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Remotely Piloted Aircraft System (RPAS) Project

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RUSI(NS)

Virtual, September 2022

CANADIAN ARMED FORCES
FORCES ARMÉES CANADIENNES

National Defence Défense nationale

Canada

Image from GA ASI

Outline

- Project Status
- Project Overview
- Domestic Operations

Project Status – Timeline

https://www.canada.ca/en/department-national-defence/services/procurement/remotely-piloted-aircraft-system.html - 24 Aug 2022 @1257 UTC

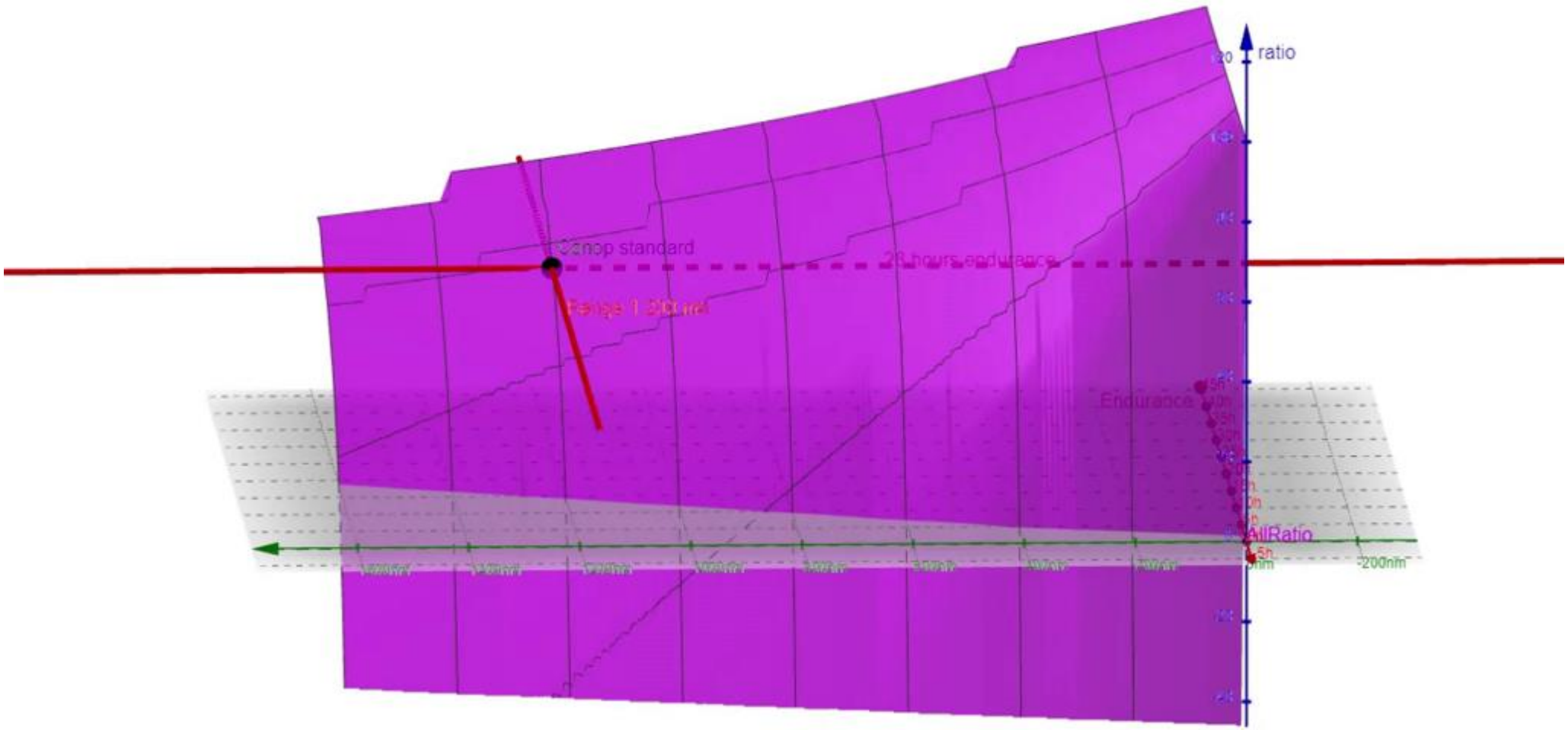
Currently in Phase 3: Definition

1. Identification | 2. Options analysis | 3. Definition | 4. Implementation | 5. Close-out

3. Definition

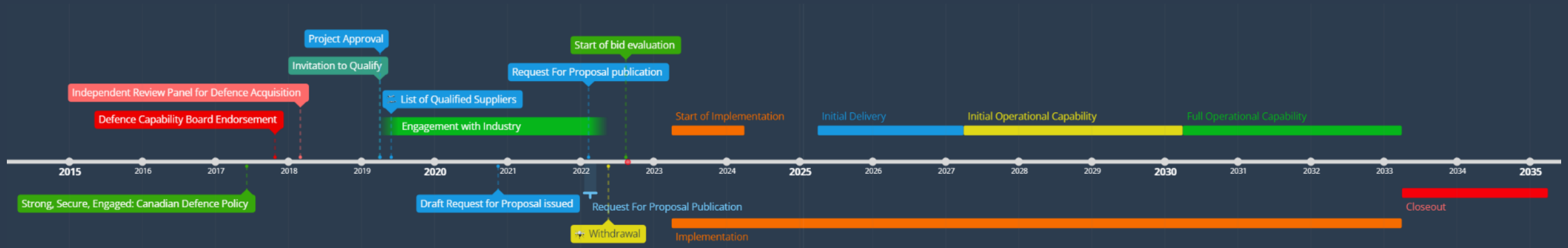
- Project approval: April 4, 2019
- Invitation to qualify: April 5, 2019
- Request for proposal: February 11, 2022
- Bid evaluation complete: 2022-23

Links:
Internal Panel on Canada's Future Role in Afghanistan:
https://publications.gc.ca/collections/collection_2008/dfait-maeci/FR5-20-1-2008E.pdf
Internal Audit of the JUSTAS Project:
