

Integrated Aviation Management Project

IAMP CIAM 540

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Air Navigation Services Perspective

Francis SCHUBERT

Outline

- Introduction
- Policy drivers
- Policy goals
- Designation of a service provider
- Market
 - Geographical market
 - Competitive dimension
- Performance
- Financing
- Civil-Military cooperation
- Strengths
- Challenges

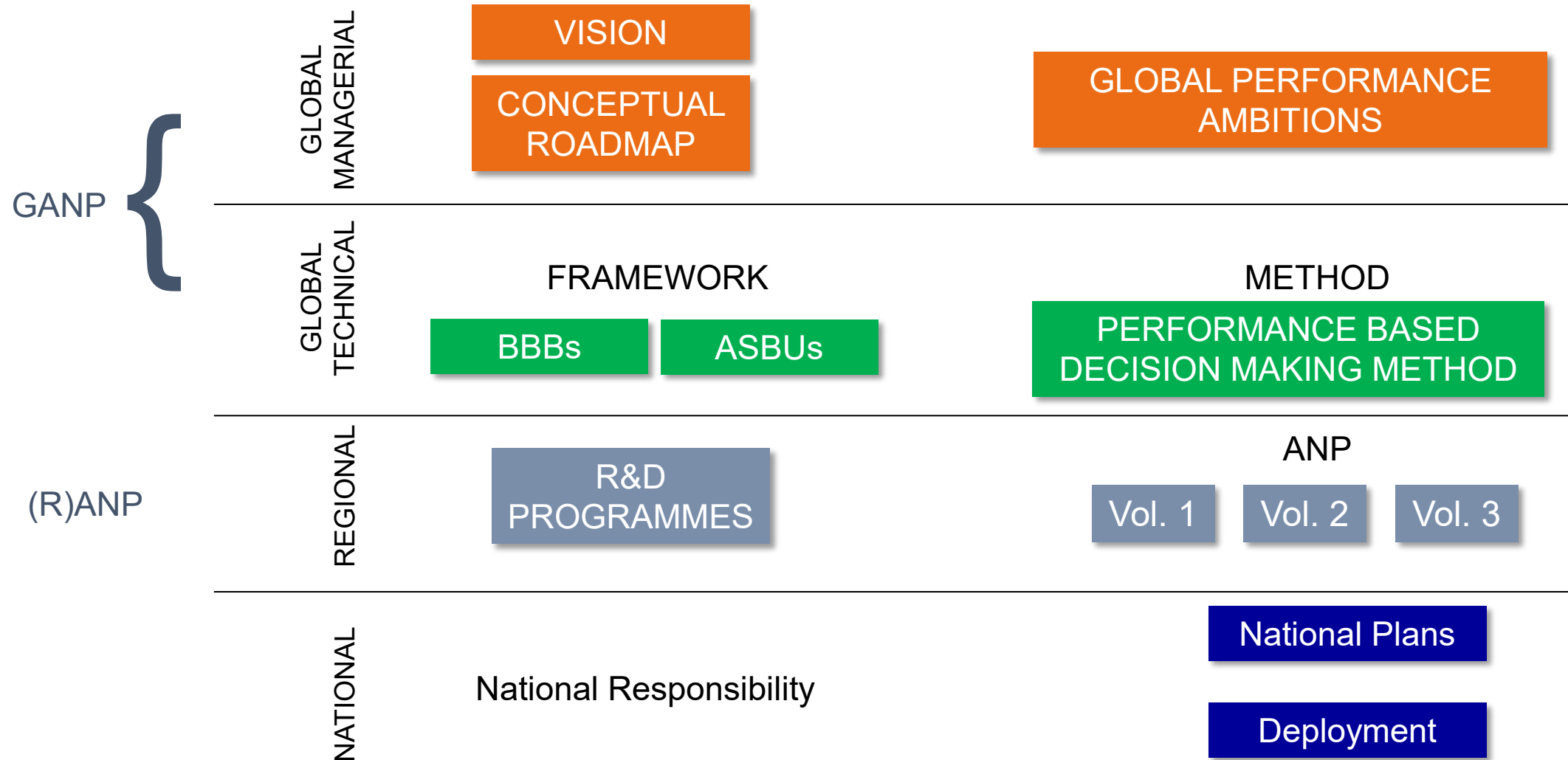
3 policy drivers

- Fulfilment of States' obligations under Art. 28 CC
- Safeguard of national interests:
 - Sovereignty and National security
 - Economic interests
- Fulfilment of States national public service obligations

