a type of aircraft seen frequently at the airport.

While the contours are static, noise events are temporary. The contours show only the impacts of the proposed standard arrival and RNP routes; other aircraft will continue to be a part of the soundscape.
3.3 Runway 31 Arrivals & Proposed Paths

Runway 31 receives approximately 28 per cent of arrivals on an annual basis. It is frequently used in conjunction with runways 18 and 36.

Figure 11 shows a composite of the proposed STAR structure for runway 31 (in blue) with a 24-hour sample of arrival traffic as flown by aircraft on October 19, 2016 (in turquoise). The new standard arrival routes will continue to have aircraft intercept the final approach – the point where the aircraft typically line up with the runway – at around 10 nautical miles. The most significant change will be the addition of a flight path from the north that overflies the eastern part of Winnipeg. While the flight path is located amongst existing flight patterns, a portion will fly the new downwind leg. In designing the approach, commercial and industrial spaces were utilized. As a result, the segments of the new flight path that would see aircraft overfly residential areas will have most aircraft at altitudes of 6,000’ and above.

Volume estimates, based on 2016 traffic patterns, provide information on how many aircraft typically arrive from each direction.

While some distribution of traffic is anticipated to continue, the new RNP AR approach (in blue, Figure 12) will allow many equipped aircraft to turn sooner than they might have otherwise and will result in a smaller number of aircraft completing their turn over a wide region. The proposed approaches are located amongst existing traffic patterns and at comparable altitudes.

The transitions from the west and northwest will see aircraft completing their arc towards the airport just south of the city and in a location very similar to the current private approach. The right hand arc from the north is expected to see very little usage initially as most aircraft from this direction are not equipped for RNP. Aircraft not equipped for RNP will continue to approach the airport in a similar fashion as today, using RNAV standard arrivals as well as visual approaches.
Figure 13 shows the composite proposed RNP approach paths in blue and the current private RNP approach in black. There are currently two RNP approaches for runway 31. Both bring aircraft over low population density areas before turning towards the airport.

A private left hand approach to runway 31 is currently in use but would be revoked when the proposal approaches are published.
Noise Modelling – Runway 31

Figures 14 and 15 show a composite noise contour for the proposed standard arrivals and RNP approaches paths to runway 31. Contours show maximum noise levels along the flight path. In this instance the model uses a 737-800 aircraft, a type of aircraft seen frequently at the airport.

While the contours are static, noise events are temporary. The contours show only the impacts of the proposed standard arrival and RNP routes; other aircraft will continue to be a part of the soundscape.
3.4 Runway 36 Arrivals & Proposed Paths

Runway 36 receives approximately 27 per cent of arrivals on an annual basis. It is frequently used in conjunction with runways 13 and 31.

Figure 16 shows a composite of the proposed STAR structure for runway 36 (in blue) with a 24-hour sample of arrival traffic as flown by aircraft on October 10, 2016 (in turquoise). The new standard arrival routes will continue to have aircraft intercept the final approach – the point where the aircraft typically line up with the runway – at around 10 nautical miles. The most significant change for this runway will be the addition of a flight path from the north; the flight path passes over parts of Winnipeg. While the flight path is located amongst existing flight patterns, aircraft will fly the downwind leg with more consistency. Aircraft on the downwind leg will be above 5,000’.

Volume estimates, based on 2016 traffic patterns, provide information on how many aircraft typically arrive from each direction.

While some distribution of traffic is anticipated to continue, the new RNP AR approach (in blue, Figure 17) will allow many equipped aircraft to turn sooner than they might have otherwise and will result in a smaller number of aircraft completing their turn over a wide region. The proposed approaches are located amongst existing traffic patterns and at comparable altitudes.

The transitions from the west and northwest will see aircraft completing their arc towards the airport mostly over agricultural areas and in a location very similar to the current private approach. Compared to the current private approach, the proposed approach will help RNP equipped aircraft better avoid overflight of Oak Bluff. The right hand arc from the north is expected to see very little usage initially as most aircraft from the north are not equipped for RNP.

Aircraft not equipped for RNP will continue to approach the airport in a similar fashion as today, using RNAV standard arrivals as well as visual approaches.
Figure 18 shows the composite proposed RNP approach paths in blue and the current private RNP approach in black. There are currently two RNP approaches for runway 36. Both bring aircraft over low population density areas before turning towards the airport.