https://www.canada.ca/en/department-national-defence/corporate/reports-publications/audit-evaluation/internal-audit-joint-unmanned-surveillance-target-acquisition-system-justas-project.html
Strong, Secured, Engaged: Canada's Defence Policy:
https://www.canada.ca/en/department-national-defence/corporate/policies-standards/canada-defence-policy.html


ratio
Canop standard
2R hours endurance
Endurance
AllRatio
200nm

Project Status – Milestones

Milestone	Date
Release of RFP	11 Feb 2022
Start Implementation	FY 2023/2024
Initial Delivery	FY 2025/26 to 2026/27
Initial Operational Capability	FY 2027/28 to 2029/30
Full Operational Capability	FY 2030/31 to 2032/33



Project Status – Scope

- Deliver ISTAR over three LoT
  - 2 deployed
  - 1 domestic
- Integrate within a System of Systems providing persistent capabilities
- Complement, not replace, existing RCAF platforms
- Infrastructure:
  - 1 Ground Control Centre in National Capital Region
  - 2 Air Maintenance Detachments in eastern and western Canada
  - 1 Arctic Forward Operating Location
- In Service Support
  - 25 year + life cycle

Project Status – Possible Platform

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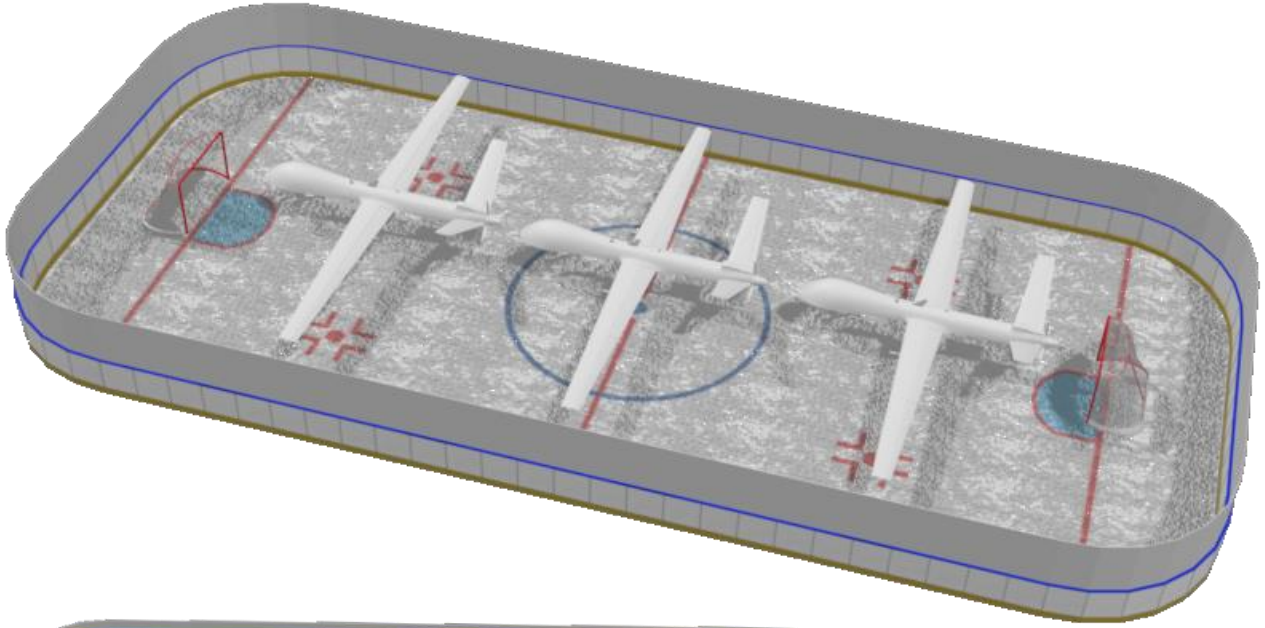
Sky Guardian