Air Navigation Facilities and Standard Systems

- "Each contracting state undertakes, so far as it may find practicable, to:
 - provide, in its territory, airport, radio services, meteorological services and other air navigation facilities to facilitate international air navigation, in accordance with the standards and practices recommended or established from time to time, pursuant to this convention;
 - adopt and put into operation the appropriate standard system of communications procedure, codes, markings, signals, lighting, and other operational practices and rules which may be recommended or established from time to time, pursuant to this convention;
 - collaborate in international measures to secure the publication of aeronautical maps and charts in accordance with standards which may be recommended or established from time to time, pursuant to this convention.

The ICAO ANS planning framework



- Role that ANS play in safeguarding national sovereignty
- Distinct from ICAO objectives and not addressed by ICAO
- Because ANS have the technical means to maintain a permanent and full monitoring of all air navigation activities
- In most countries, not an exclusive mandate, but done in support to the military authorities who own the process

Air Navigation Services as a "public service"

- Public Safety
 - *"Public safety... is the protection of lives and goods of individuals against dangers resulting from natural phenomena or against man created risks..."*
- Support to mobility
 - The satisfaction of peoples' mobility needs and to secure access to remote locations.

States and public service obligations



- Fulfilment of States obligations under Art. 28 Chicago Convention
 - Support the safety, efficiency and reliability of international air navigation
 - Provide adequate facilities and services to that effect
 - Compliance with ICAO SARPS
 - Compatibility with regional planning
- Safeguarding State sovereignty under art. 1 CC
 - Avoidance of critical dependencies
- Public service obligations
 - Retention of minimum level of service capability
 - Ensure unhindered access to the country
- The ANSP might have key goals of its own that may only be of secondary interest for the State (e.g. development of commercial non-core businesses)
 - This raises the question of how much entrepreneurial freedom the State wishes to grant its national ANSP.

- Contracting States shall determine, in accordance with the provisions of this Annex and for the territories over which they have jurisdiction, those portions of the airspace and those aerodromes where air traffic services will be provided.
 - Annex 11, § 2.1.1
- When it has been determined that air traffic services will be provided, the States concerned shall designate the authority responsible for providing such services...The authority responsible for establishing and providing the services may be a State or a suitable Agency.
 - Annex 11, § 2.1.3

Organisational challenges

- Avoid burdening the State's finances
- Avoid conflicts of interests:
 - ANSP – State authorities
 - ANSP – Customers
- Ensure adequate political control
 - Safeguarding of States' strategic interests

States' responsibilities

Regulatory function



Definition of the detailed regulatory framework
Definition of compliance criteria

Certification function



Verification that an operator meets the requirements for the performance of a regulated function

Supervisory function (oversight)