Private left hand approach to runway 36 is currently in use but would be revoked when the proposal approaches are published.
Noise Modelling – Runway 36

Figures 19 and 20 show a composite noise contour for the proposed standard arrivals and RNP approaches paths to runway 36. Contours show maximum noise levels along the flight path. In this instance the model uses a 737-800 aircraft, a type of aircraft seen frequently at the airport.

While the contours are static, noise events are temporary. The contours show only the impacts of the proposed standard arrival and RNP routes; other aircraft will continue to be a part of the soundscape.
4.0 Environmental Assessment

4.1 Overall Impact on Community Noise

The overall community noise impact of the proposed changes is anticipated to be low based on the following:

- **Many RNP approaches avoid residentially populated areas.** Approaches to runways 13 and 18 are largely over agricultural areas.

- **Most of the RNP approaches are located amongst existing traffic patterns and reduce the total area overflown when compared to conventional approaches.** With shorter transitions on to the final approach, these flight paths can represent a reduction in area overflown and in some cases avoid overflight of entire communities that otherwise would observe the same flight on a conventional approach. For communities that are overflown by the proposed RNP AR flight path, some increase in the amount of daily traffic experienced can be expected. However, the overall utilization of RNP AR is expected to continue to be a relatively small proportion of overall traffic due to both equipage levels and the sequencing requirements of traffic – as is the case for those approach arcs that overfly the south of Winnipeg.

- **RNP AR provides aircraft with guidance for constant descent operations.** The 3 degree descent gradient that RNP AR provides should result in reduced noise as compared to equivalent flights that require aircraft to fly a level segment before intercepting the final approach glide path. Constant descent has been shown to reduce single event noise by 1-5 dB in portions of the flight path.²

- **New STARs from the north overfly the city at high altitudes.** New approaches intended to streamline traffic from the North are amongst existing traffic patterns, utilize commercial and industrial space where possible and will keep aircraft at higher altitudes above populated areas, above 5,000'.

The most perceptible aircraft noise events in the Winnipeg region will continue to be related to departures; no changes are proposed for initial departure headings. It is important to note that the proposed changes have no effect on zoning restrictions.

4.2 Reduced Emissions

The implementation of PBN in Canada is an objective of Canada’s Action Plan to Reduce Greenhouse Gas Emissions from Aviation (2012), due to its potential to reduce fuel burn and associated emissions from aircraft operations. The Action Plan was the Government of Canada’s response to the International Civil Aviation Organization’s (ICAO) Assembly Resolution A37-19, which encourages Member States to submit national plans detailing the measures they are taking to address aviation emissions.

In addition to safety benefits for pilots and controllers resulting from improved predictability of operations during one of the busiest phases of flight, it is estimated that the earlier turns off of the downwind leg at Winnipeg Richardson International Airport will reduce flying time by up to three minutes per flight. Over the course of a year, this is equivalent to approximately 300,000 litres of fuel savings and a reduction of 800 metric tonnes of greenhouse gas emissions³. That’s the same as approximately 9,000 car trips from Winnipeg to Brandon, MB.

---


³ Estimate based on 2016 equipage rates and is expected to grow over time.
5.0 Community Outreach and Engagement

5.1 Engagement with Airport

NAV CANADA’s design team worked with the airport’s operations staff at the early stages of design to ensure their knowledge of the local community was taken into consideration, as per the industry’s Airspace Change Communication and Consultation Protocol. Several changes were implemented in the early design phases as a result of airport input, at times trading off some time, distance and GHG benefits to improve environmental noise. An example of this was pushing arcs to runways 31 and 36 further south than optimal from a flight profile basis to better avoid populated areas. Two meetings were held with the airport’s Committee on Environment related to the topic of RNP, the latter providing an overview of proposed designs and seeking input on the consultation methodology. The membership of the committee is comprised of airport, NAV CANADA, Transport Canada representatives as well as a municipal official. The consultation approach was adjusted with feedback from the noise advisory committee; including adjustments to which publications to include for printed notices and the addition of outreach to provincial-level elected officials.

5.2 Website

All meeting materials were made available online at www.navcanada.ca/ywg on February 15, 2017. Consultation information included a description of the changes, including maps of existing air traffic, the proposed flight paths, noise information and access to a video explaining RNP AR technology.

The page also provided notice regarding the date, time and location of open house events and access to the feedback mechanism, consisting of a survey with open and close ended questions.

Webpage analytics shows that this section of the website received more than 1,500 unique visitors.

5.3 Open House Events

A total of three open house events were held in communities surrounding the airport. This provided the public with opportunities to learn about proposed changes in person, to ask questions directly to NAV CANADA personnel and provide input for consideration in the final flight path design.

