Northern Air Transportation Association (NATA) Annual General Meeting Yellowknife, NWT

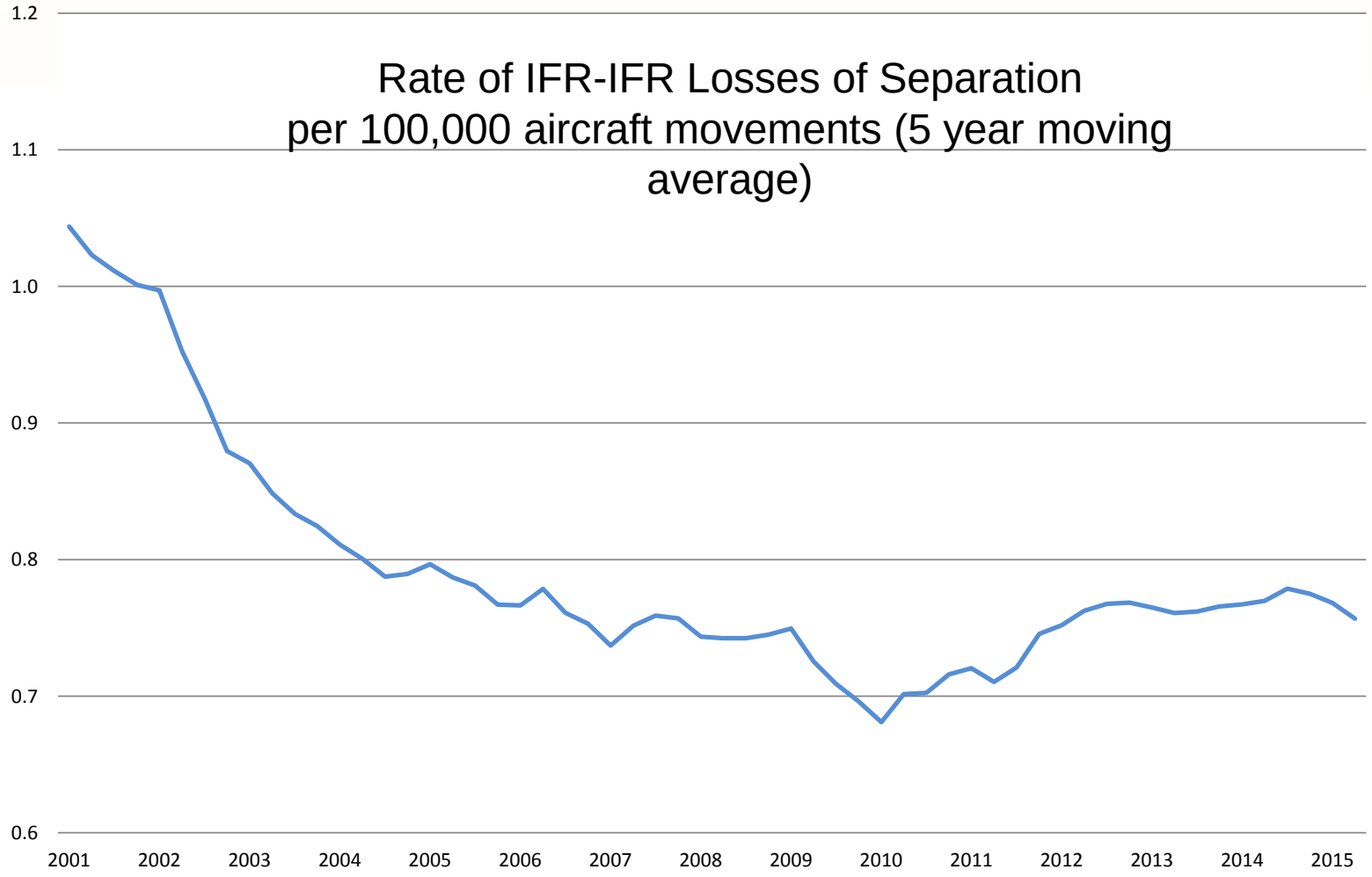
April 29, 2015

Outline

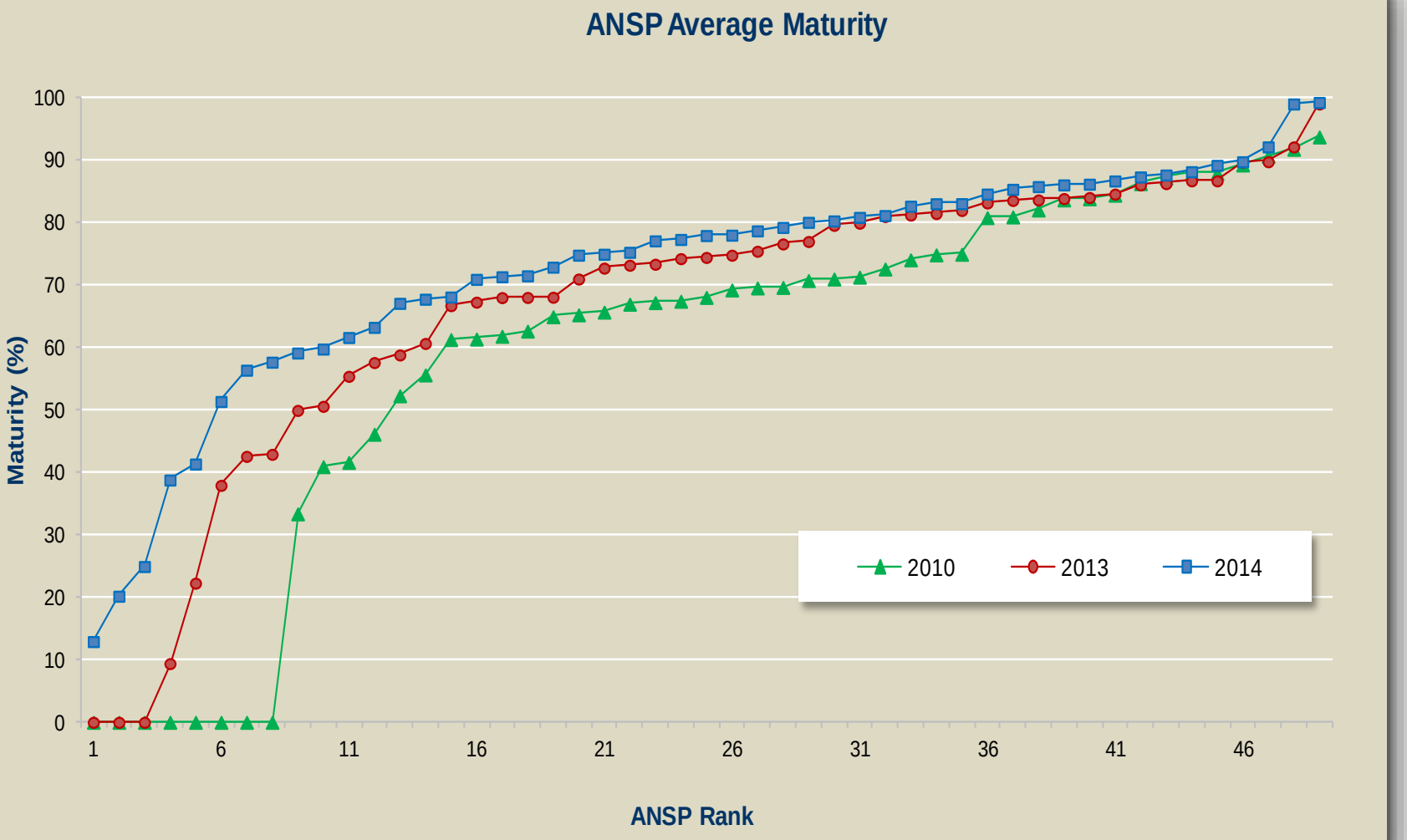
- Safety
- Traffic
- Revenues
- Customer Service

