



Canadian PBN Implementation

ICAO PBN Symposium

October 16th, 2012

S E R V I N G A W O R L D I N M O T I O N





Briefing points

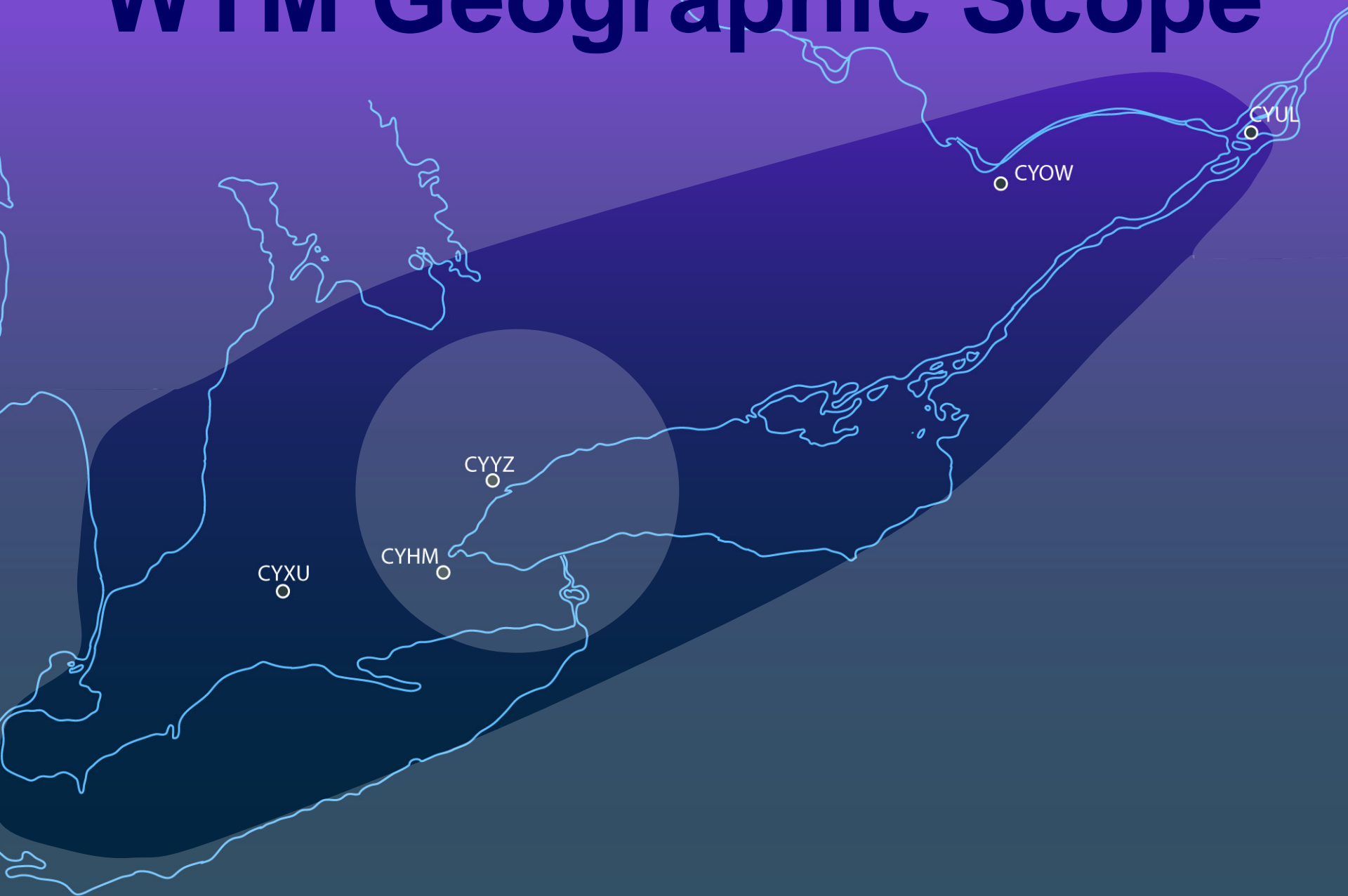
- Examples of Canadian PBN implementation
 - Total system approach
 - Business case analysis
 - Collaborative development

