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# NAV CANADA and Airspace Change

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# Overview

- NAV CANADA and Airspace Change
- Non-acoustic factors that impact our work
- Noise mitigation through PBN





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# About NAV CANADA



- Canada's Air Navigation Services Provider
- Private, not-for-profit organization
- One of the largest in the world in terms of aircraft movements
- ~5,000 employees at more 100 corporate and operational sites





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# Airspace Change Context

- Well in to a significant airspace modernization program.
- Driven by our State Mandate, informed by ICAO Aviation System Block Upgrades (ASBU).
- NavAid modernization program – shift from ground-based to satellite-based infrastructure.
- 16 airports in the last three years, where we have deployed PBN improvements including RNP-AR







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# Airspace Change Process

## Integration of our teams and stakeholders

- Deployment Team and Stakeholder Relations work closely together from the beginning.
- Airport and airline involvement participation.
- Community Consultation on airspace proposals.



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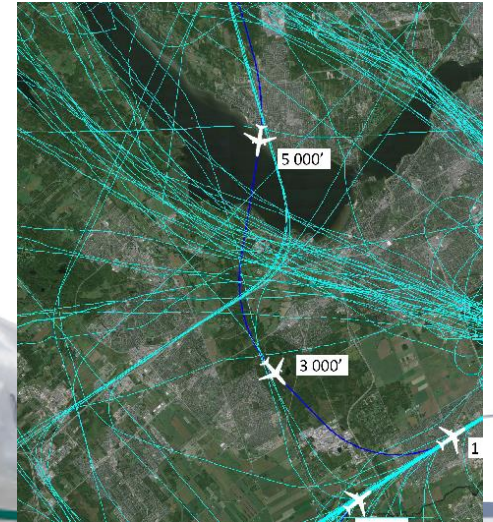


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# PBN Opportunities

- Increase use of quieter continuous descent operations.
- Better avoidance of residentially populated areas in some cases.





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# Non Acoustical Challenges

- Range of individual concern can vary in relation to expected/actual level of exposure.
- An information/understanding vacuum can be easily be filled with apprehension or misinformation.
- It can take time for real improvements to the noise environment to result in improved community perception.





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# Non Acoustical Opportunities

- Work with community leaders to increase understanding and awareness. Many are investing significant time to understand a technical subject, and in some cases, have industry experience.
- Find ways to be accessible to community members so that a conversation can occur.
- Measure, but also share the positive efforts.





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# Positive Results: Toronto Pearson

- Spring of 2018 public consultation: 6 Ideas to reduce the impacts of aircraft noise.
- Conducted jointly with the Greater Toronto Airports Authority.
- New nighttime procedures; Procedures that increase use of CDO; Runway utilization
- Follows significant community dialogue, including community members with industry experience.
- 15 open house events across the region
- Significant promotion: Notices; Social Media; Automated Calls





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# Noise Mitigation Using PBN

- PBN does bring potential challenges with repeatability, but this can also be a valuable noise mitigation tool if used appropriately
- “Hybrid” procedures can provide balance between PBN gains and dispersion where required/possible
- PBN approach procedures will result in better CDO performance. The resulting increase in altitude/quieter aircraft profile providing noise mitigation





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# Toronto Pearson: New nighttime RNAV arrivals

## Goals

- Minimize use of the downwinds at night
- Create RNAV approaches that incorporate quieter, continuous descent to the runway
- Design approaches to overfly greenbelt and industrial areas, where possible
- Ensure designs are user friendly for both ATC and customers, to maximise usage