IFR/IFR Losses of Separation Rate per 100K Movements

NAV CANADA 2001-2015 (Q2)

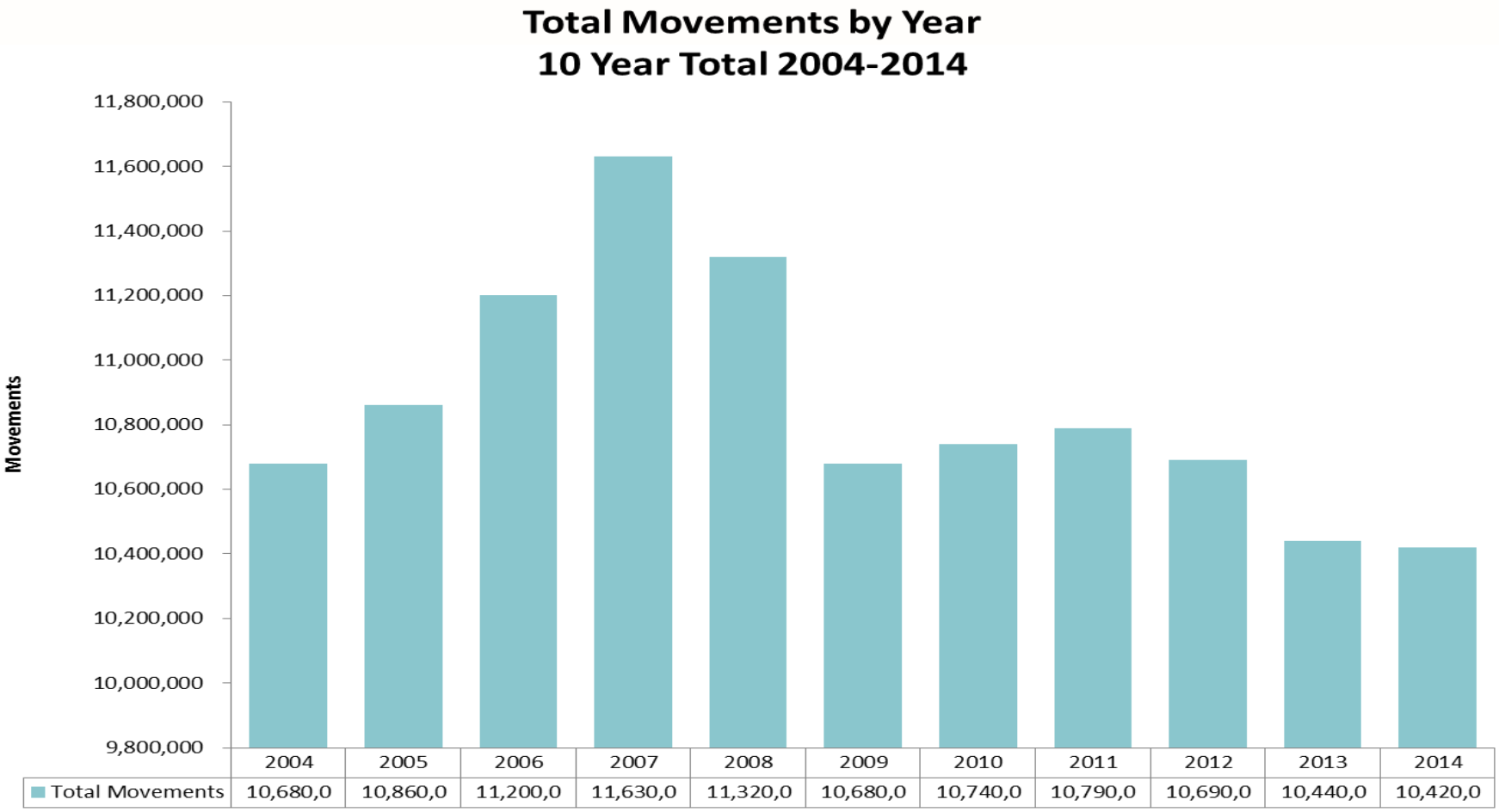


Safety – SMS Maturity



Movements per Year

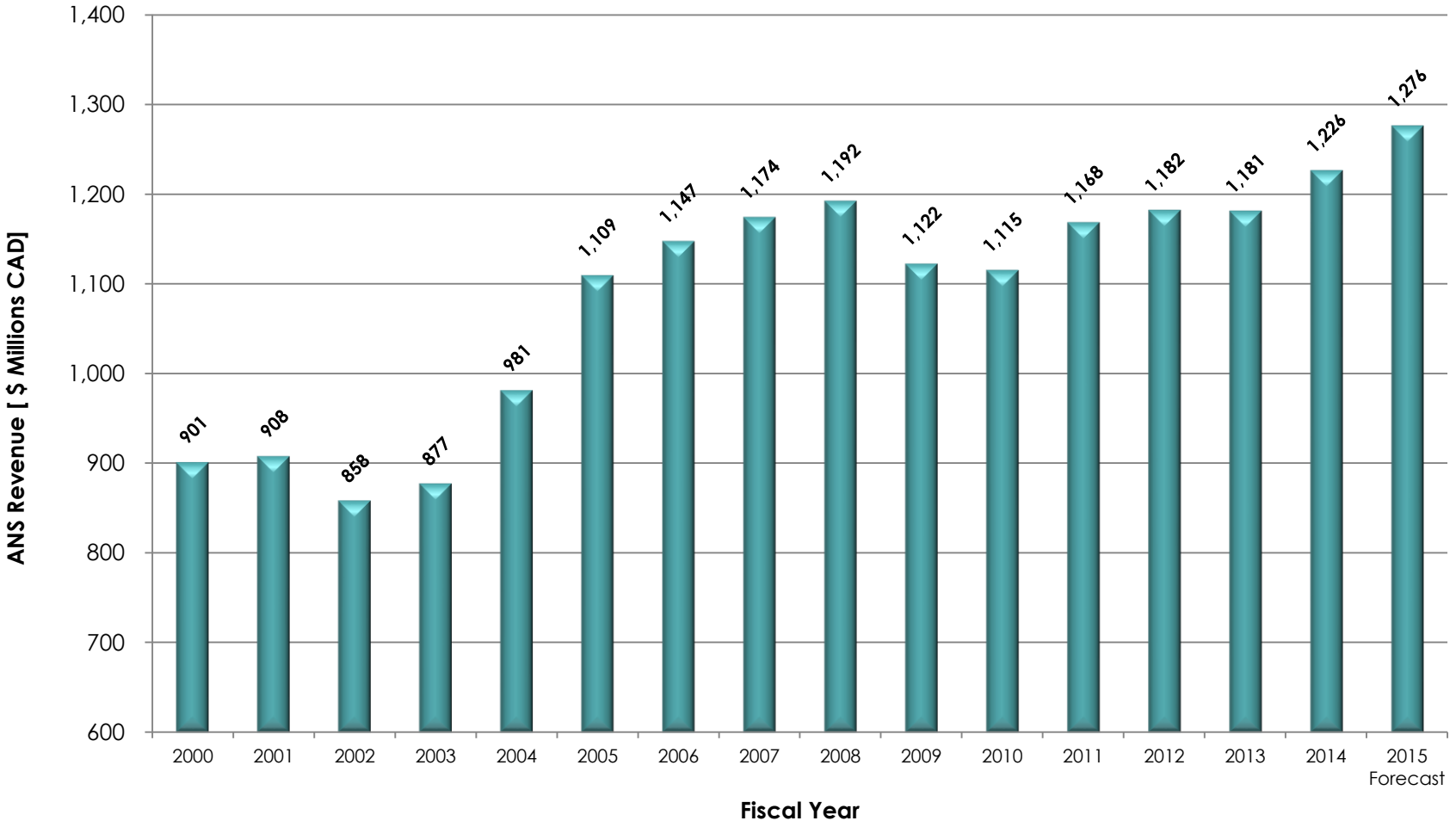
NAV CANADA 2004-2014



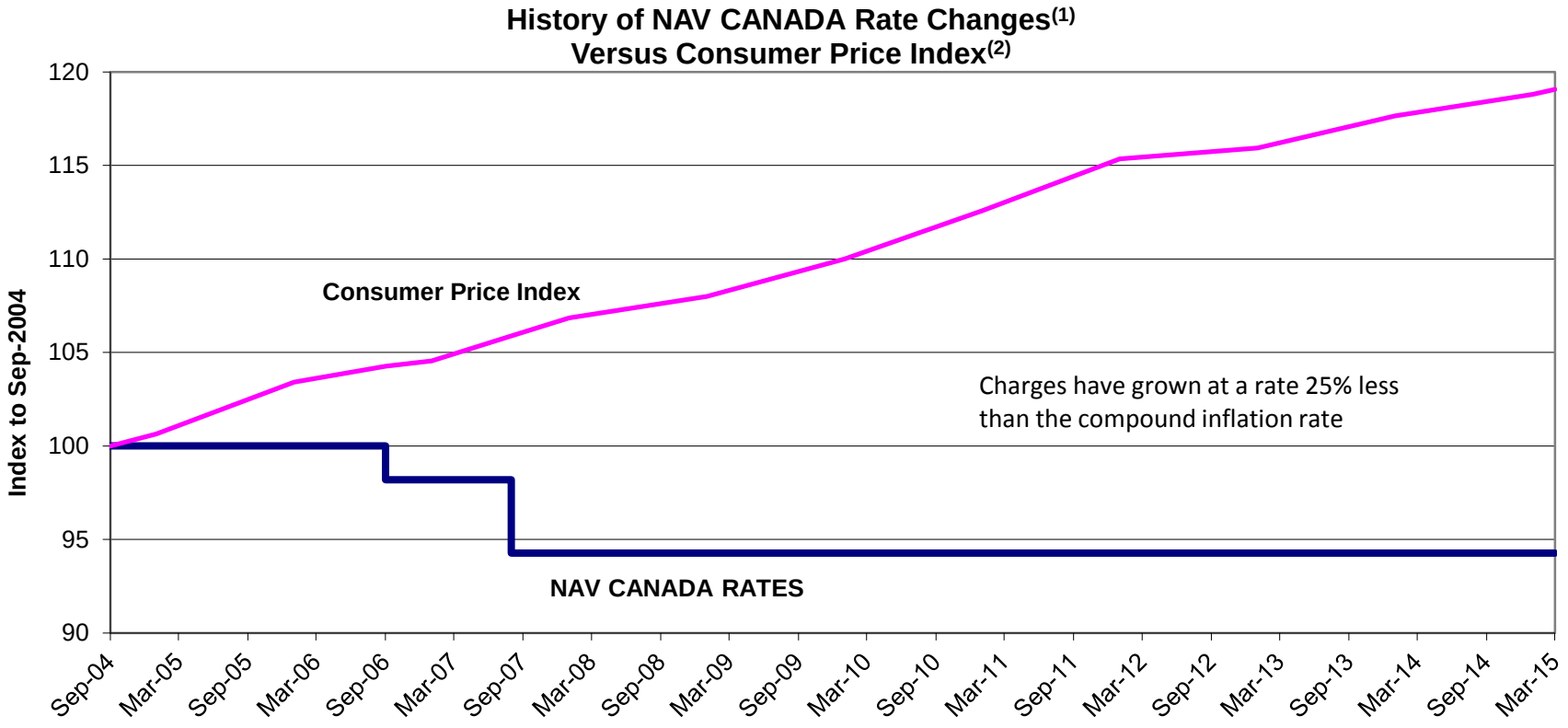
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total Movements	10,680,0	10,860,0	11,200,0	11,630,0	11,320,0	10,680,0	10,740,0	10,790,0	10,690,0	10,440,0	10,420,0

ANS Revenue

NAV CANADA FISCAL YEARS 2000-2015



NAV CANADA Rates vs CPI



1. Average changes since Sep-2004

Alternate Revenue Sources

- NAV CANADA is a large company with diverse assets both tangible and intellectual
- Our strategy is to lever off these assets to produce value
- Each dollar earned is a dollar less our core customers have to pay.