Windsor-Toronto-Montreal (WTM) Airspace Redesign – Project Objectives

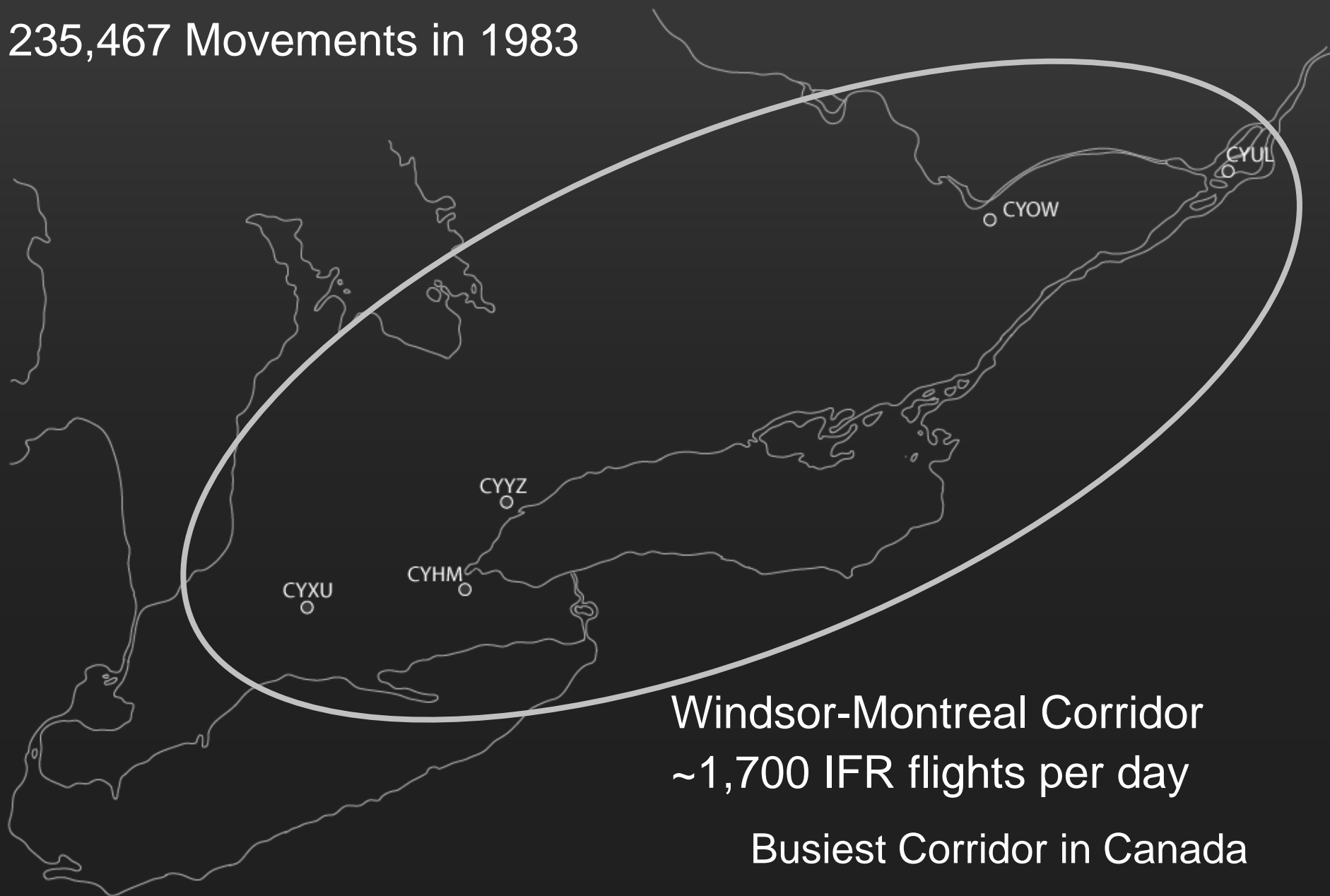
Enhance the efficiency of operations through the optimization of airspace design and technology while maintaining safety