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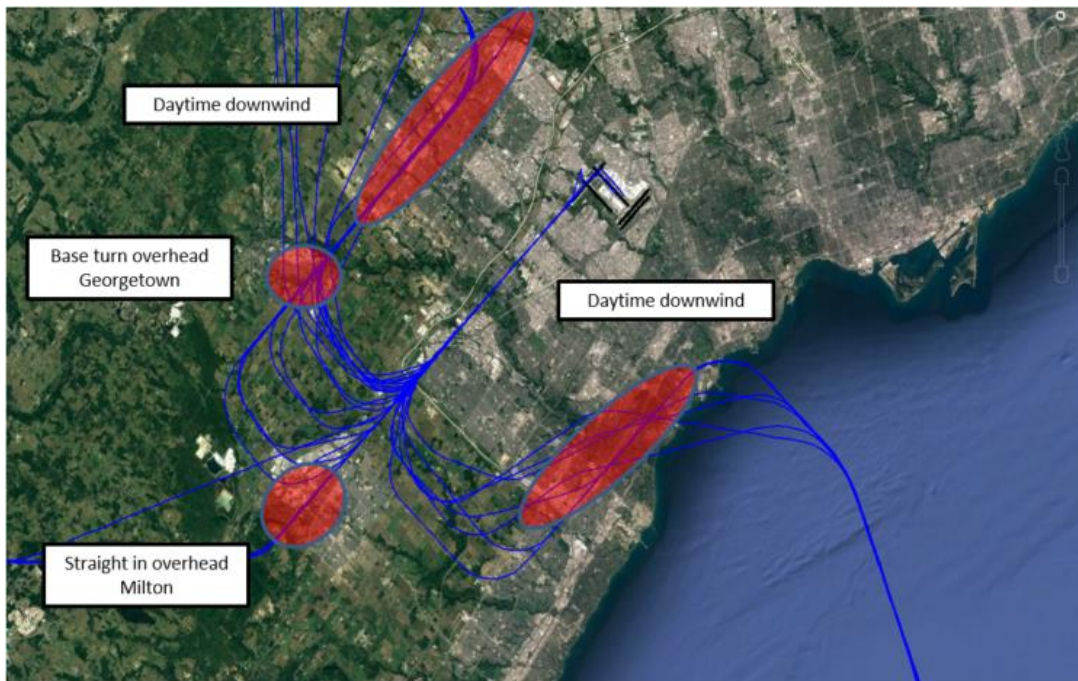
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# Toronto Pearson: New nighttime RNAV arrivals





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# Toronto Pearson: New nighttime RNAV arrivals





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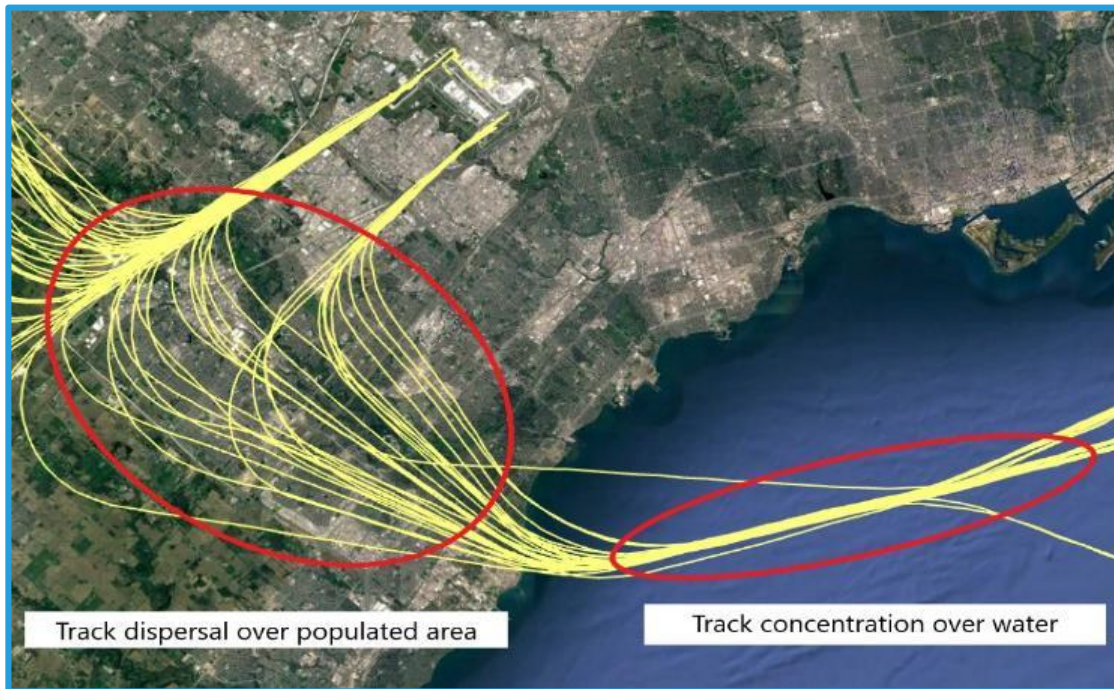
# New RNAV Designs: Runway 23

