The NAV CANADA Air Navigation System Plan

Jeff Dawson
Director, Operational Support
NAM/CAR ANI/WG/1 – 22 to 26 July 2013
Outline

• About NAV CANADA
• Charting the Future: our Air Navigation System Plan
• Initiatives
• Mapping to ASBU Modules
• Looking ahead
ABOUT
NAV CANADA
About NAV CANADA

- Private, non-share capital company
- 2nd largest ANSP in the world
- 12 million aircraft movements annually
- 18 million square km of airspace
- Regulated by Federal Government on Safety Performance
Our People

- 4,750 employees across the country
  - Air Traffic Controllers
  - Flight Service Specialists
  - Electronics Technologists
  - Engineering and IM
  - Corporate Functions
Our Services

• Air Traffic Control
• Flight Information
• Weather Briefings
• Aeronautical Information
• Airport Advisory Services
• Electronic Navigation Aids
Charting the Future
the Air Navigation System Plan
• NAV CANADA’s projected plans for development
• Initiatives aimed at meeting customers’ requirements
• Mapped to ICAO ASBUs
• Short term (2012-2014) & near term (2015-2019) plans
• Generates further stakeholder discussions
Air Navigation System Plan Initiatives
Performance Based Navigation (PBN)

- Short term (2012-2014)
  - PBN approaches in Toronto, Montréal, Ottawa & Quebec City
  - Radius to fix trials in Toronto, Calgary & Vancouver
  - Terminal airspace redesigns
  - Decommission some non-essential ground-based NAVAIDS
  - RNP 10 in northern part of Edmonton FIR
  - Begin transition from CMNPS and RNPC to PBN
Performance Based Navigation (PBN)

  - Continued terminal airspace redesigns
  - Re-define low-level airspace structure
  - Continued decommissioning of non-essential ground-based NAVAIDS
  - Transition from CMNPS & RNPC to PBN
  - Continued implementation of RNAV/RNP procedures
  - Basis for future transition to 4D trajectory based operations
Communications

• Short term (2012-2014)
  – Remote communications outlet redesign to reduce UHF
  – Domestic enroute CPDLC
  – VHF radio replacement program
  – SATCOM voice
  – Pre-departure data link clearance at major airports
  – AIDC
  – Domestic enroute ADS-C
Communications

  - Complete VHF radio replacement program
  - New telecom infrastructure
  - HF voice retained as backup for VHF & data link
  - AHMS implemented and AFTN decommissioned
Surveillance

- Short term (2012-2014)
  - Assess PSR requirements
  - Expand WAM & MLAT
    - WAM at Kelowna
    - MLAT at Calgary & Toronto
  - Video surveillance
  - Fusion tracking technology
  - Expand ADS-B
Surveillance

• Near term (2015-2019)
  – Radar replacements
  – Reduce or eliminate surveillance gaps
  – Expand WAM
  – ADSE replacements with ADS-B, MLAT and/or video
  – Assess radar and WAM for conversion to ADS-B
  – LEOS ADS-B
Air Traffic Management (ATM)

• Short term (2012-2014)
  – Full integration of web-based IFR flight planning
  – Web-based flight plan centric pilot briefings
  – Collaborative Flight Planning System mobile app
  – ICAO compliant data exchange interface for weather (WXXM)
  – FPL 2012
  – Improved air traffic controller decision support tools
  – Flight service station modernization project
  – Prepare for Phase 1 implementation of RLatSM
  – RLongSM in domestic airspace
Air Traffic Management (ATM)

  - ICAO compliant data exchange interface for flight data
  - Expanded RLatSM
  - Advanced decision support tools for air traffic flow management
  - Implementation of FF-ICE concepts
  - Continued integration of RPA into the air navigation system
  - Optimize separation & improve safety nets via data fusion
Aeronautical Information Management (AIM)

- Short term (2012-2014)
  - eAIP
  - SNOWTAM to replace NOTAMJ
  - Automated runway friction measurement reporting
  - Expanded electronic publication product line
  - Increased availability of data on portable electronic devices
Aeronautical Information Management (AIM)

• Near term (2015-2019)
  – Conversion to ICAO NOTAM format
  – Digital NOTAM
  – eTOD
  – Automation of land use assessment process
  – Continued evolution away from paper publications
Aviation Weather

• Short term (2012-2014)
  – Collaborative flight planning system geo-referenced data
  – Replacement of legacy weather observation input systems
  – Automated weather observation and limited weather observation systems to be implemented at 16 remote sites
  – Expansion of weather camera systems
  – Conversion of SIGMET and AIRMET to ICAO compliant formats
Aviation Weather