WTM Geographic Scope



CYYZ – Toronto Pearson
235,467 Movements in 1983



Windsor-Montreal Corridor
~1,700 IFR flights per day

Busiest Corridor in Canada

CYYZ – Toronto Pearson

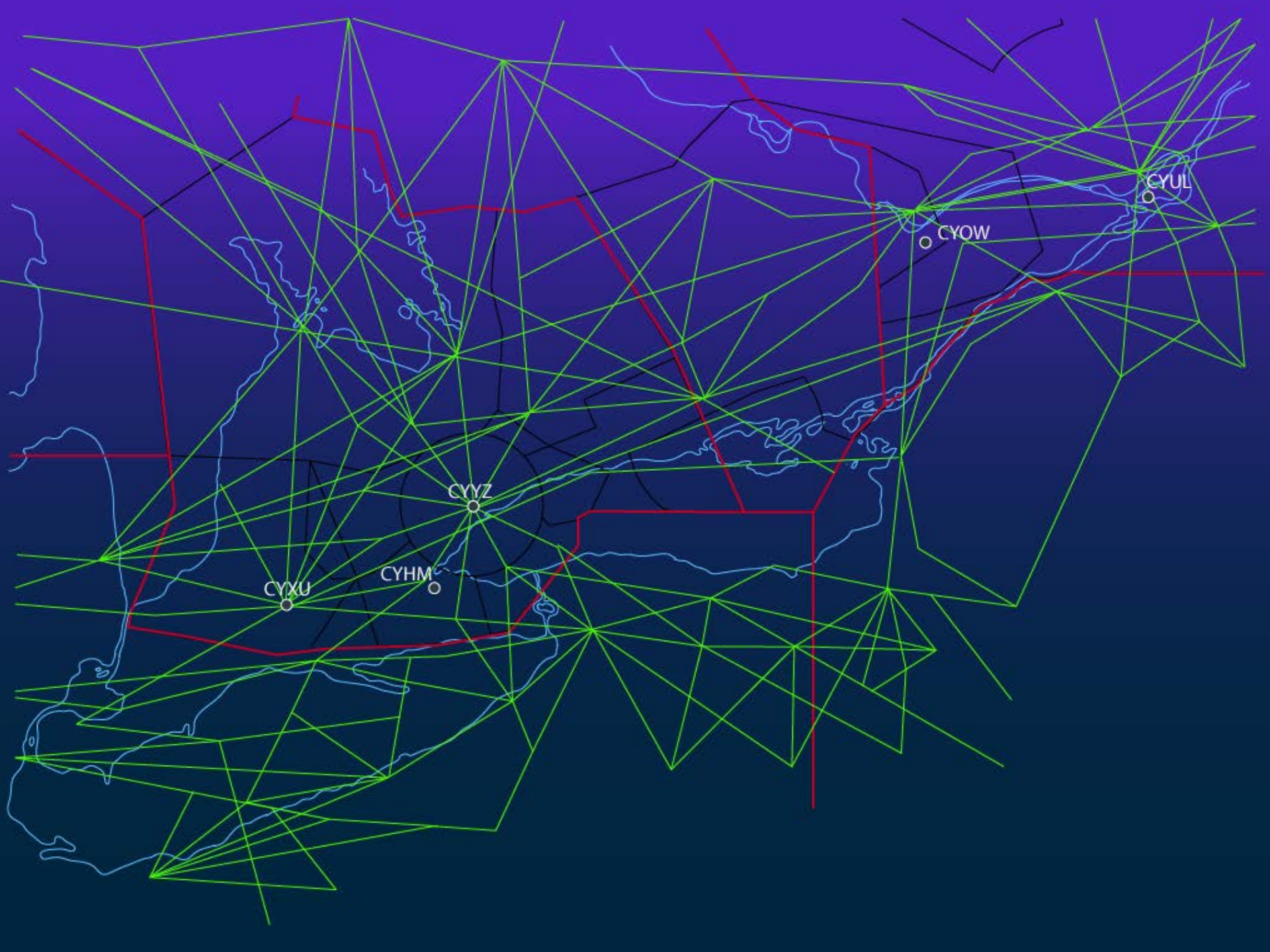
430,000 Movements in 2011

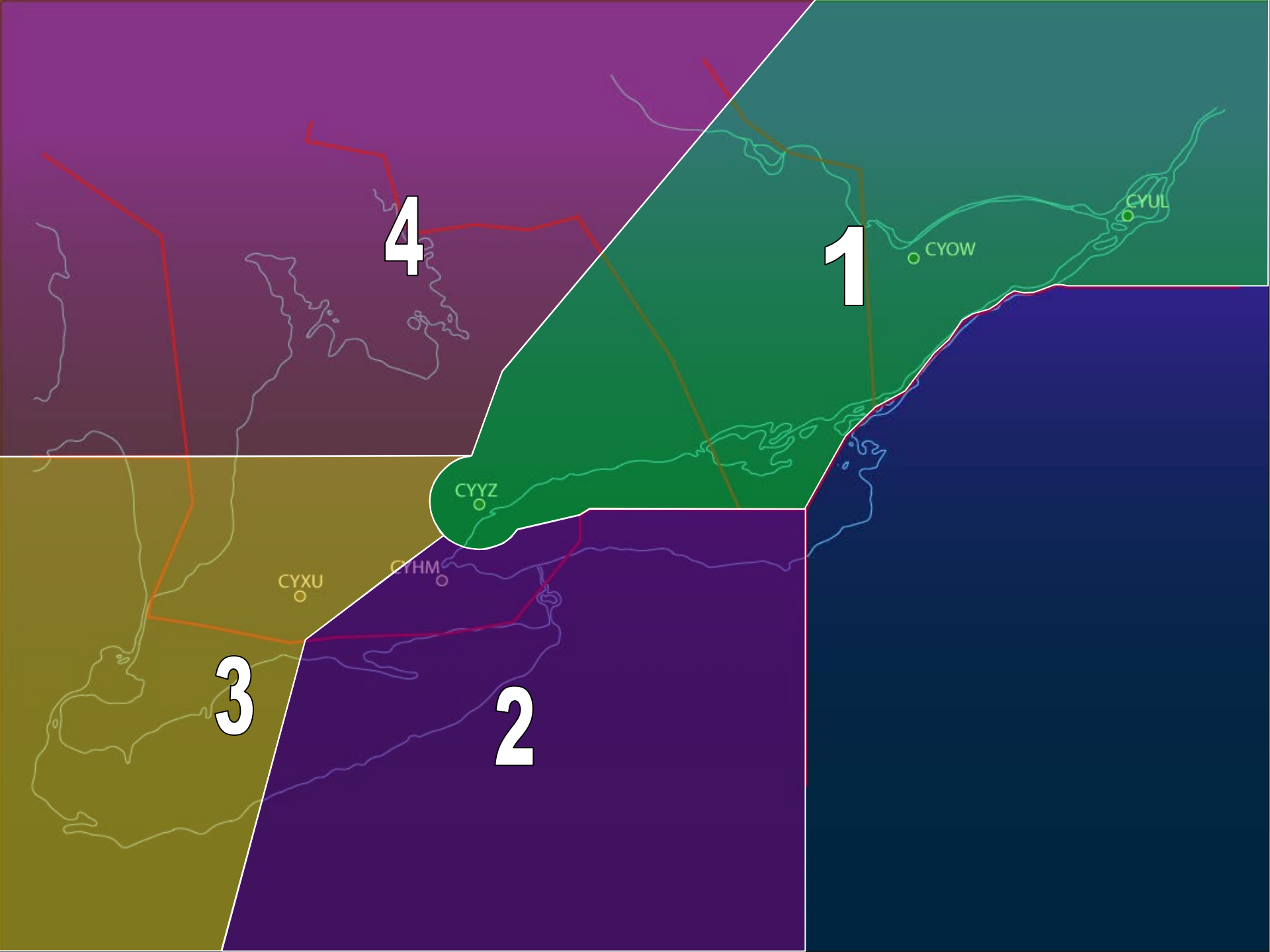
- 18th Busiest Airport in the World
- Busiest Airport in Canada