- Changes in population overflown\*
  - 55 dB – 42% reduction (268,700 less people)
  - 60 dB – 30% reduction (80,830 less people)
- Changes in number of houses overflown\*
  - 55 dB – 125,800 less houses
  - 60 dB – 36,960 less houses

\*Comparison between average/most common existing night approach and Concept RNAV based on 2011 Census data



# Hybrid RNAV SIDs







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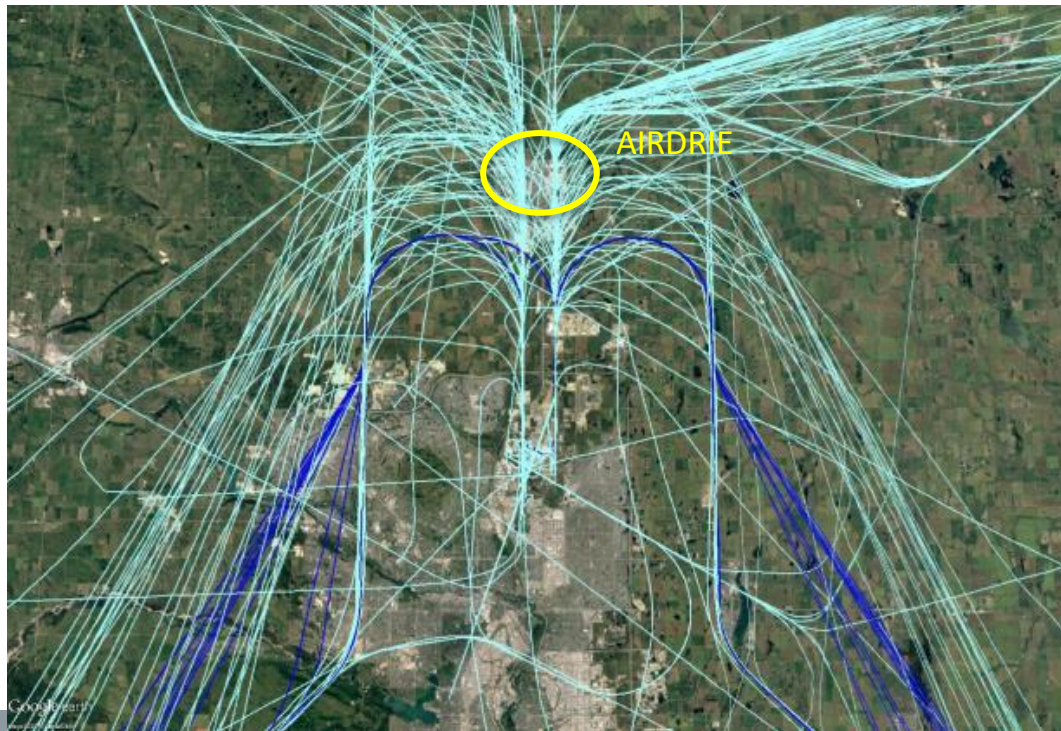


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# RNP-AR Approaches to Calgary





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