Verification of compliance with the regulatory framework

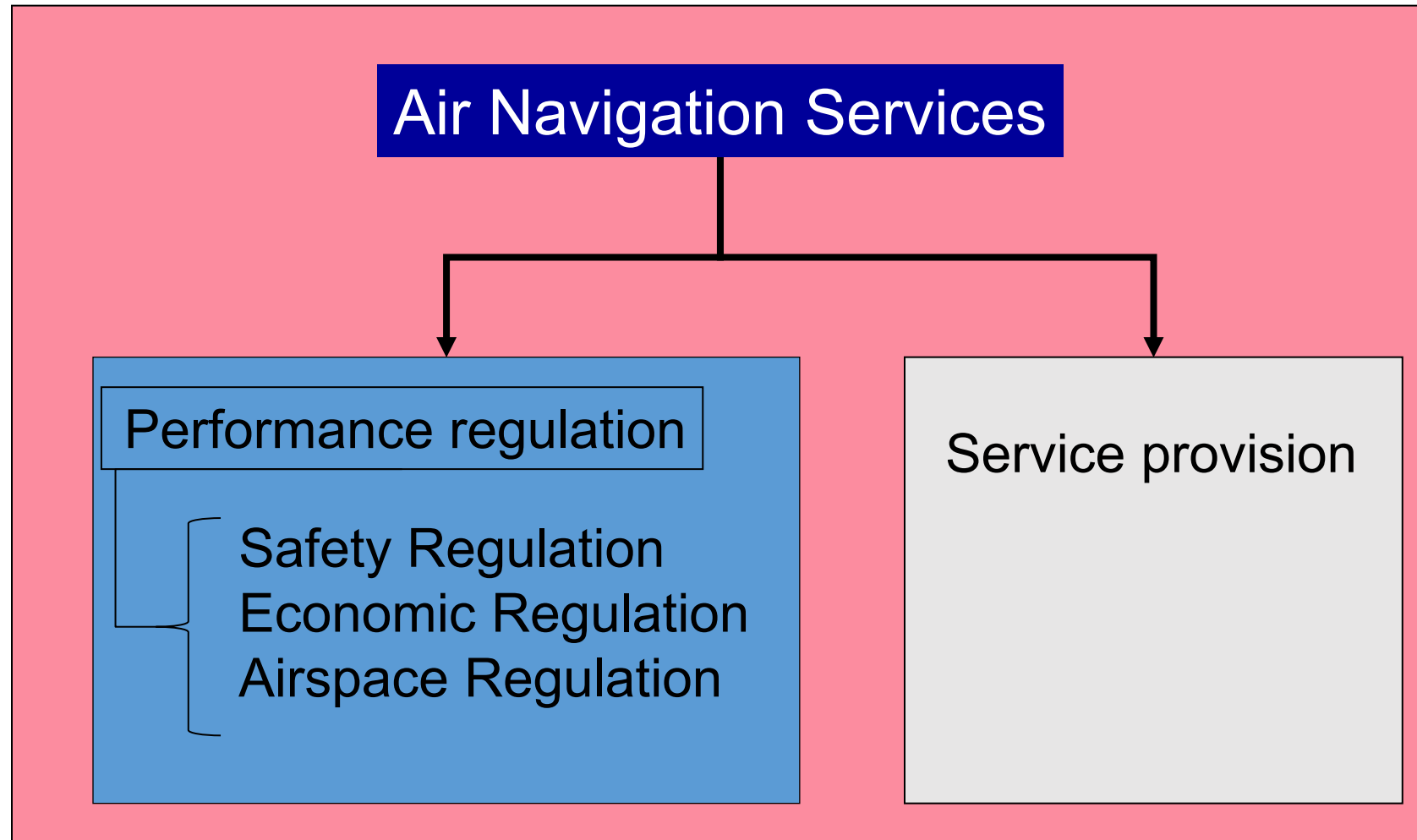
Audit function