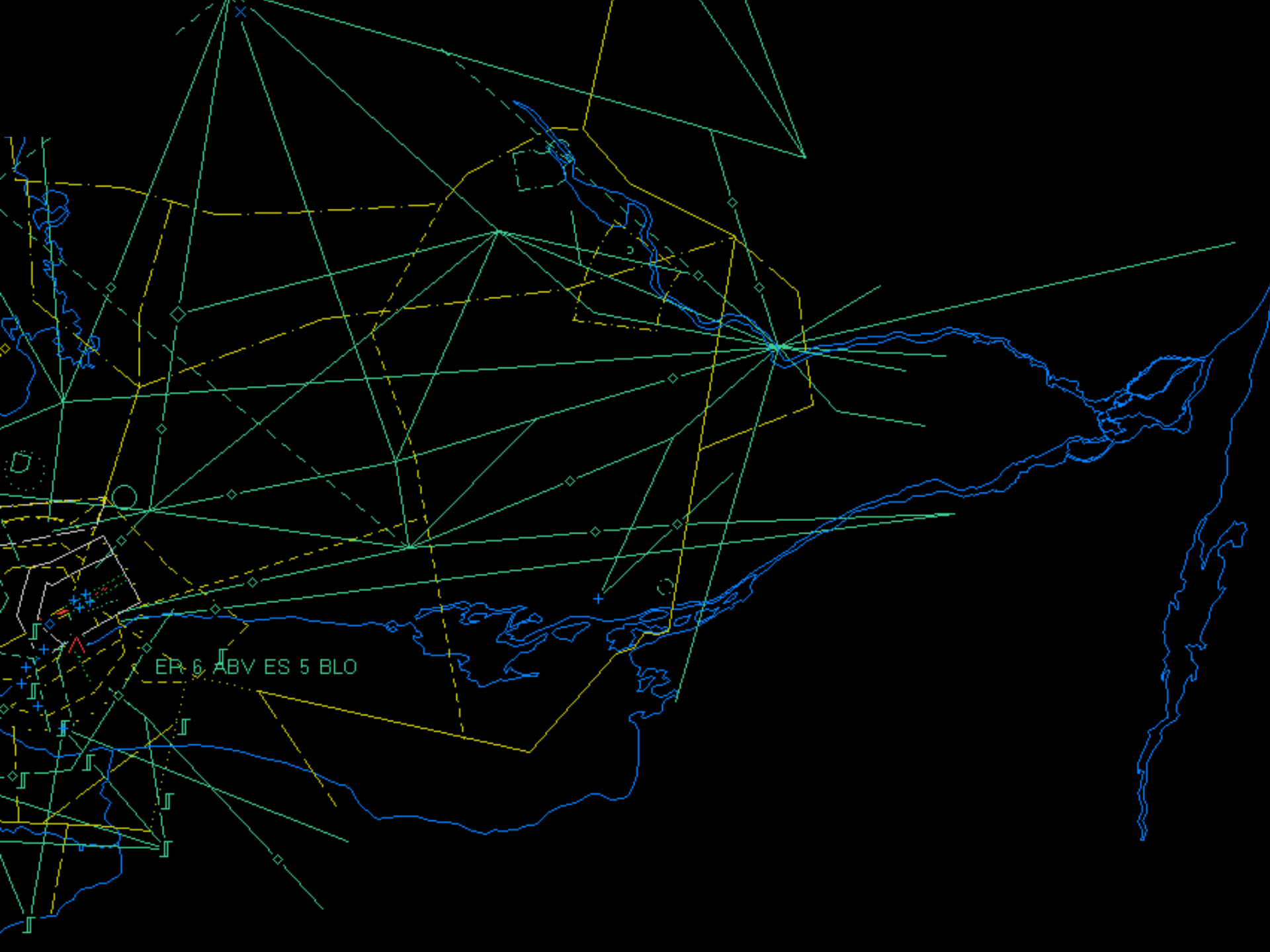


Windsor-Montreal Corridor
~3,000 IFR flights per day

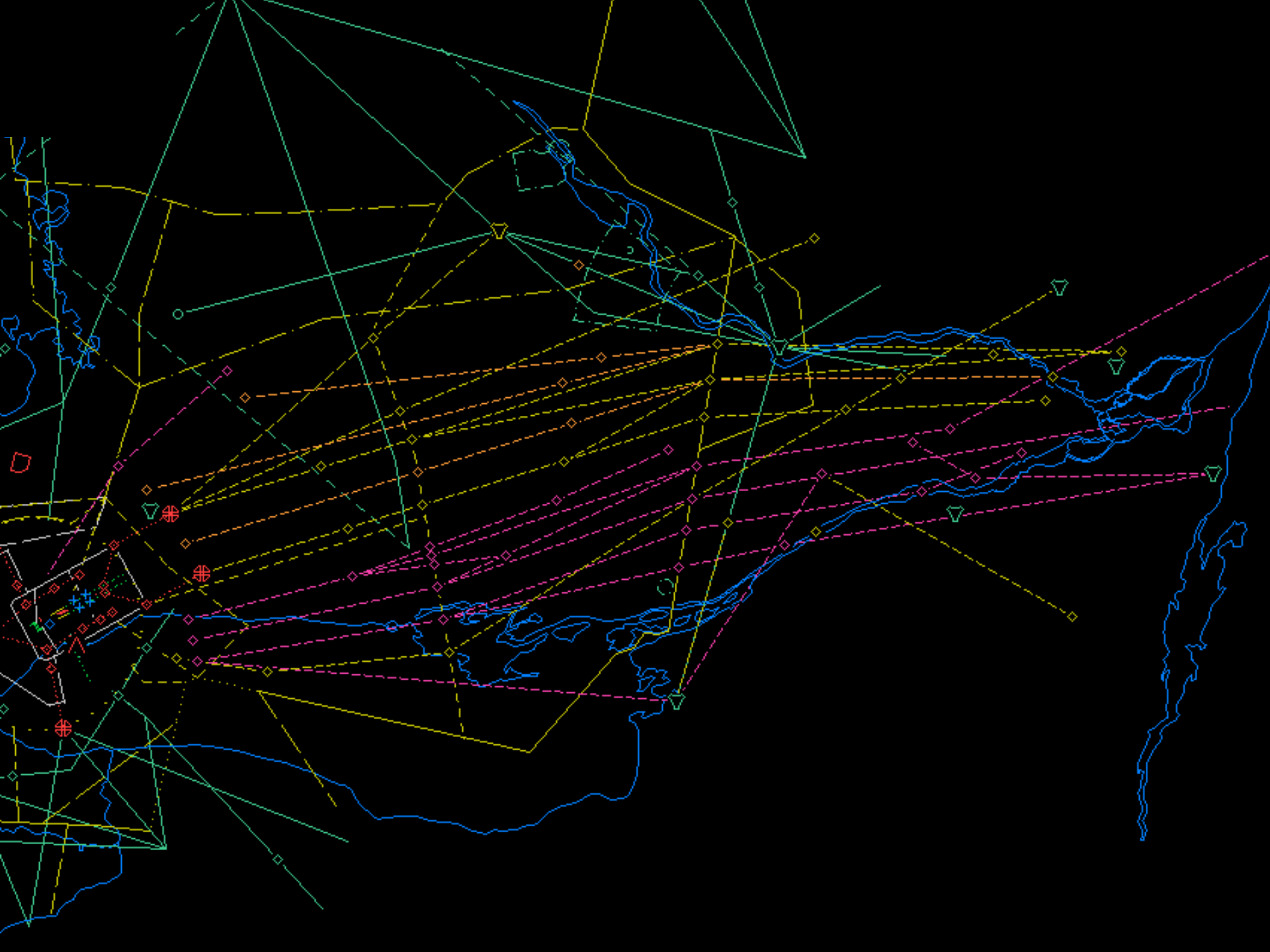
Busiest Corridor in Canada
Air Traffic Management Strategy
developed in 1989