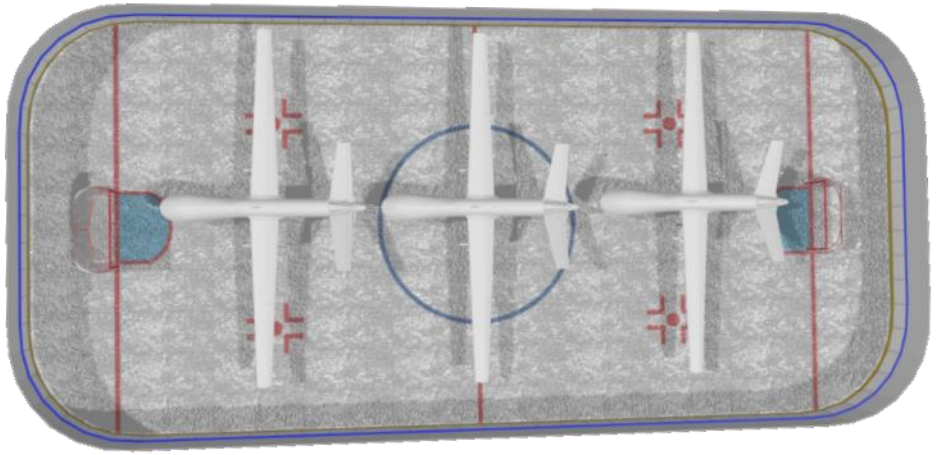
GENERAL ATOMICS AERONAUTICAL

CAE L3HARRIS™ MDA

Or review procurement strategy.

Project Status – Possible Platform





Project Status – RPAS Payloads

- Expected to include:
  - HD EOIR Turret
  - Multi-Mode RADAR: Synthetic Aperture Radar (SAR) and Inverse SAR (ISAR) with both maritime and land radars (or modes)
  - ESM
  - Automatic Identification System (AIS)
- Link 16, VMF, TCDL…

- Other Systems as required post Full Operating Capability (FOC)
  - Sigint Pod (SIP)

Project Status – Weapons

- Multi-mode Precision Guided munitions:
  - Low Collateral Damage Estimate (CDE) weapons
  - Large effect weapons (250 to 500lb class)

- Requirement to understand how RPAS weapons integrate with CAF multi-domain effects