The Open House events were hosted in community centres and hotel halls offering large, open spaces. NAV CANADA representatives were available throughout to explain proposed changes, discuss current and expected flight patterns and answer resident questions. Attendees were invited to provide their name on a sign-in sheet for tracking purposes, though some attendees at each event preferred not to provide personal information. To explain the proposed changes, large boards were printed containing information on NAV CANADA, Winnipeg Richardson International Airport, RNP AR technology as well as maps showing current tracks and the proposed RNP AR flight paths as well as noise modeling. Other resources available during the open house included two computer stations staffed by subject matter experts who helped residents to locate their residence on a Google Earth map and interpret changes specific to their location.

The following table provides the date, time and location of consultation events (characterization of the types of verbal feedback received is available in section 6.3).
To ensure community awareness of the consultation effort, notices (sample in Appendix 2) were placed in the Winnipeg Free Press and Metro Winnipeg as well as The Sou’Wester, The Lance, The Herald, The Headliner, The Teulon Stonewall Tribune and La Liberté. The combined distribution of the publications surpassed 322,000 per insertion, with a total of three insertions for most publications. Notices included information on dates and locations for the community open house events and encouraged residents to visit the website. In addition, the effort garnered earned media in the Winnipeg Free Press, The Headliner, The Sou’Wester, CBC and CTV broadcast news and 680 AM news. Some elected officials helped promote the consultation effort through their own social media channels (samples in Appendix 3).

5.4 Briefings for Elected and Senior Administrative Officials

Individual Briefings

Federal, provincial and municipal elected and administrative officials were contacted in regions that were near proposed flight paths. Tailored, in-person briefings were delivered to three Federal MPs, four provincial MLAs and two city councillors. Written briefings were provided for two municipal councillors and one MLA.

Elected officials were typically appreciative of the effort to inform and were favourable of changes that would result in minimal impacts or improvements for their constituents. Several indicated that they were happy to have a contact to direct inquiries to should they receive questions if/when implemented.

6.0 Survey Results and Other Feedback

6.1 Methodology

To garner consistent feedback, a survey containing a mix of closed- and open-ended questions was made available on the website and at community events. Surveys filled out by residents at the Open House and left behind with staff were entered into the survey tool and considered along with those entered online.

6.2 Survey Respondents

A total of 221 individuals completed the survey. Figure 21 shows the approximate location* of respondents based on postal code information provided. Note that approximately a third of respondents
provided data that was not readily identifiable on Google Earth. The green house icon identifies the locations of the consultation events, which were open to residents across the region.

Figure 21: Approximate Location of Survey Respondents

6.3 Summary of Input Received

The engagement effort related to new RNP AR procedures revealed that a majority of residents were opposed to flight path changes. Specific reasons for opposing the changes were quite varied. Many residents expressed fairly high-level explanations, showing general apprehension towards the proposal.

The yellow points on the map show the approximate location of survey respondents while the green icons show the location of open house event. Note that not all respondents provided identifiable addresses while five resident locations are outside of the area shown.

A number of small location-based clusters are evident using address and postal code data to map respondent’s location. Clusters were evident in the boroughs of Bridgewater, Assiniboia, St-James, River Heights and Elmwood.

Comparing the 60 dBA and above footprint of all approaches (including those segments where there are no changes) shows that approximately 70 per cent of respondents reside outside the contours.

Approximately 40% of survey respondents indicated that they have concerns with existing aircraft noise. Most respondents cited commercial jets and turboprops as the main source of aviation noise. When asked what type of operation was the source of the concern, residents mentioned both aircraft on arrival (67%) and aircraft on departure (53%) – the latter which are proven to be louder. A significant number of people (67%) expressed concerns with night operations, such as early morning cargo flights.
Overall, the proportion of people concerned with current aviation noise events does not correlate with very low complaint numbers received by the airport, implying that residents are not concerned enough to contact the airport. It is possible that the survey methodology can be improved with the potential that respondents who would like to voice concerns on the proposed change are doing so at the first opportunity in the survey, which focuses on current experience versus response to the proposal.

A total of 59 per cent of survey respondents indicated that they expected noise to increase if the proposal were implemented, while 33 per cent expect it to stay the same and 8 per cent expect it to decrease. Reasons cited by respondents expecting an increase in noise as a result of the proposal included that the flight path will be closer to their residence (48 respondents), general opposition without further elaboration (28 respondents) and concern with growth in traffic levels to the airport (16 comments).