A specific certification/supervisory methodology



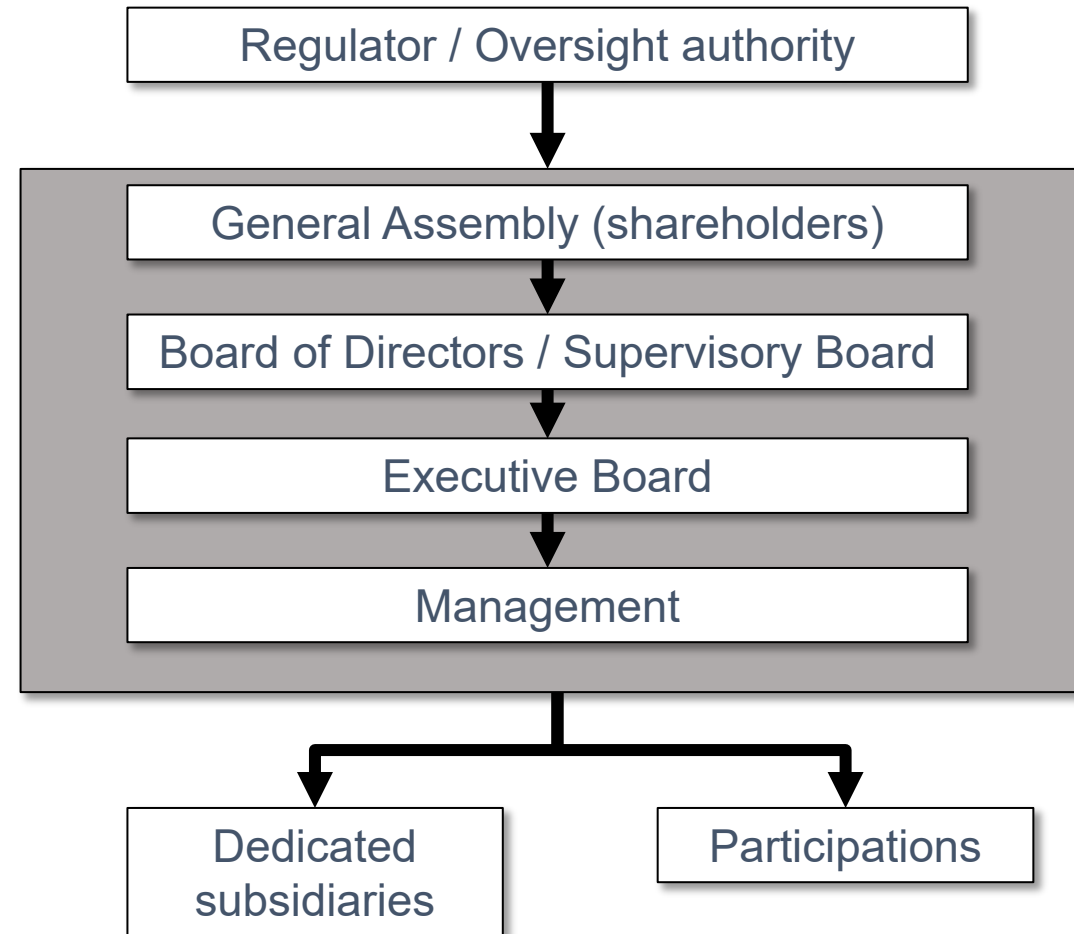
Verification of compliance with defined compliance criteria