Project Outcome – CONOPS

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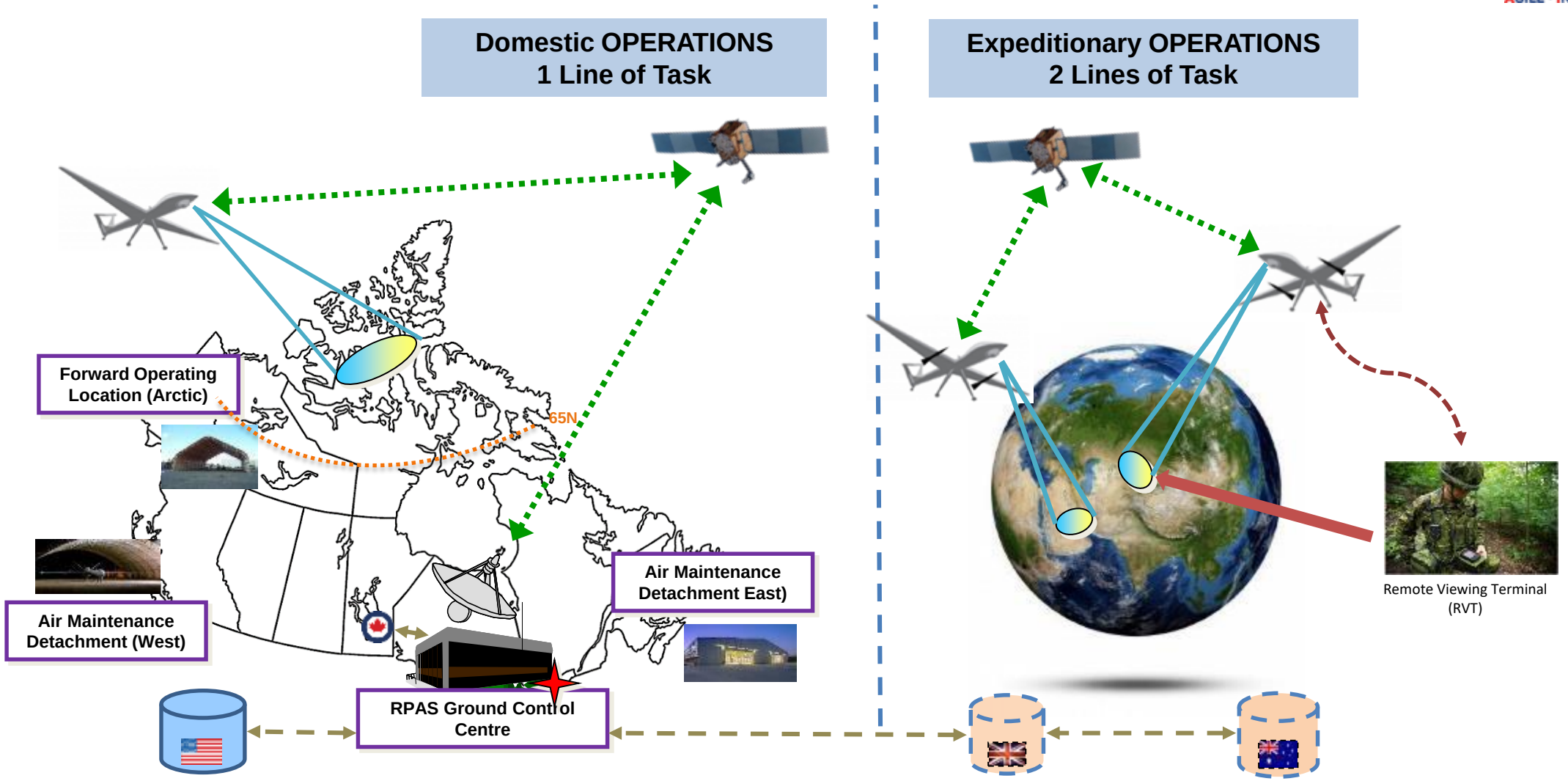
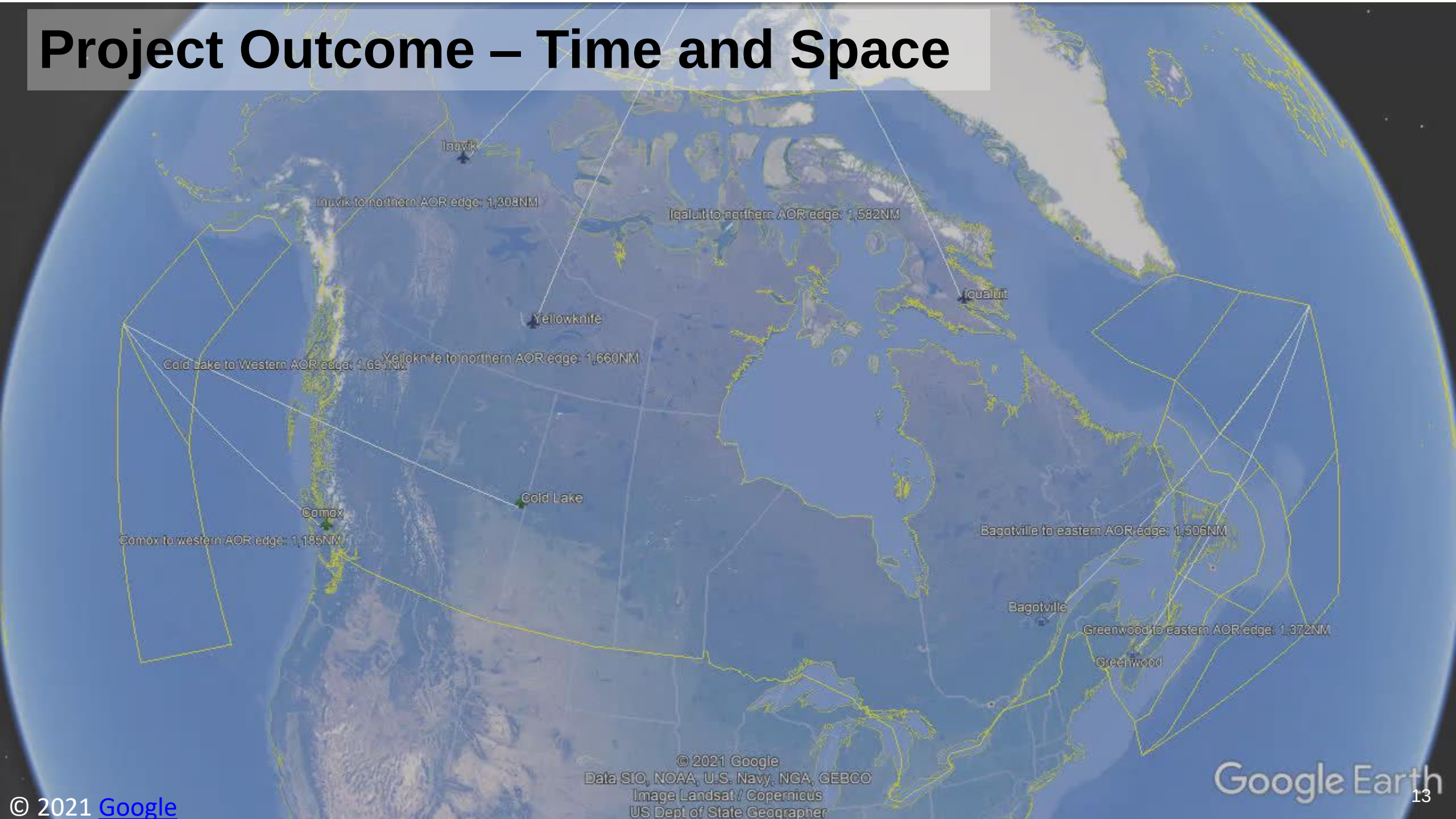


