



Government  
of Canada

Gouvernement  
du Canada

ROYAL CANADIAN  
AIR FORCE



AVIATION ROYALE  
CANADIENNE

# Future Fighter Capability Project

Replacing Canada's  
Current Fighter Aircraft

# Outline - Policy



**1** Policy

**2** Environment

**3** Future Fighter Capabilities

# DISCLAIMER



The information provided today is subject to change and is intended for discussion purposes only. Due to the interactive nature of the Future Fighter Industry Day, any verbal statements made by Canada's representatives will not be binding for purposes of the Suppliers List Invitation or the procurement process. Only the information released by Canada in the Suppliers List Invitation or in other procurement documents should be followed when preparing a response. Any verbal comments by Canada must not be construed as a preference, rejection or assessment of any solution. Canada reserves the right to consider comments and suggestions received during the Future Fighter Industry Day.

# Canada's Defence Policy



National Defence / Défense nationale

CANADIAN ARMED FORCES  
FORCES ARMÉES CANADIENNES

Canada

**STRONG  
SECURE  
ENGAGED**

**PROTECTION  
SÉCURITÉ  
ENGAGEMENT**

CANADA'S DEFENCE POLICY

LA POLITIQUE DE DÉFENSE DU CANADA

# SSE - New Vision



- **Strong at home**, with a military ready and able to defend Canada's sovereignty, and to assist in times of natural disaster, support search and rescue, or respond to other emergencies
- **Secure in North America**, active in a renewed defence partnership in NORAD and with the United States
- **Engaged in the world**, with Defence doing its part in Canadian contributions to a more stable and peaceful world

# SSE - New Approach



*“...Being strong, secure and engaged in the context of an extraordinarily complex security environment requires a fundamentally new, agile, modern and responsible approach to defence...”*

- **ANTICIPATE ...**
  - ... emerging threats and challenges
- **ADAPT ...**
  - ... to a fluid and highly volatile global security environment
- **ACT ...**
  - ... to act decisively with effective military capability through the execution of core missions

# SSE - CAF Core Missions



*"...the Royal Canadian Air Force must increase interoperability with its key partners and core allies. It will need to sustain existing capacity and continue to acquire modern aerospace capabilities that have an operational advantage in relation to present and future potential adversaries..."*

## Ensures the Canadian Armed Forces will be prepared to:

<b>1</b>	Detect, deter and defend against threats to or attacks on Canada
<b>2</b>	Detect, deter and defend against threats to or attacks on North America in partnership with the United States, including through NORAD
<b>3</b>	Lead and/or contribute forces to NATO and coalition efforts to deter and defeat adversaries, including terrorists, to support global stability
<b>4</b>	Lead and/or contribute to international peace operations and stabilization missions with the United Nations, NATO and other multilateral partners
<b>5</b>	Plus others

# SSE - Future Fighter Operations



## Deterrence

*"...Canada benefits from the deterrent effect provided by its alliances (e.g., NATO and NORAD), and takes seriously its responsibility to contribute to efforts to deter aggression by potential adversaries in all domains..."*

- **Global Threat**
  - Operational environment is more lethal and complex
    - Advanced Fighters
    - Anti-Access Area Denial (A2AD) Surface-to-Air missile systems;
    - Evolving cyber threat
    - Contested Control of the Electro Magnetic Spectrum
    - Proliferation of increasingly technologically advanced equipment
- **Canada will be prepared for future operations with the acquisition of 88 advanced fighters**
  - Seamless interoperability with key allies
  - The platform must be capable, upgradeable and resilient throughout its service life
  - Capabilities that have an operational advantage in relation to present and future potential adversaries

# SSE - Security & Interoperability



## Interoperability

*“Building on our shared values and long history of operational cooperation, the Five-Eyes network of partners, including Canada, the United States, United Kingdom, Australia and New Zealand, is central to protecting Canada’s interests and contributes directly to operational success.”*

- **5/2 Eyes Intelligence Mission Data**
  - Robust operational mission data is critical for combat effectiveness, lethality, and survivability
  - The programming of each sensor requires mission data at the 5 Eyes (CAN/UK/US/AU/NZ) level for Contingency Operations and the 2 Eyes (CAN/US) level for NORAD operations
- **5/2 Eyes Intelligence Affects the Fighter Ecosystem**
  - Mission planning
  - Aircraft, offensive/defensive systems programming
  - Support equipment: debriefing/simulators/maintenance
  - Growth path to 2060 and beyond