Regulatory function vs. Service provision

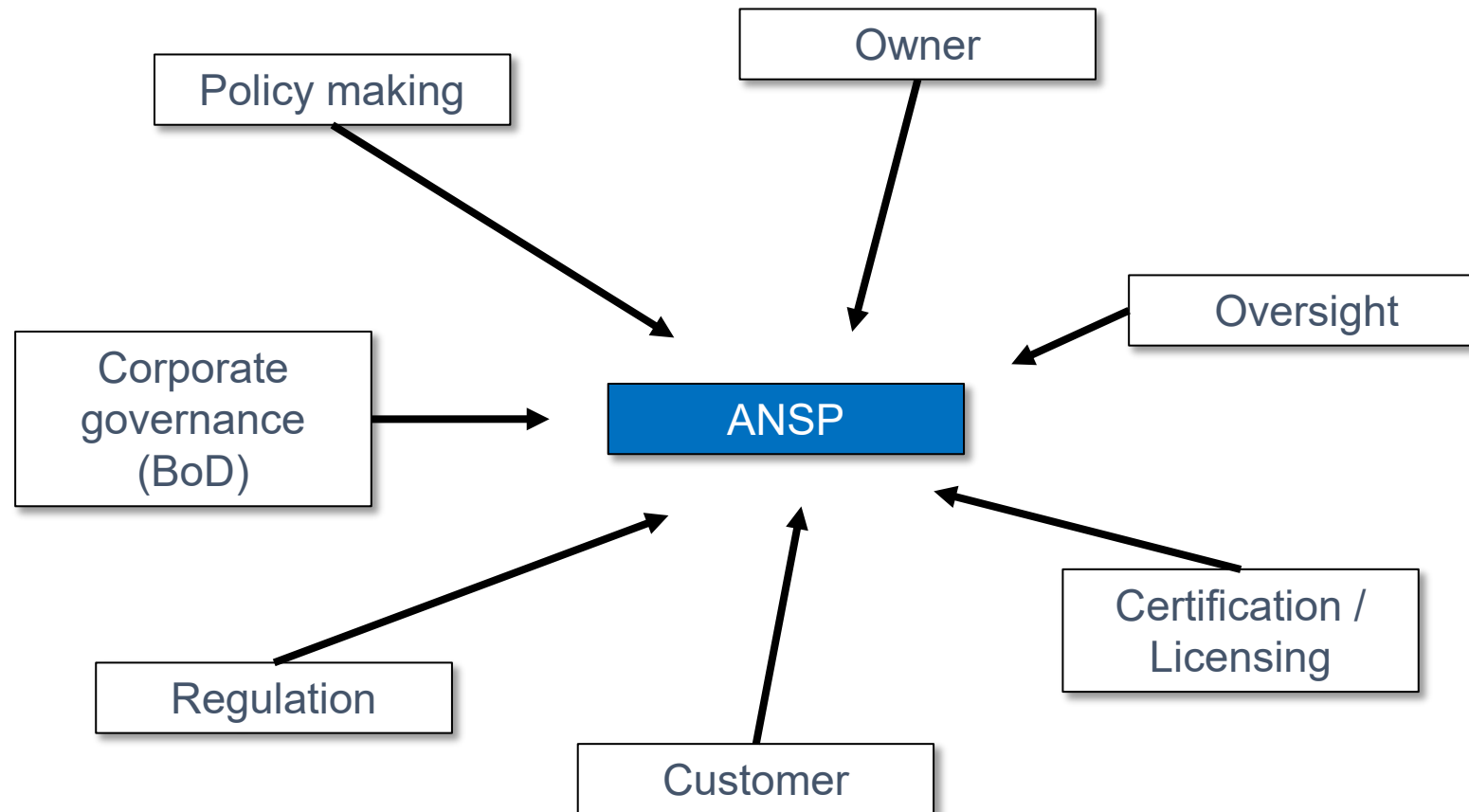


- Financial autonomy
 - Independence from State budget
 - Access to private capital markets
- Management autonomy
 - The concept of strategic objectives
- Business autonomy
 - Who defines the business model?
 - Who defines the business strategy?
 - Definition of the core business / State mandate
 - Room for
 - commercial activities?
 - competition?
 - entrepreneurial freedom?

Governance



The many roles of the State



National

Governmental			Autonomous	
Self regulated	Org. separated	Public corp.	Corporatised	Privatised
FAA → ATO SCTA (France) → DSNA Russia → State Corp		LVNL (NL)	ATNS (South Af.) Skyguide (CH) DFS (Germany) Airservices (Aus) Airways Corp.(NZ)	NavCanada Non share capital company NATS (UK) 51% ENAV (Italy) 47%
China South America	Singapore CAAS			

International

Inter-governmental	Private
MUAC ASECNA COCESNA CE X TS	SERCO Johnson PanAm

Organisational model

Canada

- Autonomous privatised entity
- Tailor designed model
- Robust, mature and proven model
- Robust safeguards against conflicts of interests (e.g. safety/financial performance)