Open ended comments touched on a fairly wide range of topics, the most prevalent being:

- The designs should avoid populated areas/go over industrial/rural areas or prioritize community noise impacts (20 comments).
- General opposition to any flight path changes was expressed (16 comments)
- Some respondents provided feedback on how to improve the consultation materials themselves (14 comments)
- Concerns related to safety/health impacts (9 comments) as well as perceived negative impacts on home values (8 comments)
- Several comments mentioned displeasure with current aircraft operations (12 comments)
- Some respondents indicated they viewed the changes favourably due to benefits on community noise or the environment (14 comments)
- Some respondents further indicated that they were neutral to the changes (10 comments)
- Other comments include concerns related to night operations, denser flight paths, and current aircraft operations as well as support for reducing fuel burn.

In addition, the following table characterizes the feedback we received at respective open house events. All participants were requested to provide their official feedback via the survey mechanism though it was not unusual for residents to decline to fill the survey, particularly if changes had little or no impact on them. Many of the comments at the three events related to military training aircraft and night time cargo flight departures – both unrelated to proposed changes.

<table>
<thead>
<tr>
<th>Event</th>
<th>Summary</th>
</tr>
</thead>
</table>
| March 8, 2017 – 6:30 to 8:30 p.m.  
Headingley Community Centre  
5353 Portage Ave  
Headingley, MB  
R4H 1J9 | This event was in a location where the proposal would result in laterally shifting a downwind leg by approximately 1 NM. The event was lightly attended (~20 residents). Residents were reassured by the fact that proposed changes are at higher altitudes (‘7,000’). Most residents of the area stand to benefit as the proposal will bring traffic away from the most populated area of this municipality. |
| March 9, 2017 – 7:00 to 9:00 p.m.  
Valley Gardens Community Centre  
218 Antrim Rd  
Winnipeg, MB  
R2K 3L2 | The event in East Kildonan reached residents on the north east side of Winnipeg. The focus for this location was a new STAR from the north where there wasn’t one before. This event received approximately 40 participants. Some residents were initially vocal about the format, but were in the end satisfied with the time spent to explain the changes. A few residents (and elected officials) mentioned early a.m. cargo flights as a source of annoyance while others felt that changes had already been implemented. |
| March 18, 2017 – 1:00 to 3:00 p.m.  
Four Points by Sheraton Winnipeg South  
2935 Pembina Highway  
Winnipeg, MB  
R3T 2H5 | This event was held in in St-Norbert to reach neighbourhoods to the south of the city. The focus was proposed approaches to runways 31 and 36. Approximately 35-40 residents, mostly a mix of people located near one of the proposed arcs/downwinds or under the final approach to 31. Many participants seemed relieved when impacts were qualified, but some expressed opposition to the changes. Members of the Model Aeronautics Association Of Canada (MAAC), who had an interest in RNP and viewed it positively, were also in attendance. |
6.4 Consideration of Main Mitigations Proposed by Residents

Some clusters of respondents viewed the change neutrally or as a benefit, while others were apprehensive. Generally, mitigation was voiced in high level concepts such as a request to avoid overflight of one’s neighbourhood.

NAV CANADA is sensitive to the fact that overflight of residential areas can be perceived as a nuisance for residents. As such, it makes efforts to balance the requirements for safe navigation, the interests of surrounding communities and the need to reduce the environmental impact of the industry.

Unfortunately, due to the location of airports in relation to communities, flight path design criteria and safety requirements, it is not always possible to avoid overflying residential areas. This is particularly true of locations that line up with the runway extended centerline, as aircraft must line up with the runway on final approach. Other criteria, traffic mix and aircraft performance limitations affect turn radii and altitudes that limited design options in locations that are seemingly far away from the airport.

Where possible, the company endeavors to design flight paths that overfly commercial or non-residential areas in a manner that respects Transport Canada-approved design criteria.

In this manner, the company has been able to propose flights paths that minimize community impacts while recognizing safety and environmental imperatives.

7.0 Recommendation

RNP AR procedures have been flown at Winnipeg International Airport since 2007 and have not been a source of noise complaints in the past. In addition, several of the RNP approach paths are located over non-residential areas. The use of RNP by a private operator at the airport has been successful in providing a shorter flight path and reducing emissions. The proposed RNP AR design ensures approaches to all runways and will be able to be utilized by other suitably equipped and certified operators. The new STARs from the north strategically lever non-residential space where possible while keeping aircraft at higher altitudes over residential areas.