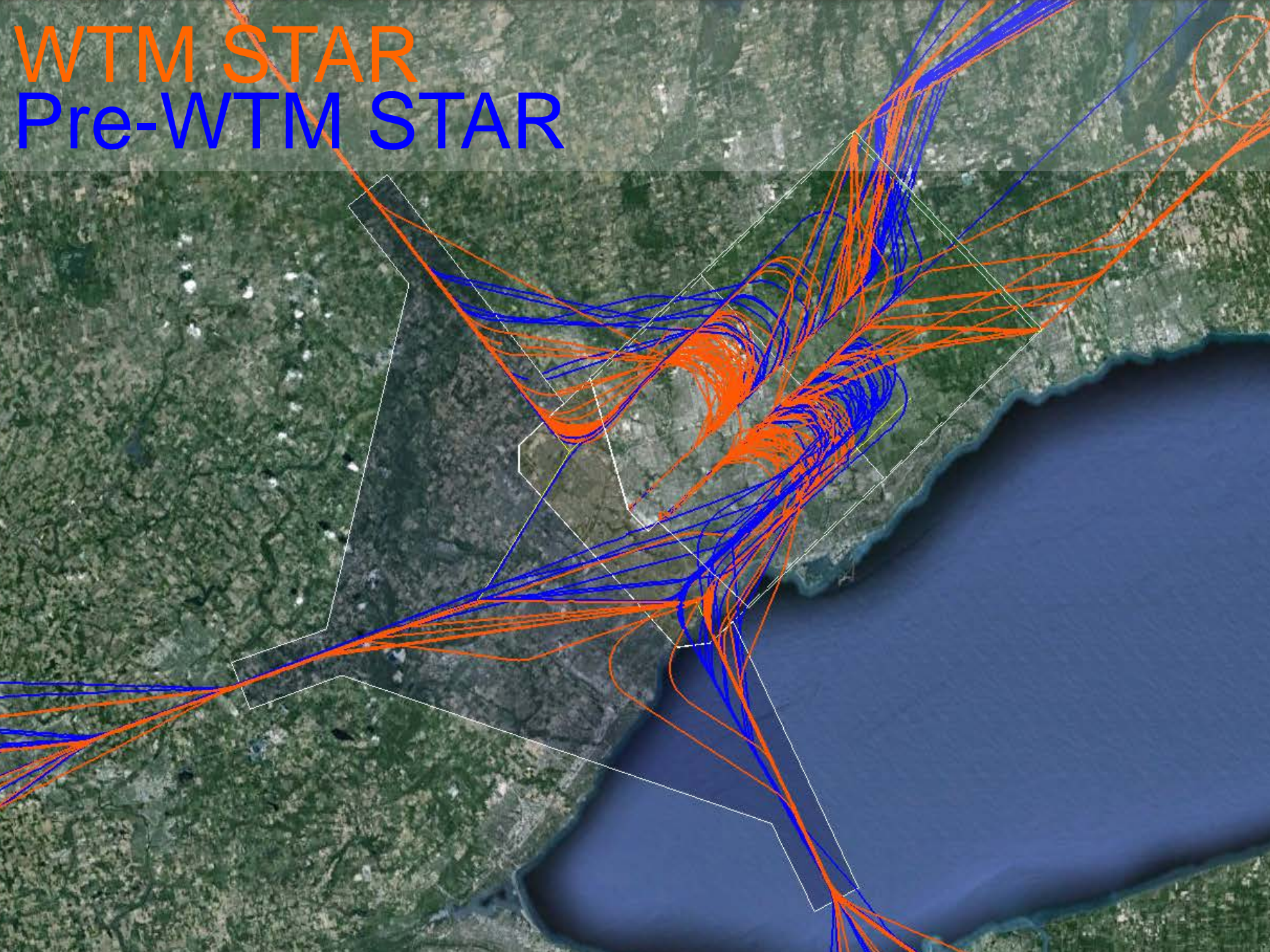




ER 6 ABV ES 5 BLO



WTM STAR
Pre-WTM STAR



Business Case Analysis

- ROI on behalf of our customers
- Supports customers' investment in equipment and the costs of operational approvals
- Timed investments by all parties
- WTM – Landing Westbound
 - Runway 24 Utilization – 54% ~ 181 days of use
 - Annualized = $181 \times 25,915 \text{ kg} = 4,690,615 \text{ kg}$
 - Annualized = $181 \times 19.63 \text{ hrs} = 3,553.03 \text{ hours}$
 - Avoided Fuel = **5,441,569** (Litres)
 - Avoided Fuel Cost = **\$ 4,353,255** (\$0.80/litre CAD)
 - Avoided GHG Emissions = **14,307** (Metric Tons of CO₂e)



Simulation

- Fast-time and real-time simulation
- Customers' aircraft simulators
- Desktop Flight Management System models

Simulation versus real-life

Canada Air Pilot

Effective 0901Z 9 FEB 2012 to 0901Z 5 APR 2012

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STAR (RNAV) RWYS 05, 06L, 06R

TORONTO/LESTER B. PEARSON INTL

IMEBA ONE ARR (IMEBA,IMEBA1)

TORONTO ON

ATIS	120.825
ARR	132.8 124.475 125.4
TWR	118.35 118.7

WHEN A LOWER ALTITUDE IS ISSUED, PILOTS SHALL DESCEND ON THE STAR PROFILE TO THE ATC ASSIGNED ALTITUDE, CHARTED RESTRICTIONS ABOVE THE ASSIGNED ALTITUDE REMAIN MANDATORY.

TURBOJET/FAN AIRCRAFT ONLY

*** → EXPECT RADAR VECTORS TO FINAL APPROACH

KILLALOE TRANSITION (YX1,IMEBA1)
POLTY TRANSITION (POLTY,IMEBA1)
LETAK TRANSITION (LETAK,IMEBA1)
TUKIR TRANSITION (TUKIR,IMEBA1)

* HOLDING @ IMEBA
FL230 or below
220 kt or less.