# Outline - Environment



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# Environment - CF-18 History



**NATO/Contingency Operations**

Iraq 1  
Desert Storm

Bosnia-Kosovo  
Allied Force  
OP Echo

Libya  
OP Mobile

Ice/Rom/Lithu  
OP Reassurance  
(2013-present)

Iraq/Syria  
OP Impact  
(Mid East)

1982

1991

1997-99

2011

2013

2015

Cold War alert  
1953-1993

Counter Drug  
Operations  
1993-1999

G8/20  
2002/2008

Olympics  
2010

NORAD Operations

9/11

Operation Noble Eagle

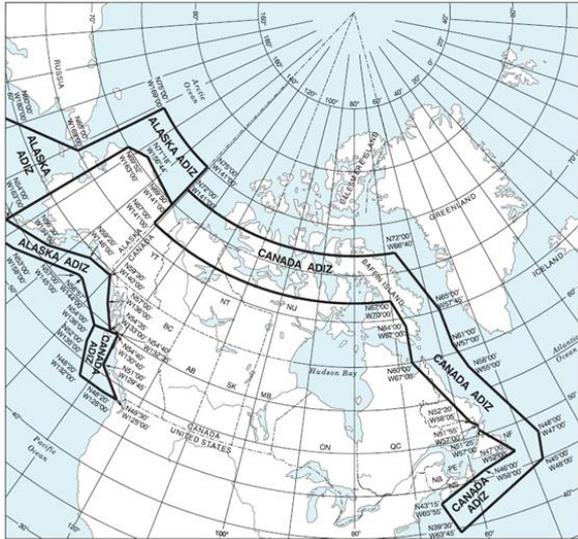


# Environment - Threats



- 2025-2060+ (life of Future Fighter)
  - Ability to maintain Operational Advantage
- Both NORAD and NATO context
  - Threats at home and overseas
  - Geography: Domestic and contingency deployments
  - Civilian traffic is more sophisticated
- Threats that are widely proliferated, as well as emerging threats
  - Regional actors with advanced systems
- Advanced adversary fighters
  - Advance technology with advanced weaponry
- Mobile, theatre wide (300+ km range) surface-to-air
  - Active and passive detection/guidance
  - Difficult to detect, ID, track and suppress/target

# Environment - NORAD



- NORAD is a US and Canada bi-national agreement with missions of Aerospace Warning, Control and Maritime Warning for North America
- Aerospace Warning
  - Includes: detection, validation and warning of attack
- Aerospace Control (detect, deter and defend)
  - Includes: air sovereignty and air defense of North American airspace
- Operation NOBLE EAGLE (ONE)
  - 16 years of prudent deterrence and effective mission

