THE GREATER VANCOUVER REGION AND SOUTHERN VANCOUVER ISLAND OPERATING ENVIRONMENT IS A UNIQUE REGIONAL TRANSPORTATION NETWORK WITH RELIANCE ON AIR TRAVEL FOR BUSINESS, GOVERNMENT ACTIVITY, RECREATION, AND TOURISM.
COMPLEX AIRSPACE

Source: FDE, Google, RDPSR
Prepared by Operational Analysis (sf)
The Greater Vancouver Region and Southern Vancouver Island connects Canada to the global economy.

We have seen an increase of more than 100,000 movements across the region per annum compared to five years ago.

16% Increase in total flights
18% Increase in IFR flights
10% Increase in VFR flights

2013 vs 2018
WHERE DO CYVR FLIGHTS ORIGINATE FROM?

- **USA**
  - Seattle
  - Newark
  - Dallas
  - Chicago
  - Los Angeles
  - San Francisco

- **Europe**
  - London
  - Paris
  - Frankfurt
  - Amsterdam

- **Asia**
  - Hong Kong
  - Shanghai
  - Beijing
  - Taipei
  - Seoul
  - Tokyo

- **Australia/NZ**
  - Sydney
  - Brisbane
  - Melbourne
  - Auckland

- **Mexico**
  - Mexico City
  - Cancun
  - Puerto Vallarta
DIVERSE AND COMPLEX AIRSPACE

› Commercial IFR and VFR operations
  • Fixed wing of all performance types
  • Float Plane operations
  • Helicopter

› Flight Training
  • Major Flight Schools located at several regional airports

› Recreational
  • Including gliding and skydiving
PROJECT OVERVIEW

Why
To modernize the airspace and sustain safe operations in the long-term in anticipation of continued industry growth.

Who
Affected stakeholders in the Greater Vancouver Region and Southern Vancouver Island areas.

How
Consult, Design, Inform, Implement and Review opportunities to optimize the airspace infrastructure and operation including the following components:

- Airspace and Airway infrastructure as required
  - for both IFR and VFR
- Airspace Classification
  - Control zones and surrounding airspace
- PBN based SID, STAR and IFR Approaches for Terminal Operations at principal and regional airports
- Delivery of IFR and VFR control service
- Charts and Publications
- Noise and Environmental considerations
PBN BASED AIRSPACE SYSTEM

Modern Area Navigation (RNAV) in all phases of flight

› Departures
  • RNAV SIDs

› En-route
  • RNAV/GNSS routes
  • “Structure where structure is required”

› Arrivals
  • RNAV STARs to major airports
  • RNAV (GNSS) and RNAV (RNP) Instrument Approach procedures
  • Established on RNP AR (EoR) at CYVR
PBN STANDARD INSTRUMENT DEPARTURES

RNAV based SID procedures

- Coded and available in aircraft FMS
- Provide multiple departure paths
- Reduce ATC and Aircrew workload
PBN STANDARD INSTRUMENT DEPARTURES

RNAV based SID procedures

› Support Continuous Climb Operations (CCO)

• Optimum engine thrust for climb

• Minimise climb interruption or level-off

• Reduced fuel burn and GHG emissions

• Potential noise allowing for track dispersal or concentration
PBN BASED ENROUTE STRUCTURE

Low or High level RNAV routes

- Structured routes to provide
  - Removed reliance on ground-based NAVAIDS
  - Facilitate traffic flows to and from busy Terminal areas
  - Linked to PBN Arrival and Departure procedures
  - Reduced airspace complexity and workload
RNAV STANDARD TERMINAL ARRIVALS

PBN based STAR procedures

- Coded and available in aircraft FMS
- Link En-route structure to Instrument Approach Procedures
- Reduce ATC and Aircrew workload
- Provide accurate descent planning
RNAV STANDARD TERMINAL ARRIVALS

PBN based STAR procedures

- Support Continuous Descent Operations (CDO)
  - Descent from high-level cruise
  - Predictability for descent planning
  - Minimise descent interruption or level-off
  - Potential noise and fuel burn benefits
RNAV INSTRUMENT ARRIVAL PROCEDURES

Global Navigation Satellite System (GNSS) based approaches

- RNAV (GNSS) procedures
  - Coded and available in aircraft FMS
  - Linked to STAR procedures
  - Remove reliance on ground-based systems
  - Existing procedures modernised with new design criteria
RNAV INSTRUMENT ARRIVAL PROCEDURES

Global Navigation Satellite System (GNSS) based approaches

- Support Continuous Descent Operations (CDO)
  - Continuous descent to runway
  - Allow for accurate descent planning
  - Reduction in ATC and flight crew workload
  - Potential noise and fuel burn benefits
Required Navigation Performance (RNP) Instrument Approaches

- Continuous descent to runway
- Linked to STAR procedures
- Reduced track mileage when compared to conventional approaches
- Reduction in ATC and flight crew workload
Required Navigation Performance (RNP) Instrument Approaches

- Support CDO
  - Reduced fuel burn and GHG emissions
  - Potential noise benefits from precise track containment
  - Potential noise and fuel burn benefits
  - Can be used during Simultaneous Independent Parallel Operations
RNAV INSTRUMENT ARRIVAL PROCEDURES

Established on RNP AR (EoR)

› New ICAO separation standard for RNP AR
  • Considers RNP AR aircraft “established” on final when flying the approach
  • Allows for “side-by-side” RNP AR approaches
  • Can be used during Simultaneous Independent Parallel Operations with other RNP AR, RNAV or ILS approaches
  • Safely increases RNP AR approach usage, resulting in reductions in aircraft noise, fuel burn and GHG emissions
RNAV INSTRUMENT ARRIVAL PROCEDURES

Established on RNP AR (EoR)

› New ICAO separation standard for RNP AR

  • EoR planned for Vancouver International as part of Modernisation Project

  • NAV CANADA first to use new ICAO standard at Calgary Airport in November 2019

  • EoR is being looked at by airports such as Heathrow, Brisbane and Houston Airports
A MODERNISED AIRSPACE CONCEPT

In collaboration with stakeholders

› Develop a concept that supports sustained current and future operations across the region

› Address anticipated future capacity demand and industry growth

› Leverage modern navigation technologies

› Minimise environmental impacts