It is recommended that the proposed STAR structure and RNP AR procedures for Winnipeg International Airport be implemented as proposed. A target implementation date in October 2017 should be identified.

Implementation will be subject to review as per section 9.0.

8.0 Communication

As per the Airspace Change Communications and Consultation Protocol, NAV CANADA will communicate the decision by posting this study on the NAV CANADA website at least three weeks prior to implementation. Pilot publications will be updated to reflect the new procedures as required.

9.0 Post Implementation Review

An assessment of the change will be made by NAV CANADA and the Airport operator to analyze operations and impacts of the first 180 days following implementation of the new STAR structure and RNP AR approaches. This assessment will include noise monitoring to determine actual decibel levels in the affected area. The review will be shared with the Airport Authority and published on NAV CANADA’s website. Noise monitoring will target the most used flight paths that overfly residential areas beyond final approach areas.
APPENDIX 1 – Other Noise Contours

Composite noise contour for current private RNP approaches (approaches to be rescinded)
Contours of other sample approaches

Left hand visual approach to runway 18

Left hand visual approach to runway 31

Right hand visual approach to 31

Right hand STAR approach to 36
APPENDIX 2 – Sample Notice

Below is a sample notice that was published in the Winnipeg Free Press.

Notice of Community Consultation

NAV CANADA proposes airspace improvements for Winnipeg International Airport

NAV CANADA is seeking public input on proposed changes to aircraft arrival and departure procedures at Winnipeg James Richardson International Airport.

Updates to standard arrival routes as well as the implementation of new technologies are planned as part of the proposal. The proposed flight paths are estimated to save up to three minutes flying time for arrivals, with greenhouse gas emissions reductions estimated at 800 metric tonnes each year.

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.

Proposed updates to departure procedures will allow for the use of satellite navigation while following the same initial departure headings used today.

NAV CANADA has made information, including maps, on proposed flight path changes available online at navcanada.ca/YWG. Residents are invited to learn about changes and provide feedback by April 2, 2017 using the comment tool available on the website.

Residents of Winnipeg and surrounding communities can also attend any of the following drop-in Open House Consultation Events:

March 8, 2017 – 6:30 to 8:30 p.m.
Headingly Community Centre
5353 Portage Ave
Headingly, MB
R4H 1J9

March 9, 2017 – 7:00 to 9:00 p.m.
Valley Gardens Community Centre
218 Antrim Rd
Winnipeg, MB
R2K 3L2

March 18, 2017 – 1:00 to 3:00 p.m.
Four Points by Sheraton South Winnipeg
2935 Pembina Highway
Winnipeg, MB
R3T 2H5
APPENDIX 3 - Sample social media posts.

Janice Lukes
@janicelukes

StNorbert & FtRichmond residents-NAV CANADA is changing flight paths & holding OPEN HOUSE Sat March 18 janicelukes.ca/?p=8530

7:36 AM · 1 Mar 2017

Brian Gilchrist, Jon Rayes, MLA, Sarah Guilmard and 2 others

Scott Gillingham
@ScottGillingham

#NavCanada is changing flight paths over WPG & is holding an open houses, incl Mar 8, 6:30-8:30p.m at Headingley Community Centre.
#wpgpoli

8:01 AM · 1 Mar 2017 · Twitter for iPhone

Winnipeg, Manitoba, Canada

1 REPLY 3 RETWEETS 2 LIKES

Bridgewater Lakes Community
March 24

Message via the Neighbourhood Association:
New proposed flight paths would see more traffic over the Neighborhoods of Bridgewater. Nav Canada is looking for feedback from affected residents until April 2, 2017.
Here's some background information:
http://www.winnipegfreepress.com/.../Charting-new-paths-in-th... http://www.navcanada.ca/.../YWG%20Airspace%20Proposa%20Packa... And the online feedback form is here: https://www.surveymonkey.com/r/QQ65VQ2
They are accepting feedback until APRIL 2ND.

Charting new paths in the sky
Nav Canada is changing its approach and is looking for feedback from the community. The air navigation service provider is proposing changes to some flight paths in Winnipeg's airspace as more planes are outfitted with technology that reduces flight...

Jon Rayes, MLA @jonreyes204 28m
Earlier today met with Nav Canada about airspace improvements for @YWGairport & flight paths over St. Norbert. bit.ly/Zxp0fJl.

Headliner @CanstarHeadline 4h
NAV Canada announces possible changes to arrival routes at Winnipeg's airport: winnipegfreepress.com/our-communit... #cbn