# Environment - NORAD

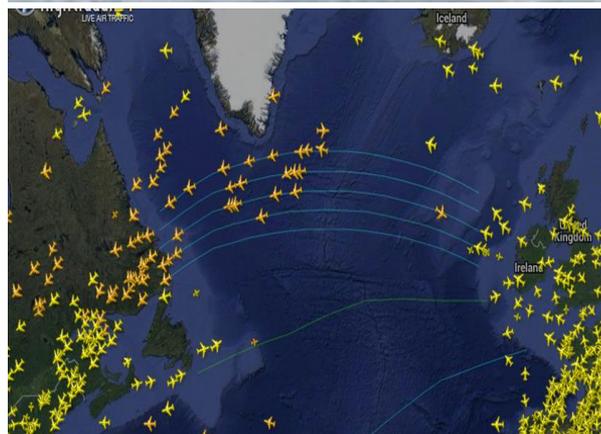


## NORAD

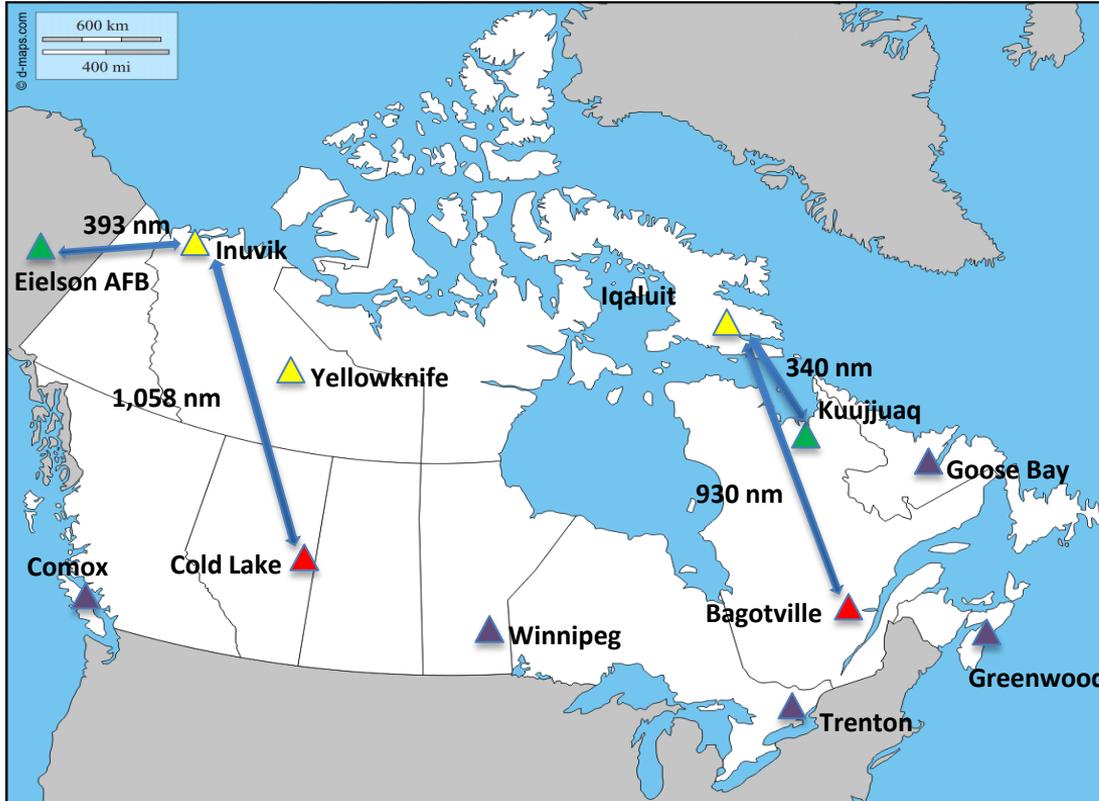
- Detect, deter, defeat threats
- Current/Future threats
  - Long Range Aviation
  - CM KH-101/102
  - Fighters SU-35S/57
  - Contested Airspace

## Operation NOBLE EAGLE

- Higher performance platforms
- Cruising Speeds higher
- Cruising Altitude higher
- Escort to destination
- High-Fast/Low-Slow
- Congested Airspace



# Environment – Geographical

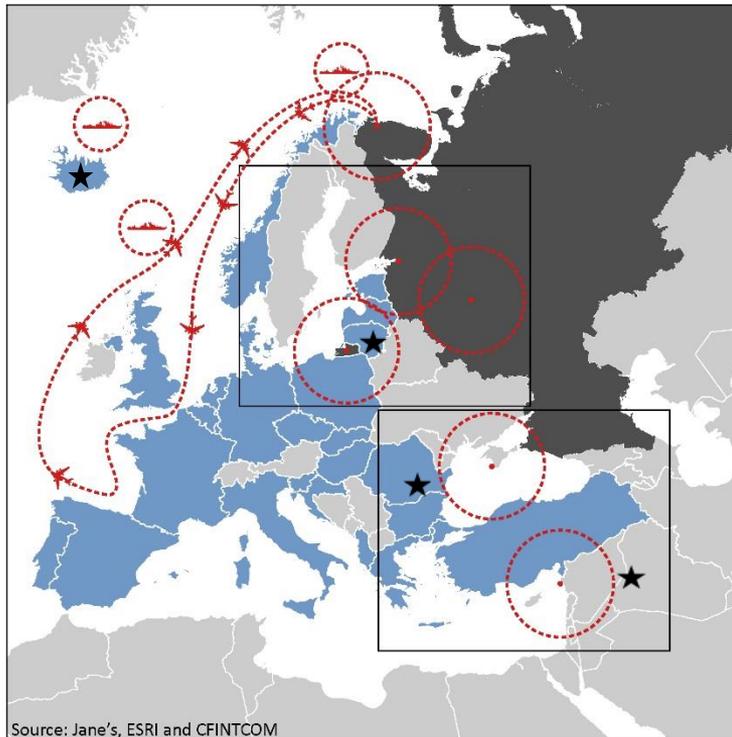


Land Mass = 10M Km<sup>2</sup> / 3.9M M<sup>2</sup>  
Coastline = 243,000 Km / 151,000 M  
East-West = 9,300 Km / 5,780 M  
North-South = 4,600 Km / 2,900 M