Alternate Revenue Sources

We have gone from 0 to over $50 million per year

- Technology Sales – Searidge
- CATSA maintenance
- NAV CENTRE
- Training
- Space Based ADS-B

NAV CANADA


NASA
HD

Customer Focus

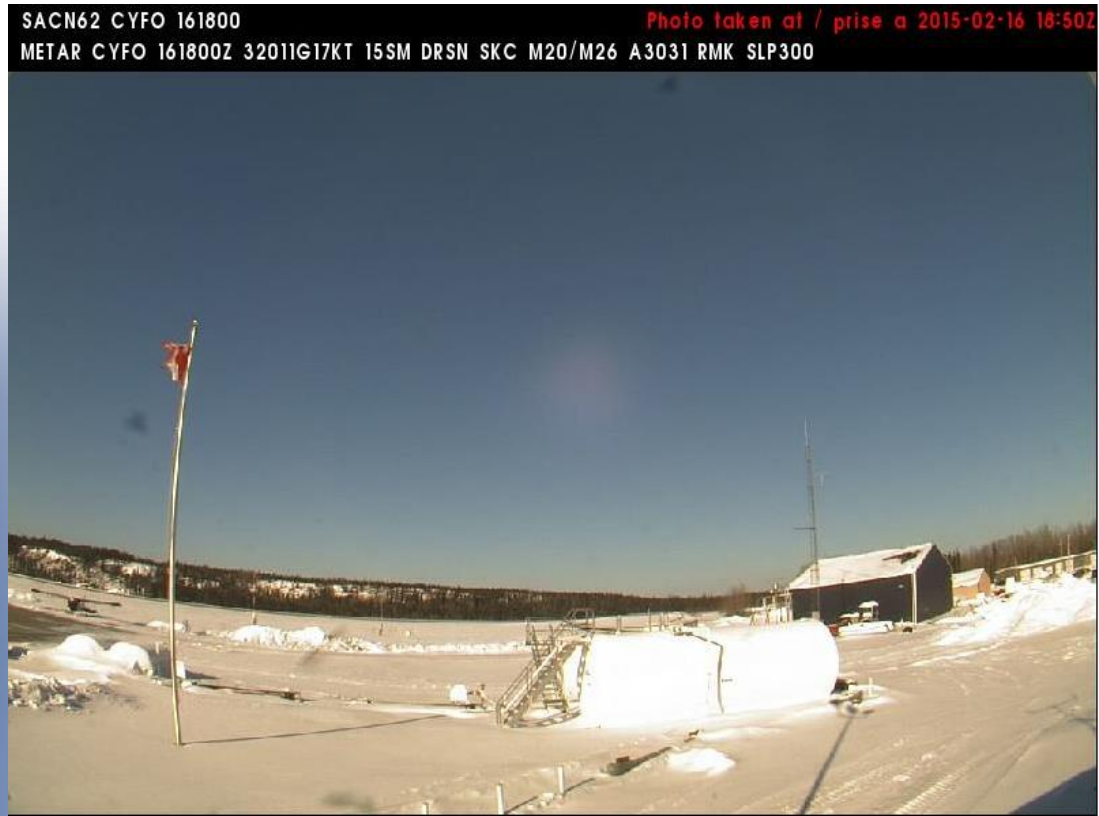
- Performance Based Navigation
- Ground Based NAV AIDS
- Enhanced ATM Technology Development
- AIM Transition
- Flight Information/Weather
- Equipment reliability performance

Weather Advancements

Core weather data

- AWOS
- HWOS
- LWIS

additional cameras



Northern Air Transportation Association (NATA) Edmonton FIR update

April 29, 2015

SERVING A WORLD IN MOTION

Outline

- Collaborative discussion and communication process
- Technology Initiatives
- Design and Maintenance of Instrument Procedures LOS Policy
- NAVAIDS Modernization
- Level of Service – Aeronautical Studies
- Summary

2014/15 Highlights

- Human Weather Observations System (HWOS) / Limited Weather Information Services (LWIS) project complete
- Weather Camera Phase 2
- Automated Weather Observation Systems
- ILS replacement
- Completed Alberta Airspace and Services Project – new runway at CYYC

Collaborative discussions

- Local
  - Pilot forums, COPA rust removers, Local Airport Authority
- Industry
  - Northern Air Transportation Association (NATA)
  - Air Transportation Association of Canada (ATAC)
  - Other – CBAA, COPA, NAAC, CAC, etc.
- Regional
  - Area Operations Consultative Meetings (AOCM)
- National
  - Air Transportation Operational Consultation Committee (ATOCC)
  - Air Navigation Services National Advisory Group (ANSNAC)

HWOS-LWIS Installation

Commissioned

Dawson, Old Crow, Repulse Bay, Whale Cove, Faro, Mayo, Chesterfield Inlet, Gamèti, Aklavik, Ft. MacPherson, Whitecourt, Teslin, DélĮne, Ft. Liard, Tulita, Ft. Good Hope, Beaver Creek, Eureka, Ft. Resolution, Igloolik, Łutselk'e, Wrigley, Tuktoyaktuk, Paulatuk, Ulukhaktok, Grise Fiord, Kimmirut, Kugaaruk, Sachs Harbour, Masset, Nain, Makkovik, Sanikiluaq, Berens River, Meadow Lake, Buffalo Narrows

HWOS-LWIS Observations

Non-staffed hours: Automatic generation of LWIS observations

Staffed hours: Automatic generation of LWIS observations only when a human observation is **not** produced by HH+20 for the first hour and at HH+15 for each subsequent hour that a human observation is **not** produced.

- 0900Z LWIS observation (non-staffed hours)
- 1000Z LWIS observation (non-staffed hours)
- 1100Z human observation (staffed hours begin)
- 1107Z No human observation
- 1120Z LWIS observation for 1300Z (HH+20)
- 1200Z No human observation
- 1215Z LWIS observation for 1200Z (subsequent hour HH+15)
- 1300Z No human observation
- 1315Z LWIS observation for 1300Z (subsequent hour HH+15)
- 1400Z Human observation

Weather Cameras Phase II (cont.)

Planned installations – 2015

March: Norway House, Lac Brochet, Stony Rapids
June: Braeburn, Cape Dorset, Gods Lake Narrows
July: Rainbow Lake, Nahanni Butte, Ft. Liard, Faro, Burwash, Arctic Bay, Arviat, Hall Beach, Pond Inlet, Yorkton
August: Oxford House, Ft. Chipewyan*, Lloydminster*, Slave Lake*
November: Churchill Falls*

*additional cameras

*additional cameras

AWOS Installation

- New AWOS
  - Colville Lake – Nov 2014
  - Wabush– 14 Sept 2014
  - Mary's Harbour – 5 Mar 2015

AWOS Installation

- New AWOS – 3rd party sponsored
  - Attawapiskat, Armstrong, Ogoki Post and Peawanuck – Nov 2014

Design and Maintenance of

Instrument Procedures

LOS policy

Policy

Rationale

- Due to satellite based (GNSS) navigation, any aerodrome – with an altimeter source – can now have an IAP designed
  - May or may not benefit the system as a whole
  - GNSS has created huge demand/workload
- In addition to NAV CANADA, there are other companies in Canada that can design and maintain instrument procedures
- A rational approach/policy is required to manage demand

Eligibility Criteria

Civil aerodromes must meet one or more of the criteria to be considered by NAV CANADA for development and maintenance of instrument procedures:

- The aerodrome serves scheduled passenger and/or cargo air service;
- The aerodrome is regularly filed as an IFR alternate for scheduled passenger and/or cargo air service;
- Aerodrome IFR access is vital to the community owing to a lack of alternate means of access;
- The aerodrome has an aviation weather observation program sponsored by NAV CANADA;
- NAV CANADA has recommended supporting the aerodrome as a result of a level of service review, or because it is integral to the operation of a major terminal area.