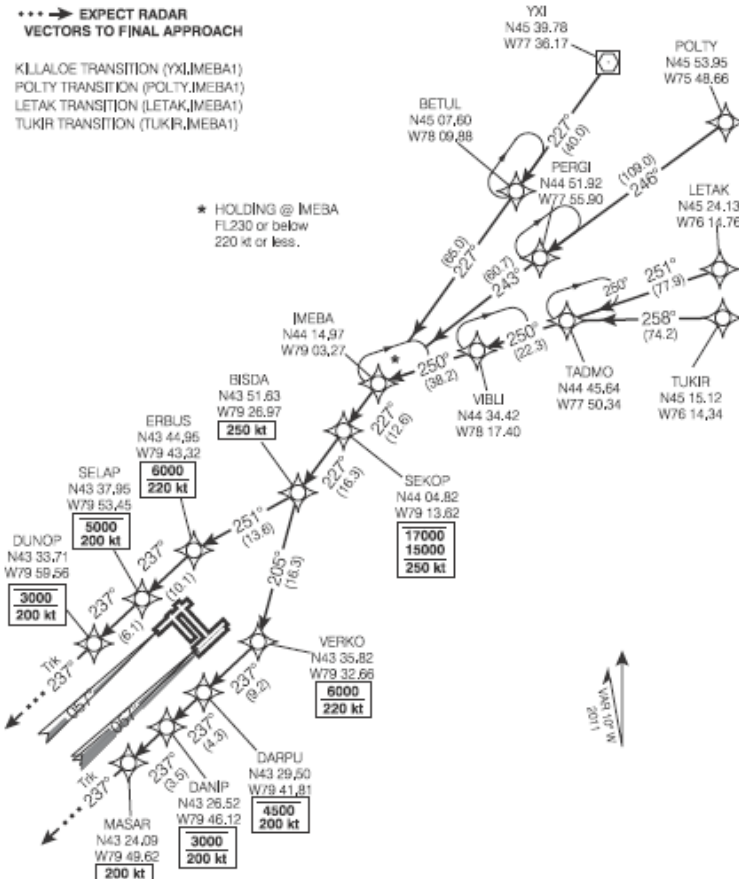


Chart not to scale

IMEBA ONE ARR (IMEBA,IMEBA1)

TORONTO ON

TORONTO/LESTER B. PEARSON INTL

EFF 9 FEB 12 CHANGE: New procedure

NAD83

Canada Air Pilot

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STAR (RNAV) RWYS 05, 06L, 06R, 23, 24L, 24R

TORONTO/LESTER B. PEARSON INTL

MANS FIVE ARR (YMS,YMS5)

TORONTO ON

ATIS	120.825
ARR	132.8 124.475 125.4
TWR	118.35 118.7

WHEN A LOWER ALTITUDE IS ISSUED, PILOTS SHALL DESCEND ON THE STAR PROFILE TO THE ATC ASSIGNED ALTITUDE, CHARTED RESTRICTIONS ABOVE THE ASSIGNED ALTITUDE REMAIN MANDATORY.

CYR 501
SFC TO 12,000 CONT
ABOVE 12,000 TO 15,000
OCSL BY NOTAM

BORDN TRANSITION (BORDN,YMS5)

TURBOJET/FAN AIRCRAFT ONLY

* HOLDING @ BORDN
265 kt or less and
20 NM legs

*** → EXPECT RADAR VECTORS TO FINAL APPROACH

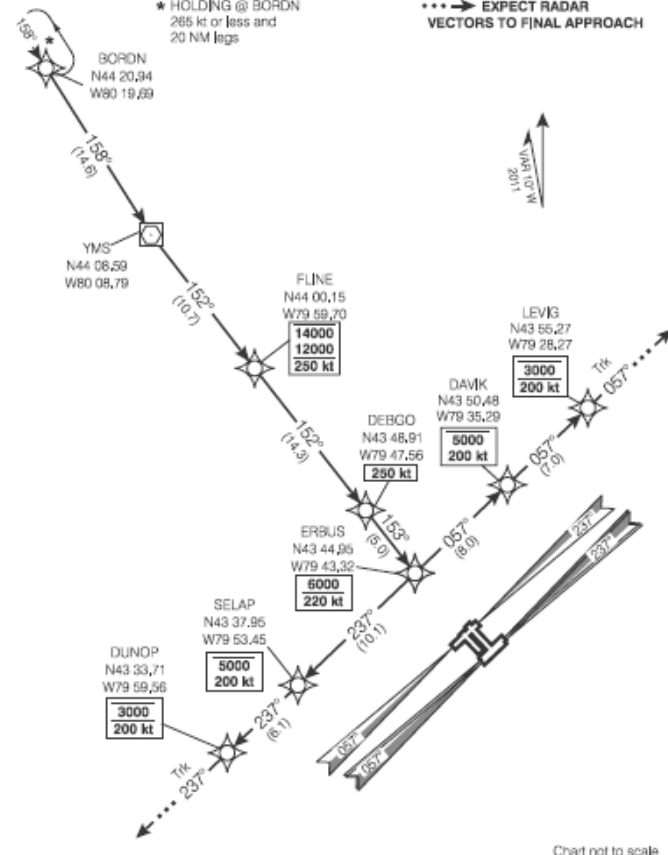


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MANS FIVE ARR (YMS,YMS5)

TORONTO ON

TORONTO/LESTER B. PEARSON INTL

EFF 9 FEB 12 CHANGE: Revised

NAD83

Customer Consultation

Project specific

- WTM – Windsor/Toronto/Montreal Airspace Redesign – Phase 2 started
- AASP – Alberta Airspace and Services Project - ongoing
- START – Montreal STAR redesign