• Near term (2015-2019)
  – Continued enhancements to collaborative flight planning system
  – Increased mobile access for information and updates
  – Semi-automated TAFs
  – Enhanced automated weather observation systems
  – Improved weather camera systems
  – Increased automatic sensor inputs to weather observations
  – Increased minute-to-minute update capabilities
Mapping to ASBU Modules
Activities supporting NAV CANADA’s Air Navigation System Plan initiatives have been mapped to ICAO’s ASBU modules.
Performance Based Navigation (PBN)

- RF legs in STARS
- CMNPS & RNPC converted to PBN
- Low level airspace restructuring
- RNP AR procedures
- WAAS and LPV
- RNP approach design capability
- GBAS evaluations

**B0-05/B0-CDO**
Improved flexibility & efficiencies in descent profiles

**B0-10/B0-FRTO**
Improved operations through enhanced enroute trajectories

**B0-65/B0-AFTA**
Optimization of approach procedures including vertical guidance
### Communications

- **AIDC implementations**
- **AMHS implementation**
- **ADS-C replaces AFTN WPR**
- **Domestic CPDLC**
- **Greater usage of VDL**
- **SATCOM data in polar areas**
- **HF migration to back-up**
- **RCO redesigns**

#### Improved safety & efficiency through the initial application of data link enroute
- **B0-40/B0-TBO**

#### Improved flow performance through planning based on a network-wide view
- **B0-35/B0-NOPS**

#### Increased interoperability, efficiency and capacity through ground-ground integration
- **B0-25/B0-FFICE**

#### Enhanced operational decision through integrated meteorological information (planning and near-term service)
- **B1-105/B1-AMET**

---

*NAV CANADA*
Surveillance

- Surveillance Fusion System
- Expanded A-SMGCS
- MLAT & video to replace ASDEs
- Expanded MLAT
- WAM expansion projects
- Expanded domestic ADS-B
- Oceanic ADS-B

**B0-10/B0-FRTO**
Improved operations through enhanced enroute trajectories

**B0-15/B0-RSEQ**
Improve traffic flow through runway sequencing (AMAN/DMAN)

**B0-75/B0-SURF**
Safety & efficiency of surface operations (A-SMGCS Level 1-2)

**B0-85/B0-ASEP**
Air traffic situational awareness (ATSA)

**B0-86/B0-OPFL**
Improved access to optimum flight levels through climb/descent procedures using ADS-B
**B0-10/B0-FRTO**
Improved operations through enhanced enroute trajectories

**B0-15/B0-RSEQ**
Improve traffic flow through runway sequencing (AMAN/DMAN)

**B0-25/B0-FICE**
Increased interoperability, efficiency and capacity through ground-ground integration

**B0-30/B0-DATM**
Service improvement through digital AIM

**B0-35/B0-NOPS**
Improved flow performance through planning based on a network-wide view

**B0-70/B0-WAKE**
Increased runway throughput through optimized wake turbulence separation

**B0-85/B0-ASEP**
Air traffic situational awareness (ATSA)

**B0-86/B0-OPFL**
Improved access to optimum flight levels through climb/descent procedures using ADS-B

**RLatSM**
Upgraded ADS-C

**RLongSM, NAT & domestic**
Decision support integration

**Decision support tools**
FPL2012
CFPS
FSS upgrades

**ADS-B/GAATS integration**
Aeronautical Information Management (AIM)

- SNOWTAM replaces NOTAMJ
- Conversion of Canadian NOTAM
- Electronic publications online
- eAIP
- PED access
- RSC reporting interfaces
- Automated obstacle assessment
- Digital NOTAM
- eTOD project

B0-30/B0-DATM
Service improvement through digital AIM

B1-30/B1-DATM
Service improvement through integration of all digital ATM information

B1-31/B1-SWIM
Performance improvement through the application of SWIM
Aviation Weather

- Automated weather observation system
- Limited weather information system
- Human weather observation system
- ICAO bulletin format for AIRMET & SIGMET
- Weather cameras
- MET information available on PEDs
- CFPS displayed as geo-referenced data
- Semi-automated TAFs

**B1-105/B1-AMET**
Enhanced operational decision through integrated meteorological information (planning and near-term service)
Looking Ahead
Air Navigation System Plan update

• Doc 9750 and the ASBUS will be updated
• LEOS ADS-B is a game changing initiative
• Update one year early
• Updates to Operations Plan & FIR and departmental plans will follow
Thank you
Questions?
Discussion?