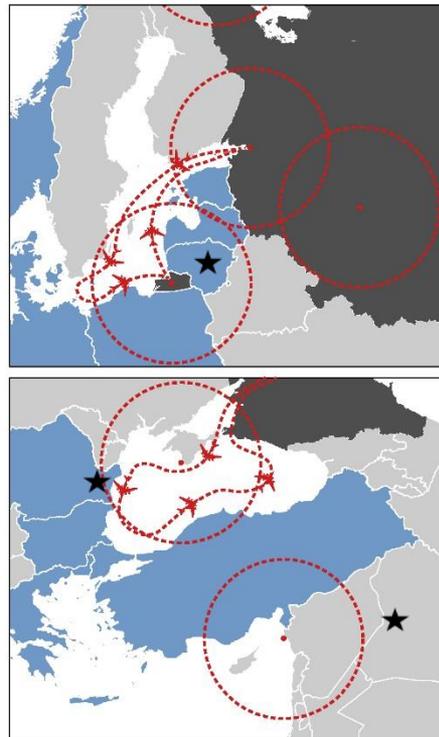
## Performance Challenges

- Alert fighter must be ready to carry out missions 24/7 for NORAD or ONE with one configuration
- Arctic Operations requires
  - Long range, supersonic offensive/defensive capabilities
- ONE Missions requires
  - High altitude, supersonic, armed, immediately after take off

# Environment - NATO



Source: Jane's, ESRI and CFINTCOM



★ CF-18 Operations

- Environment that can be described as; highly sophisticated, agile, digitized, mobile and passive.
- Advanced current fighters and future advanced fighter threats
  - SU-35S
  - SU-57
- Long Range Aviation threat
  - Bears
  - Blackjacks
- Cruise Missile threats
  - KH-101/102
- Anti-Access Area Denial (A2AD)
  - S300/400
- Air Defence equipped Ships with advanced systems
  - S300+
- Proliferation of ever increasing technologically advanced weaponry
  - All of the above in regional conflicts

# Future Fighter Capabilities



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# Future Fighter Capabilities



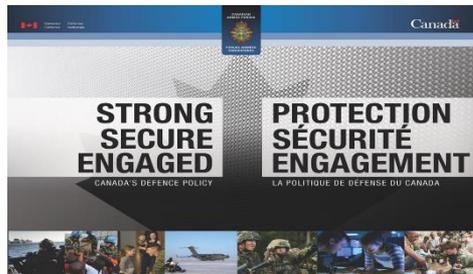
- The SOR is aligned with SSE
  - Interoperable with NORAD and NATO
  - Adherence with 5/2 Eyes intelligence levels
  - Provide Operational Advantage against technologically advanced threats
- Fully reflects the Government of Canada's intent to acquire a Future Fighter through a competitive process
  - Our missions and roles and commitments have not changed
  - Our requirements are based on Policy and Environment

# Future Fighter Capabilities



<b>1</b>	<b>Interoperability : NORAD, NATO, safeguard shared 5/2 Eyes intelligence</b>
<b>2</b>	<b>Upgradeability : Ability to maintain Operational Advantage against current and future threats</b>
<b>3</b>	<b>Performance: Range, endurance and speeds required in NORAD and NATO mission configurations</b>
<b>4</b>	<b>Awareness : Ability to gather intelligence, detect, track, identify, assess in permissive and contested environments</b>
<b>5</b>	<b>Survivability : Ability to operate in permissive and contested environment</b>
<b>6</b>	<b>Lethality : Ability to effectively carry out its assigned tasks in permissive and contested environment</b>
<b>7</b>	<b>Sustainability: Ability to sustain Force Generation and Force Employment systems throughout service life</b>

# Summary



Canada 