External Design Organizations (EDOs)

- The operator of a civil aerodrome that does not meet the eligibility conditions may engage an EDO for the development, maintenance and submission of IP

- A sponsor or aerodrome operator seeking to engage an EDO for the development and maintenance of a procedure at a civil aerodrome that meets NAV CANADA's eligibility criteria must notify NAV CANADA prior to the development of the procedure to ensure effective coordination of aeronautical data amendments

Submission Sponsor

Any request for design of an IP must be submitted by aerodrome operator, or by a sponsor (organization, air carrier, etc). When submitted by a sponsor, the sponsor must demonstrate that the aerodrome operator is committed to providing and maintaining the aerodrome aeronautical and facilities data necessary to support the design and operational use of the procedure.

Ground-based NAVAIDS Modernization

Current NAVAID situation

- >300 NAV CANADA NDBs
- 120 VORs
- Reduced dependence on ground-based NAVAIDs
- Life-cycle management issues
- Ad hoc demands for real estate

Current navigation environment

- Advances in space-based navigation present opportunities to maintain or enhance safety while improving efficiency
- Recognise both the robust nature of space-based navigation and inherent limitations
- Maintaining a ground-based network that has little relevance to current operations

Responsible modernization …

- Enable operations under existing CARs for IFR flight (safety)

- Meet the operational needs of our customers (safety and efficiency)

Initial change considerations

- Provide a robust NAVAIDS network
- Maintain accessibility to northern airports
- Determine efficient operational NAVAIDS requirements

Anything else?

IFR Lowest common denominator?

- Aircraft without an “autonomous” means of navigation in the event of an unforecasted system infrastructure failure
- Aircraft outside of surveillance coverage that cannot be assisted by ATC
- Aircraft operating at low altitudes and therefore “line-of-sight” challenged for ground-based navigation or surveillance

Anything else?

Initial assumptions

- Normal en route operations are area navigation based relying primarily on GNSS
- Approach operations are a combination of RNAV/RNP and ground-based
- No CARs changes proposed
- Retain all existing ILSs
- ILS not to include a requirement for NDB

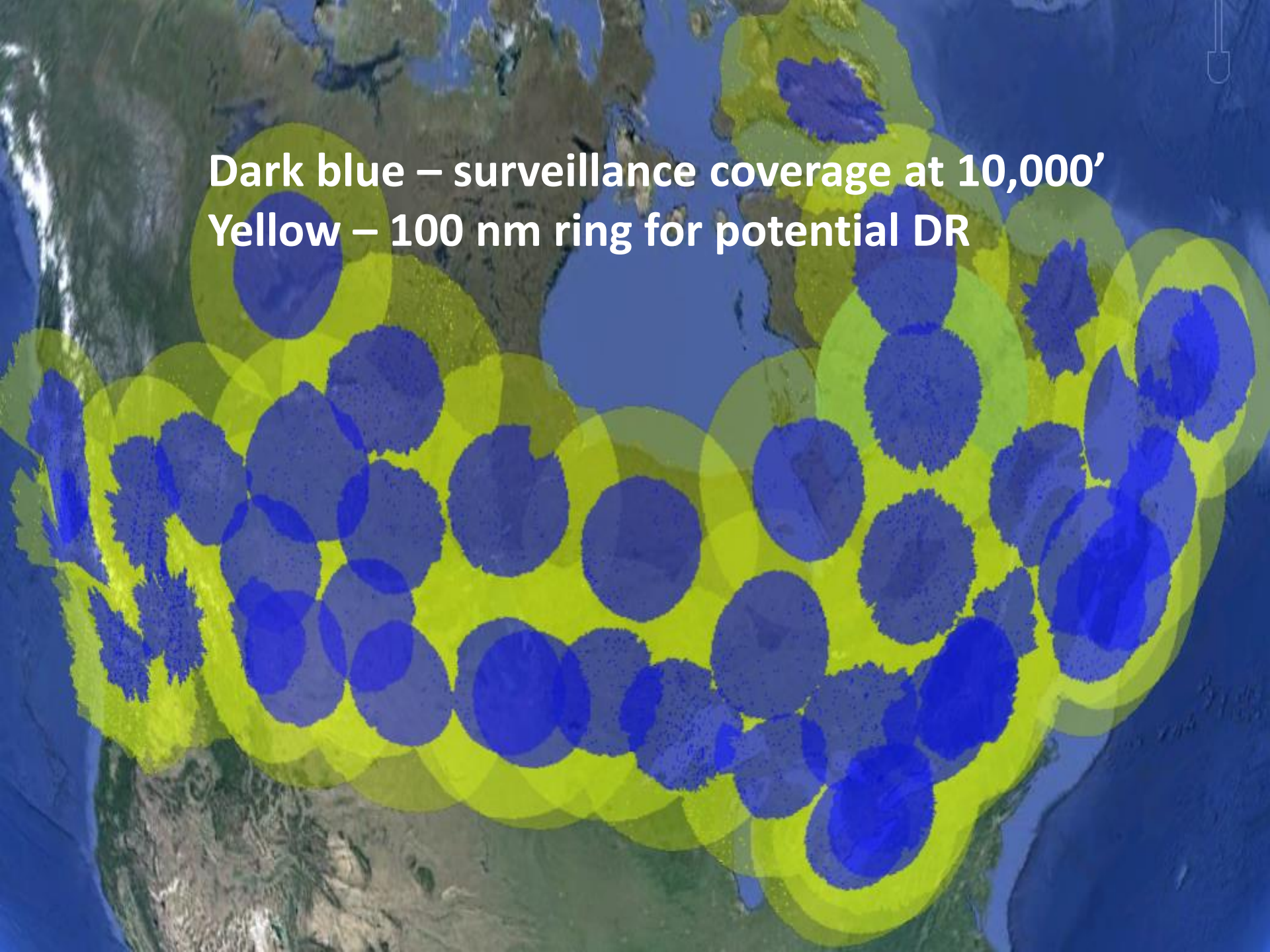
Anything else?

Initial assumptions – fail operational

GNSS en route but protect against unlikely loss of signal

- NDBs and VORs assessed for removal where within radar coverage at 10,000’ and not required as a landing aid (vectors available)
- Majority of designated mountainous region NAVAIDs remain (line-of-sight limitations)
- Majority of northern NAVAIDs remain (remote or sparsely settled areas)
- En route dead reckoning acceptable for short durations (~100 nm)

Anything else?