Project Outcome – Missions

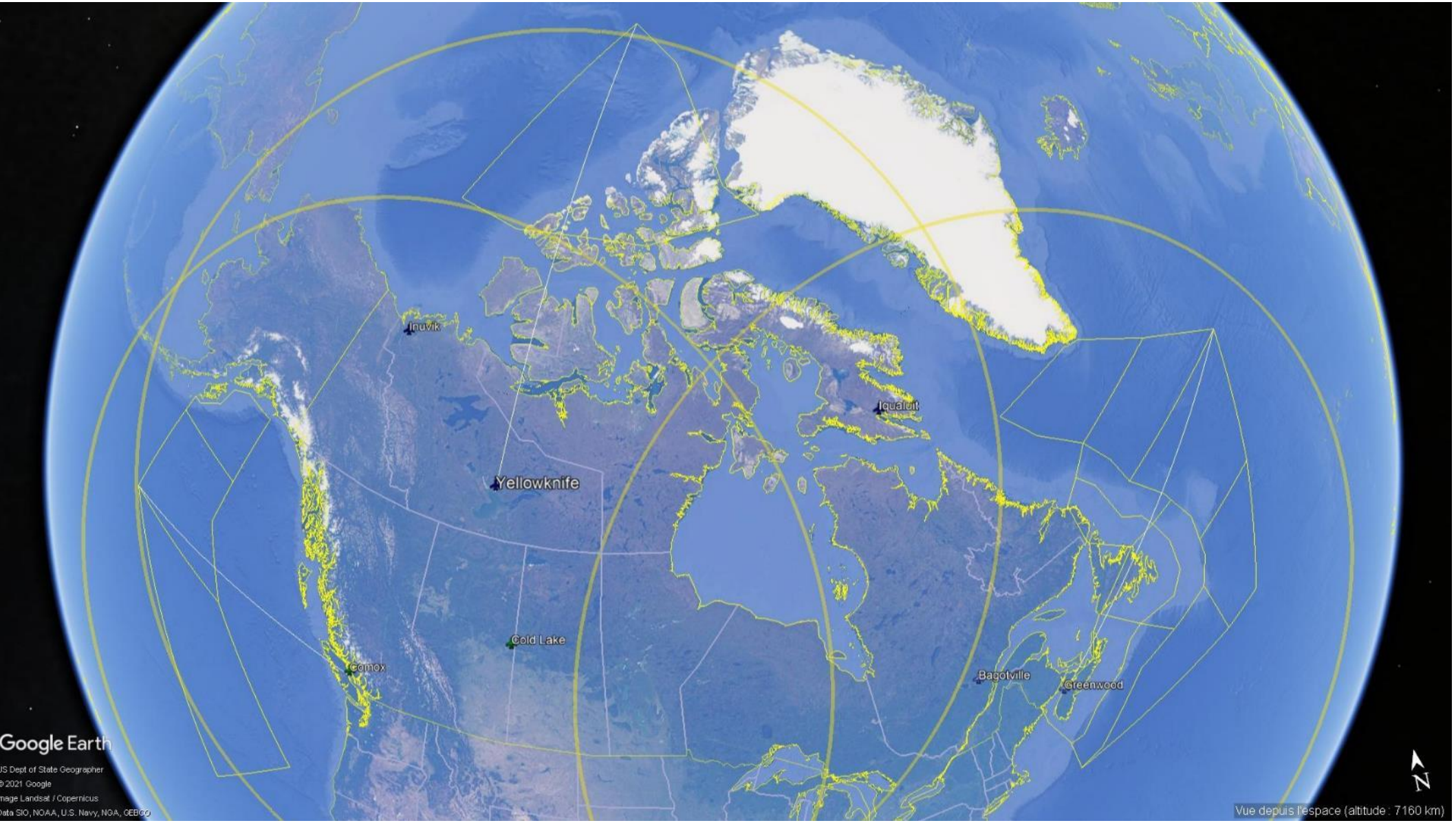
Domestic Missions	NORAD Missions	Deployed Missions
• Canadian sovereignty and patrol • Fisheries and pollution patrol • Surveillance for large events (e.g. Olympics) • Aid to Civil Power during and after natural disasters	• Aerospace Warning • Aerospace Control • Maritime Warning (2006)	• Assistance during and after natural disasters • Intelligence, Surveillance and Reconnaissance • Maritime Patrols • Direct support to deployed commanders including kinetic effects