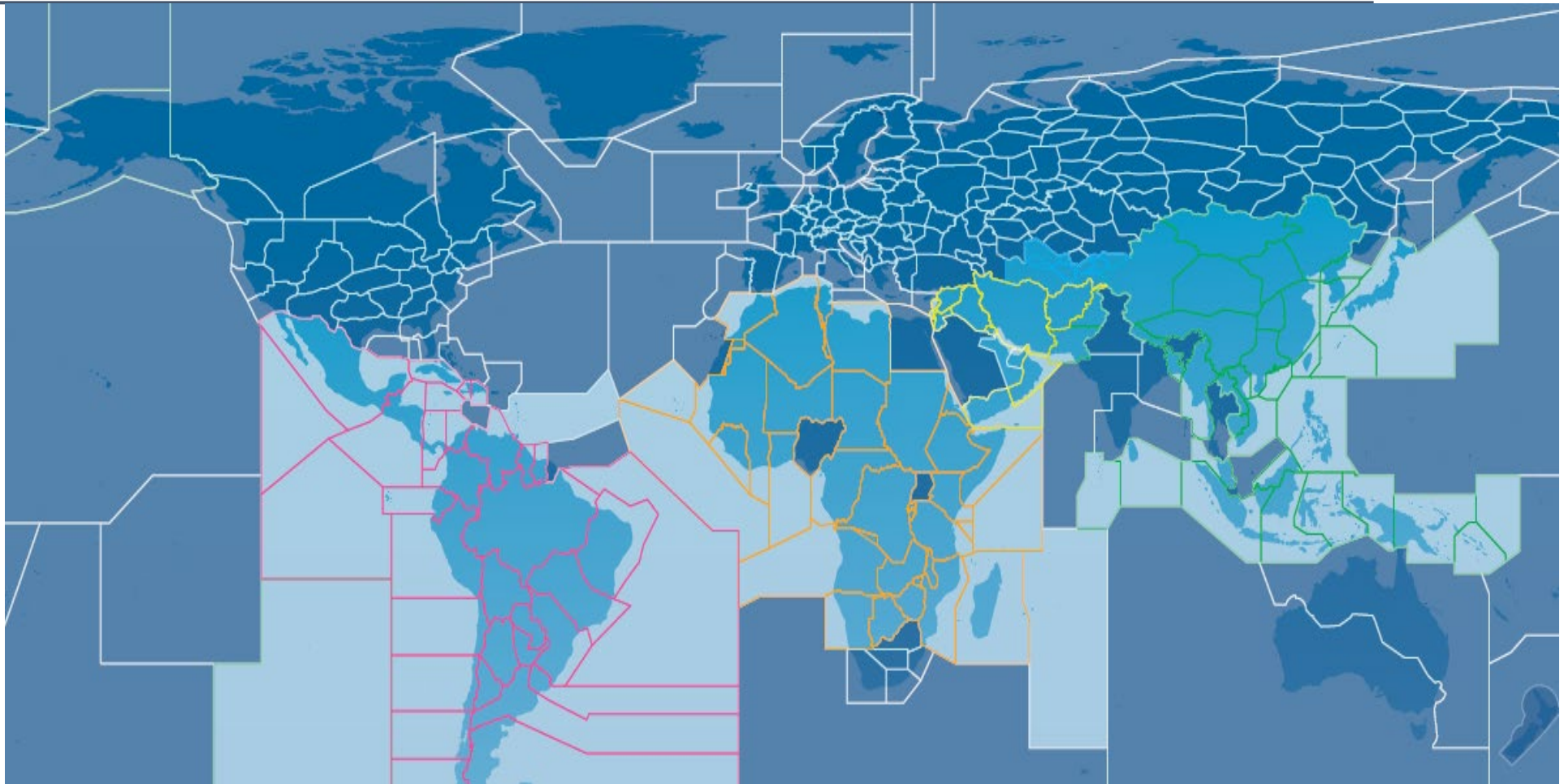
Singapore

- Classical State agency
- Robust internal separation of regulatory and service provision function

Models for the provision of ATS

ICAO (Annex 11) describes 3 models for the provision of ATS:

1. A State provides ATS over its own territory;
2. A State delegates to another State the responsibility to provide ATS over its territory of parts thereof
3. A State accepts the responsibility to provide ATS over parts of the high seas.



Air Traffic Control & National Borders



Geographical Market

Canada

- Core business
 - Large territorial airspace
 - Large oceanic and polar sectors
 - Significant airport market (40+)
- Non-core business
 - Global advanced technology and CNS services supplier

Singapore

- Core business
 - Small domestic airspace
 - Domestic market = mainly airport (global hub status)
 - Large oceanic sectors
 - Significant amount of “delegated airspace”
- Non-core business
 - Global training academy

The ANS market

- Types of competition
 - Competition in the market
 - Competition for the market
 - Competition for geographical market
 - Competition for traffic
 - Unbundling of infrastructures
- Regulated segment
- Unregulated market

Categories of services

Core Air Navigation Services

- Air Traffic Services
- Airspace Management
- Air Traffic Flow Management

Ancillary services

- Aeronautical Information Service
- Instrument Flight Procedure Service
- Data Services (e.g. Flight Data Processing)

Technical Services

- Communication services
- Surveillance services
- Navigation services

Support services

- Training services
- Consulting services

Canada

- Core business
 - ATS provided as a legal monopoly
- Non-core business
 - Provision of CNS services (e.g. ADS-B) on a competitive basis on the global market (AIREON shareholder)
 - Commercial CNS technology sold through commercial subsidiaries (NavcanATM, wholly owned, and Searidge 50% owned by NavCanada, 50% owned by NATS UK)