Dark blue – surveillance coverage at 10,000’
Yellow – 100 nm ring for potential DR

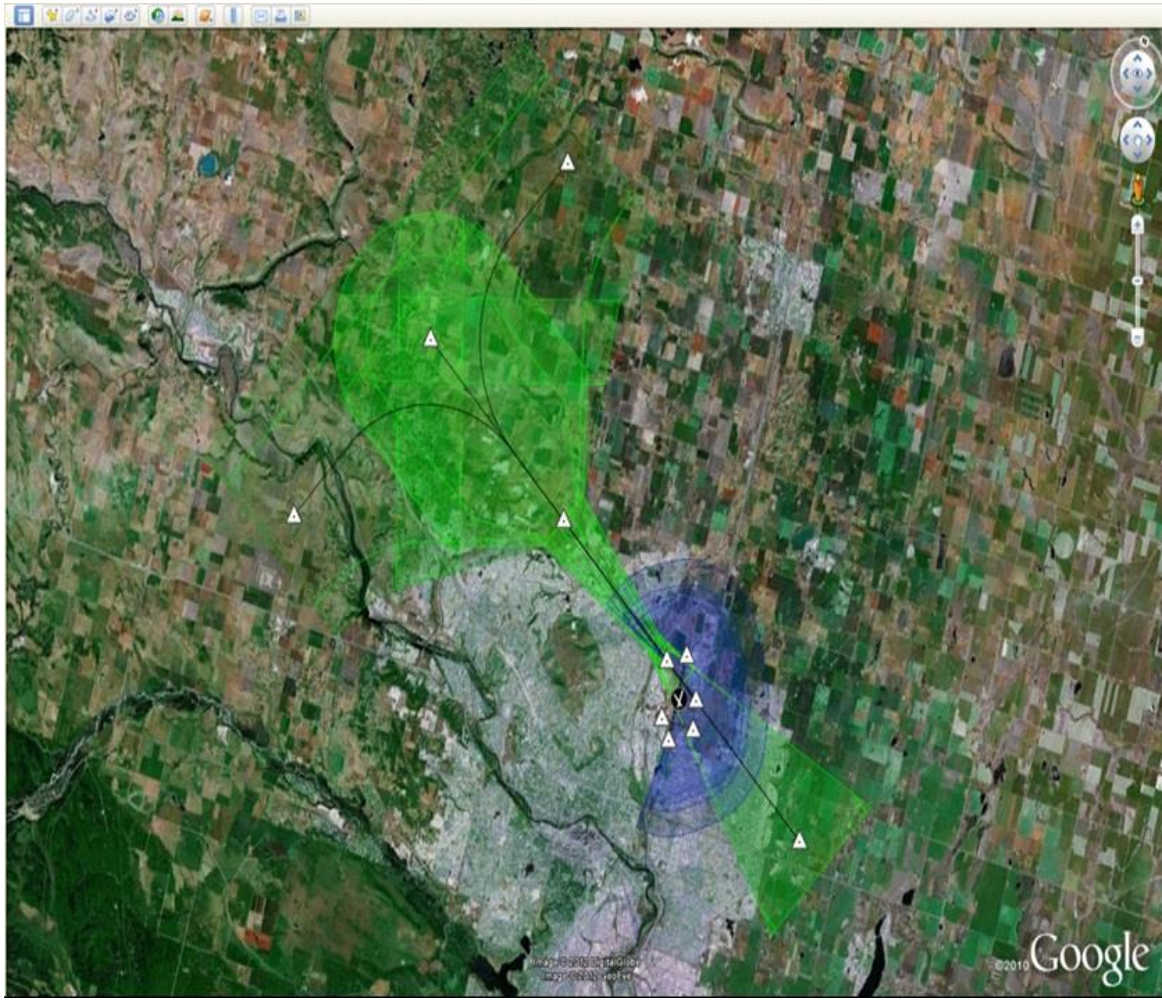
Summary

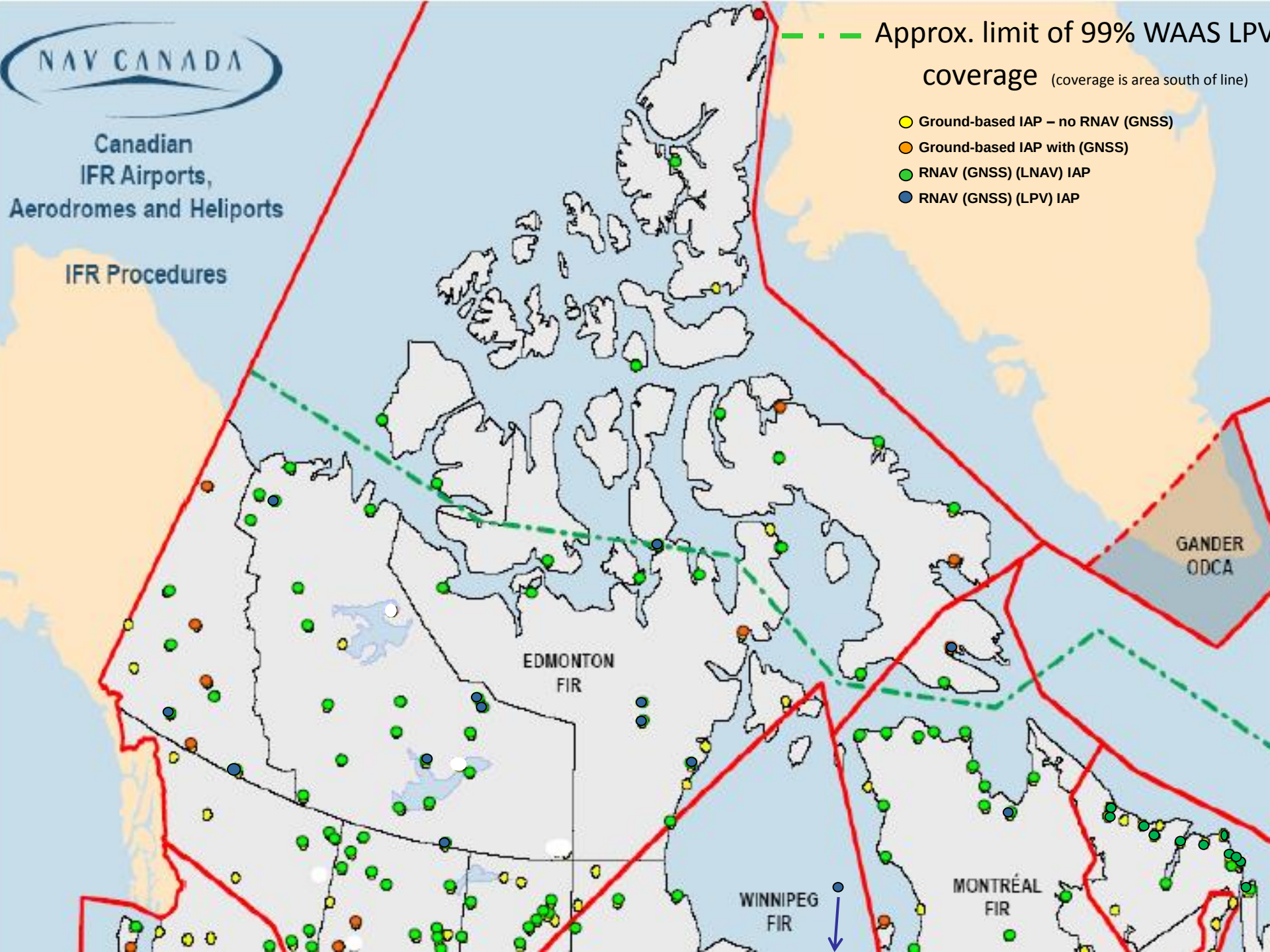
- GNSS is the primary en route aid
- Mixture of space-based and ground-based approach aids meeting current CARs
- Recovery plan protecting against highly unlikely catastrophic GNSS failure
- Maintain a navigation network that reflects the operational safety and efficiency needs of all of our customers
- Next step
  - Proposal to actively conduct consultation and listening sessions