Operation LIMPID (detect threats to Canada)
Operation LENTUS (response to natural disasters)
Operation CADENCE (G7 security support to RCMP)

Project Outcome – Time and Space



Project Outcome – Domestic Outlook



Arctic Forward Operating Location

- Presence in the Arctic for sovereignty operations and joint training

- Infrastructure for two aircraft and technicians

Project Outcome – Expeditionary Capability

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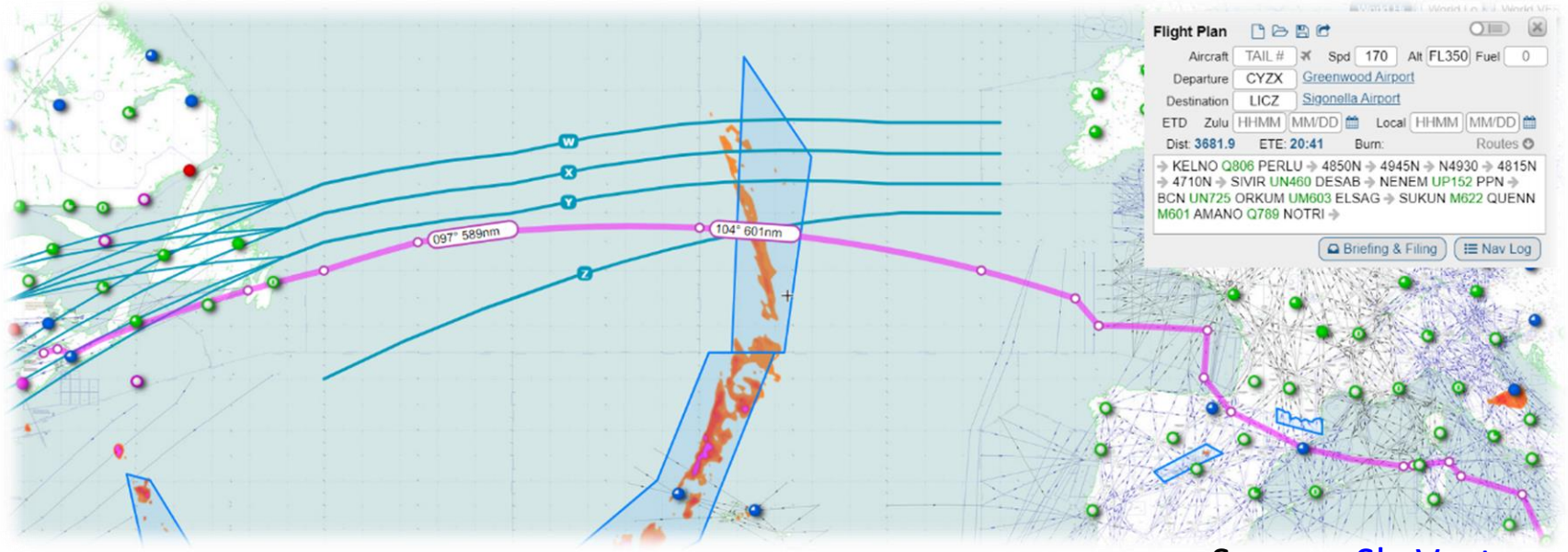
- Direct persistent surveillance and kinetic support to deployed forces
- Minimum in-theatre footprint
- Rapidly deployable



Source: SkyVector

Project Outcome – Personnel

- ~280 Personnel
- 18 crews
- ~80 maintainers
  - RPAS Technicians: Single technician trade for first line maintenance
- GCS Crew:
  - 1 Pilot
  - 1 Sensor Operator
  - 1 Mission Intelligence Coordinator
- Additional Crewmembers: Image Analysts, SIGINT Analysts

Challenges - Integration

- Distributed squadron
  - Aircrew located separately from aircraft and maintainers
- Deployed operations
  - RPAs transferred to theatre commanders but with cockpit and crews pooled
  - Integration with allies on coalition operations
- Information
  - Massive network bandwidth and storage requirements
  - Changes the way information is processed and intelligence is generated
- No legacy fleet culture
  - Little experience
  - Different support requirements
  - Different psychological effects