Regional

- FIR AOCMs - Twice a year hosted in each FIR - Vancouver, Edmonton, Winnipeg, Toronto, Montreal, Moncton, Gander

National

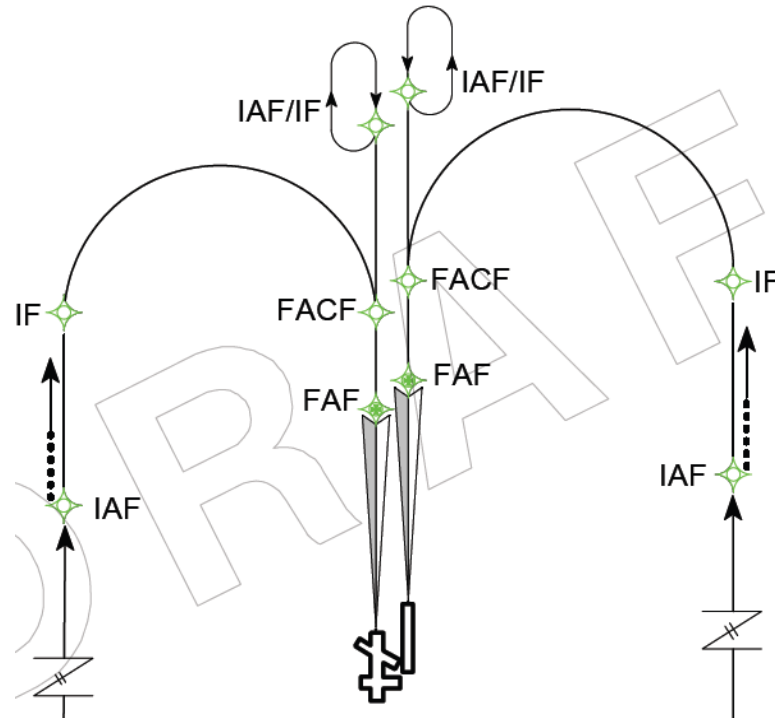
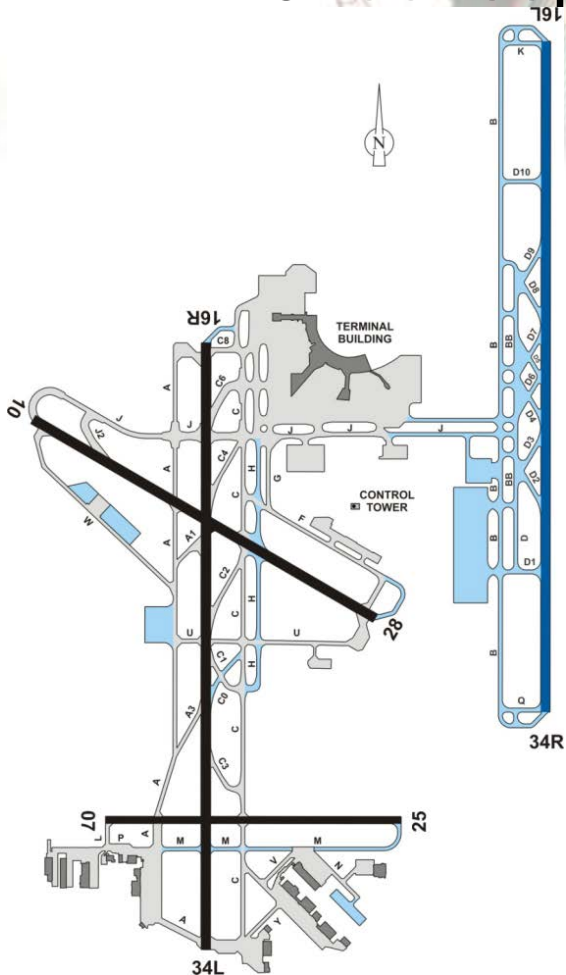
- NAV CANADA Performance-Based Navigation Working Group - Monthly webinar/telecon
- ATOCC – Air Transport Operations Consultation Committee – Twice yearly
- Civil Aviation Regulatory Advisory Committee PBN Working Group – Quarterly meetings



PBN in the near term

Alberta Airspace & Services Project

- New 14,000 foot parallel runway in May 2014
- 7120 foot separation, 5000-6000 foot stagger



Other PBN initiatives

- Montreal START Project
 - Redsigned STARs, include infrastructure for RNP RF transitions to final (Jan 2013)
- Winnipeg SID/STAR Redesign
 - RNAV basis, CDO/CCO, RF
- National BCA for implementation of RF path terminators



Items for further discussion

- Business case analysis
- Collaborative development
- Total System Approach

Thank you for your attention

Jeff Cochrane

NAV CANADA

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The logo for NAV CANADA is centered on a dark blue background. It features the words "NAV CANADA" in a white, bold, sans-serif font. The text is enclosed within a white, stylized oval shape that has a slight upward curve at the bottom, resembling a swoosh or a stylized 'C'.

NAV CANADA