Lower density Airports (All Regions)

- 2 GNSS – LNAV plus one with vertical guidance (LNAV/VNAV, LPV or RNP)

- 1 Conventional – best access




NAV CANADA
Canadian
IFR Airports,
Aerodromes and Heliports
IFR Procedures
Approx. limit of 99% WAAS LPV coverage (coverage is area south of line)
Ground-based IAP – no RNAV (GNSS)
Ground-based IAP with (GNSS)
RNAV (GNSS) (LNAV) IAP
RNAV (GNSS) (LPV) IAP
EDMONTON FIR
GANDER OCA
WINNIPEG FIR
MONTRÉAL FIR

ILS Replacement

New ILS installations (no back-course guidance)
RNAV (GNSS) approach developed to replace back-course

Completed 2014

Resolute Bay

Saskatoon, SK

Scheduled 2015

Terrace: rwy 33 – Sept (Maybe sooner)

St. John's: rwy – Oct

Toronto: 06R, 24L – June

Vancouver: 26L & CAT III upgrade – Aug

Aeronautical Studies

Implemented

- **Colville Lake, NT – Weather Requirements**
  - Install AWOS
- **Central and Southern Alberta Airspace**
  - Modify airspace in vicinity of Edmonton
  - Revoke LF & VHF airways; establish RNAV airways
- **Wabush, NL – FSS Hours**
  - Reduce hours of FSS and install AWOS
- **Mary's Harbour, NL – Weather Requirements**
  - Close CWO and install AWOS
- **Kitchener/Waterloo, ON – VOR**
  - Decommission VOR
- **Poste Montagnais, QC – NDB**
  - Decommission NDB
- **Uranium City, SK – NDB**
  - Decommission NDB
- **Regina, SK – NDB**
  - Decommision Brophy (ZRG) NDB

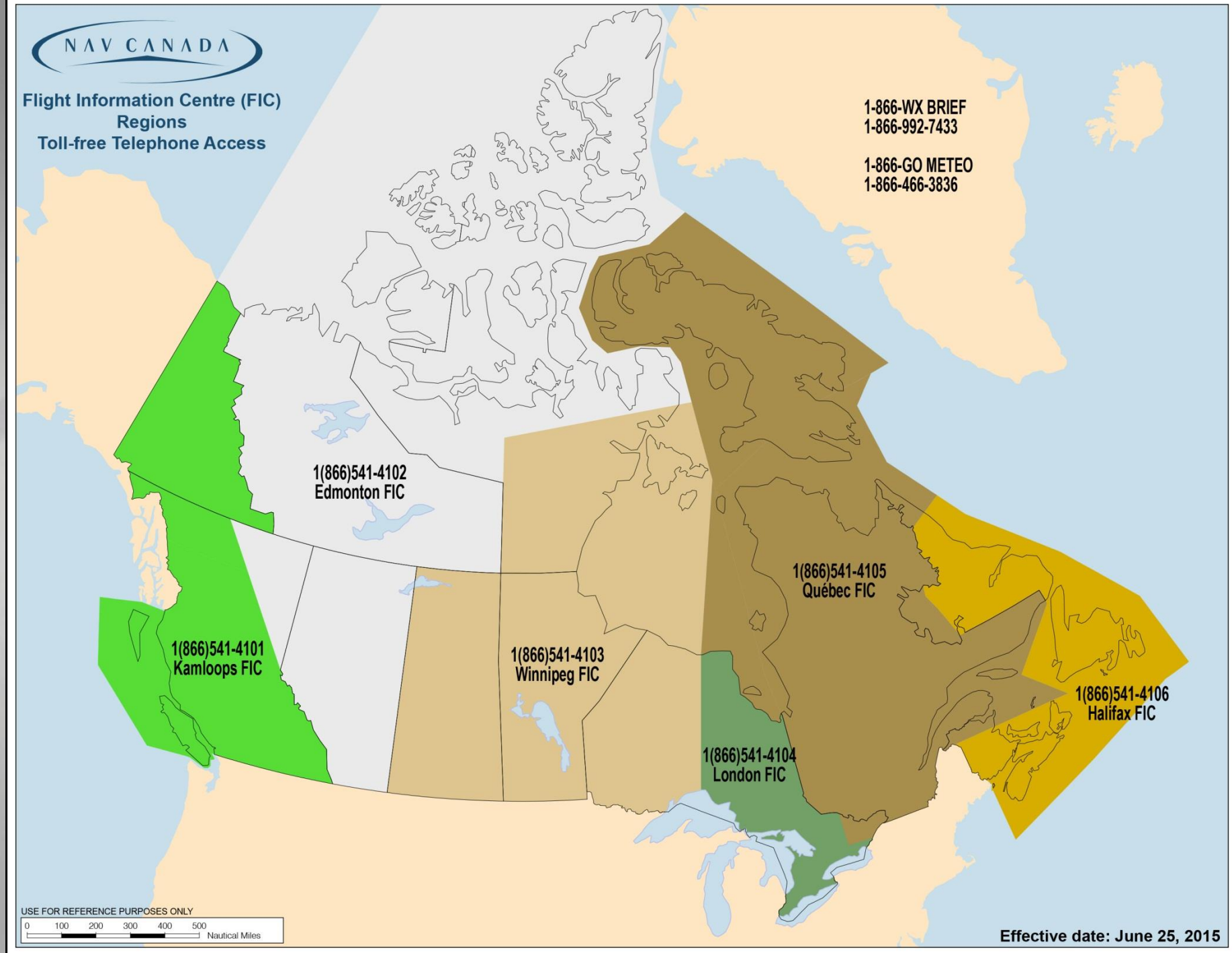
Aeronautical Studies (cont'd)