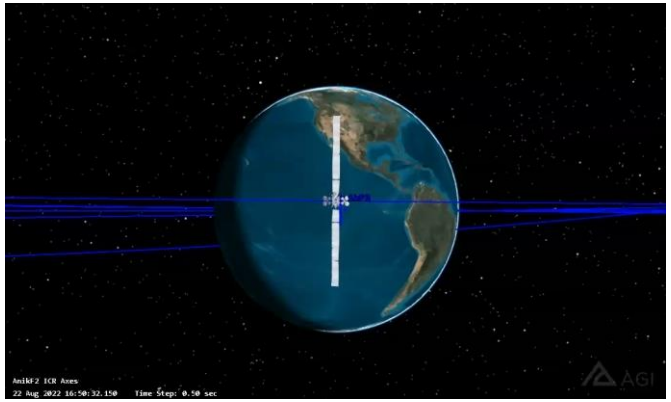
Challenges - Certification

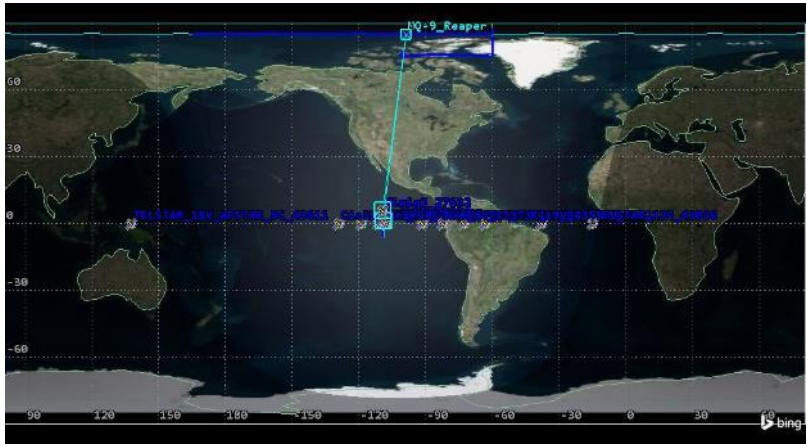
- Certification process is known and robust, but RPAS presents specific challenges
- Regulatory environment for Flight in Non-segregated Air Space (FINAS) is being defined
- Arctic Operations north of 65 degrees latitude
  - Temperatures below -35C
  - Low CRFI
  - Distance between aerodromes
  - SATCOM and PNT availability

Source: [Map of Canada Wtih Latitude and Longitude | Canada Latitude and Longitude Map (mapsofworld.com)]

Challenges – Arctic Communications

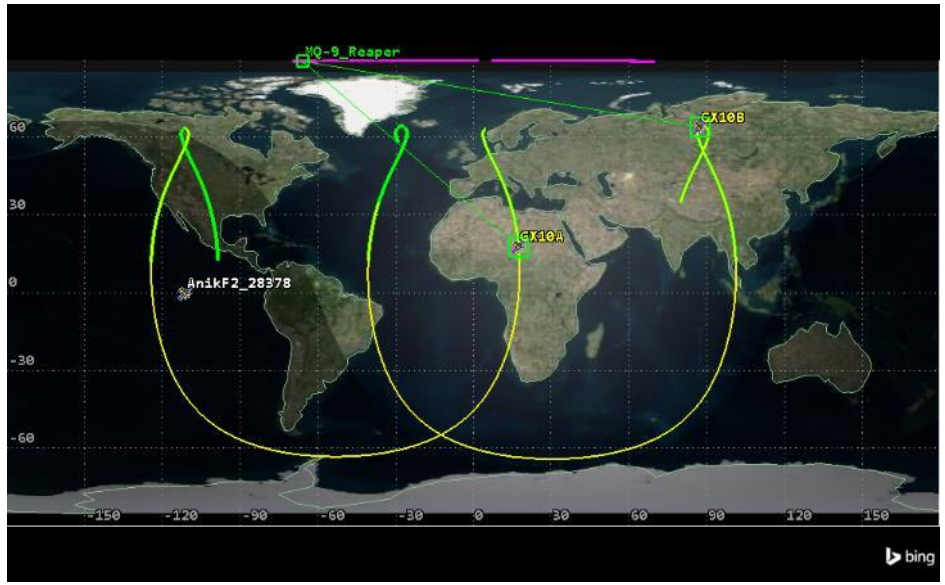
- Multiple options
  - GEO – standard for RPAS
    - Earth rotation synchronous satellites above the equator
    - Reduced signal strength and LOS angle as the RPA moves north
    - Low line of sight angle – reduced bandwidth, body masking