Awaiting Implementation

- **South Athabasca Oil Sands Area, AB – Airspace & ATF**
  - Establish area ATF
  - Change airspace classification (Class "E")
- **Uranium Mines Area, SK – ATF**
  - Establish area ATF
- **Medicine Hat, AB – VOR**
  - Decommission VOR

Northern FIC Services

- Effective June 25, 2015
- Pilot Briefing and Flight Planning Services transferred from North Bay FIC to Edmonton, Winnipeg and Quebec FICs
- No change in level of service
- All of the flight information services currently available to pilots operating throughout the area are maintained
- Only change being the location from which certain pre-flight services will be provided
- Arctic Radio continues to provide communication services via RCOs

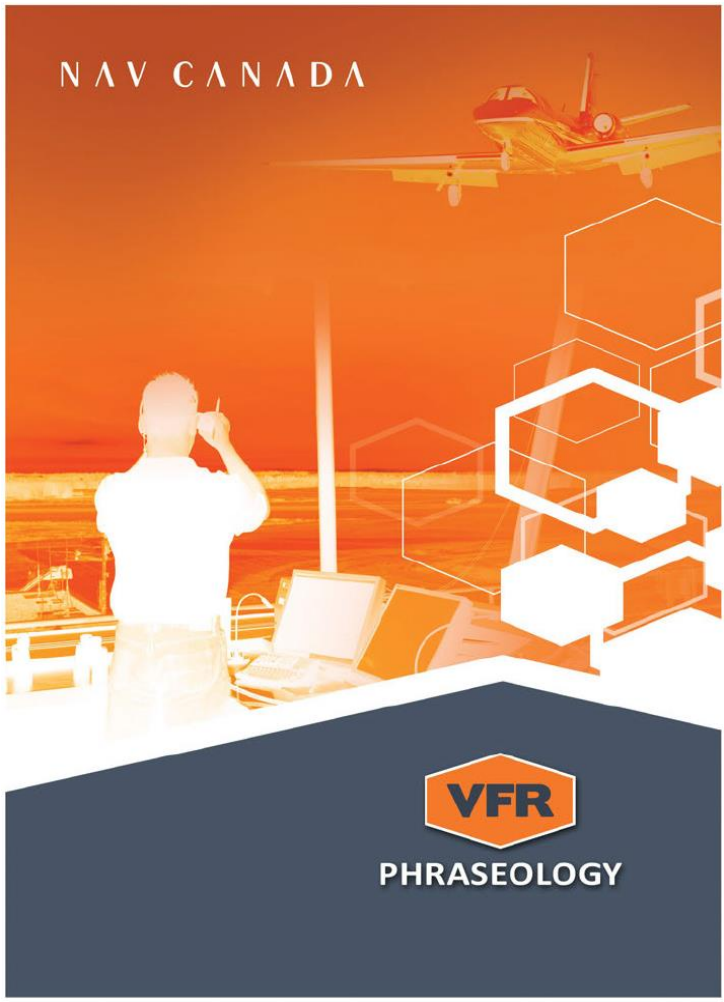

NAV CANADA
Flight Information Centre (FIC)
Regions
Toll-free Telephone Access
1-866-WX BRIEF
1-866-992-7433
1-866-GO METEO
1-866-466-3836
1(866)541-4102
Edmonton FIC
1(866)541-4101
Kamloops FIC
1(866)541-4103
Winnipeg FIC
1(866)541-4105
Québec FIC
1(866)541-4104
London FIC
1(866)541-4106
Halifax FIC
USE FOR REFERENCE PURPOSES ONLY
0 100 200 300 400 500
Nautical Miles
Effective date: June 25, 2015

VFR Phraseology Guide

VFR Phraseology Guide

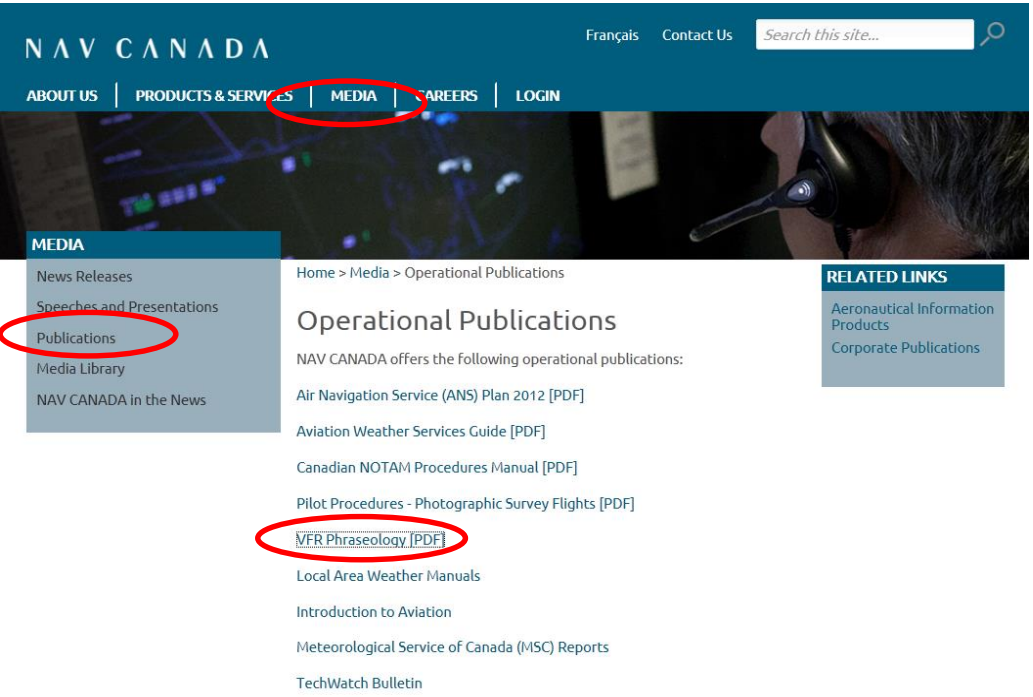
NAV CANADA has released a VFR Phraseology Guide for pilots travelling in Canadian airspace.

http://www.navcanada.ca/EN/media/Publications/VFR%20Phraseology.pdf



NAV CANADA

VFR Phraseology Guide (cont)



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Jazz
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CARIBOO AIR
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Summary

- Focus on improving safety, performance, service efficiency and cost-effectiveness in Northern and Remote areas
- Improvements in service planned
  - RNAV (GNSS) procedures
  - Equipment (EXCDS) Upgrades at Towers and FSS
  - New Technology applications (HWOS/LWIS, AWOS)
- Constant evaluation of all services for efficiency gains
- Continued Customer / Stakeholder collaboration

Questions?

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Thank you