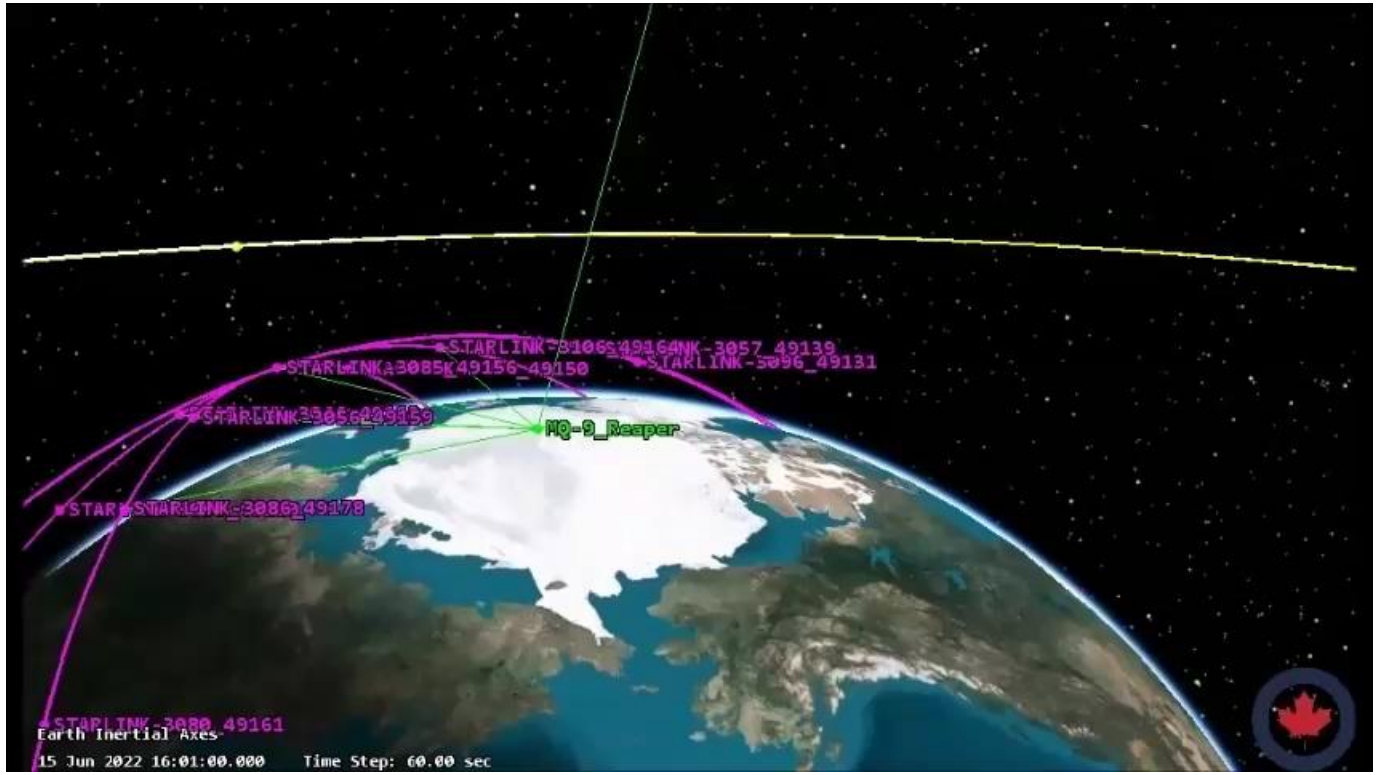




Challenges – Arctic Communications

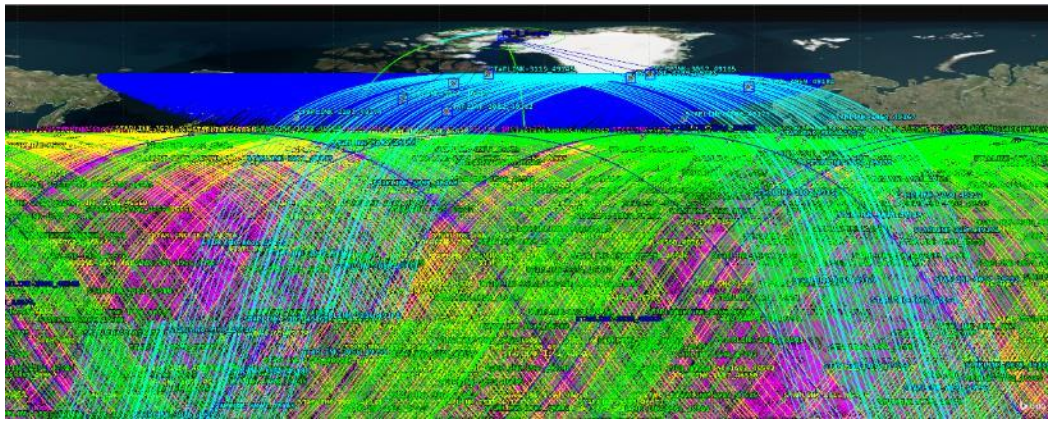
- Multiple options
  - HEO – Few options available
    - Long “hang” times above one of the poles
    - Longer distance for communications





Challenges – Arctic Communications

- Multiple options
  - LEO
    - Requires many satellites for global coverage
    - In the Arctic, about 15 minutes per satellite
    - Starlink used in this example due to their recent use in Ukraine and their impressive number of space vehicles.



Summary

- Canada will procure an RPAS to provide 3 Lines of Tasking
- ISR operations with kinetic effects
- Domestic and expeditionary operations
- Canada’s environment provides unique challenges

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Questions?

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