Singapore

- Core business
 - Legal monopoly for ATS provision
- Non-core business
 - Training services provided on a competitive basis on the global market

The European Performance Plan

KPAs	KPIs	Scope	Target	Financial incentive
Capacity	En route ATFM delay per flight	FABEC	Not yet defined; 0.5 mn at EU level	No
Environment	<ul style="list-style-type: none"> -Average horizontal en route flight efficiency -Effective use of civil / military airspace structures 	EU network	0.75%	No
Cost effectiveness	En route determined unit rate	National	Not yet defined; -3.5% / year at EU level	Yes
Safety	<ul style="list-style-type: none"> - Effectiveness of safety management - Application of the severity classification - Reporting of just culture 	National	No	No

Canada

- Safety: top tier worldwide
- Capacity meets demand
- Good financial performance (international comparison)

Singapore

- Safety: top tier worldwide
- Capacity meets demand
- Good financial performance (international comparison)

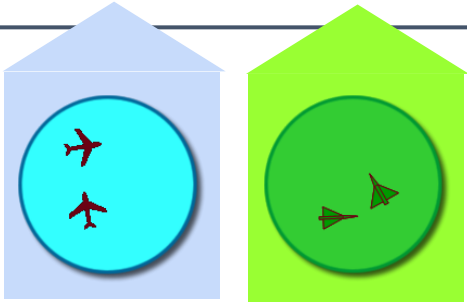
Canada

- Not for profit orientation
- Commercial subsidiaries
- Classical ICAO based user charge

Singapore

- Not for profit orientation
- Classical ICAO based user charge

Segregated systems



2 ATC systems

Poor data exchange and different functions.

MIL ATC unit co-located with Air Defence Unit.

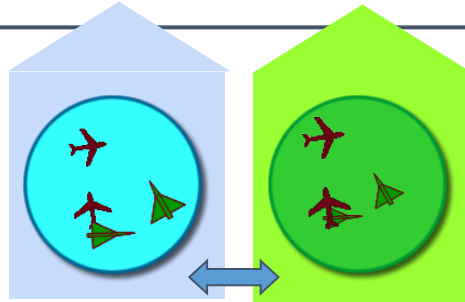
CIV ATC Unit located remotely.

Displayed radar data differs between MIL and CIV units.

No direct communication between MIL and CIV positions.

Coordination ensured through third party.

Integrated system Segregated units



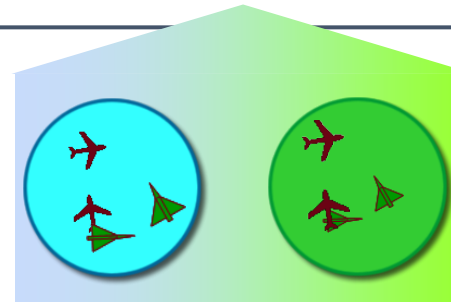
MIL ATC Unit stand alone, located remotely from CIV ATC Unit.

MIL and CIV ATC systems have similar functions.

Good level of data exchange.

Displayed radar data same between MIL and CIV ATC Units

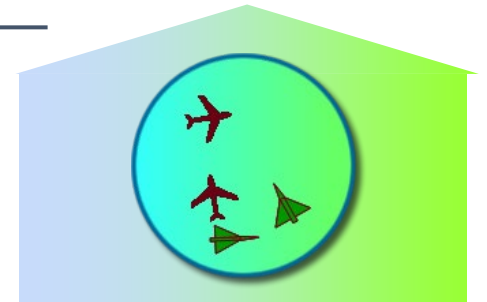
Single ATC system Co-located units



One ATC system

MIL and CIV sectors co-located in same OPS room or same building

Single ATC system Single ATC unit



ATC service to MIL and CIV traffic provided by the same ATC sector



Source EUROCONTROL PRR 8

Civil-military interface

Canada

- Segregated system
- Large sovereign airspace reduces impact of airspace segregation

Singapore

- Segregated system
- Small sovereign airspace requires thorough and intensive coordination

Challenges

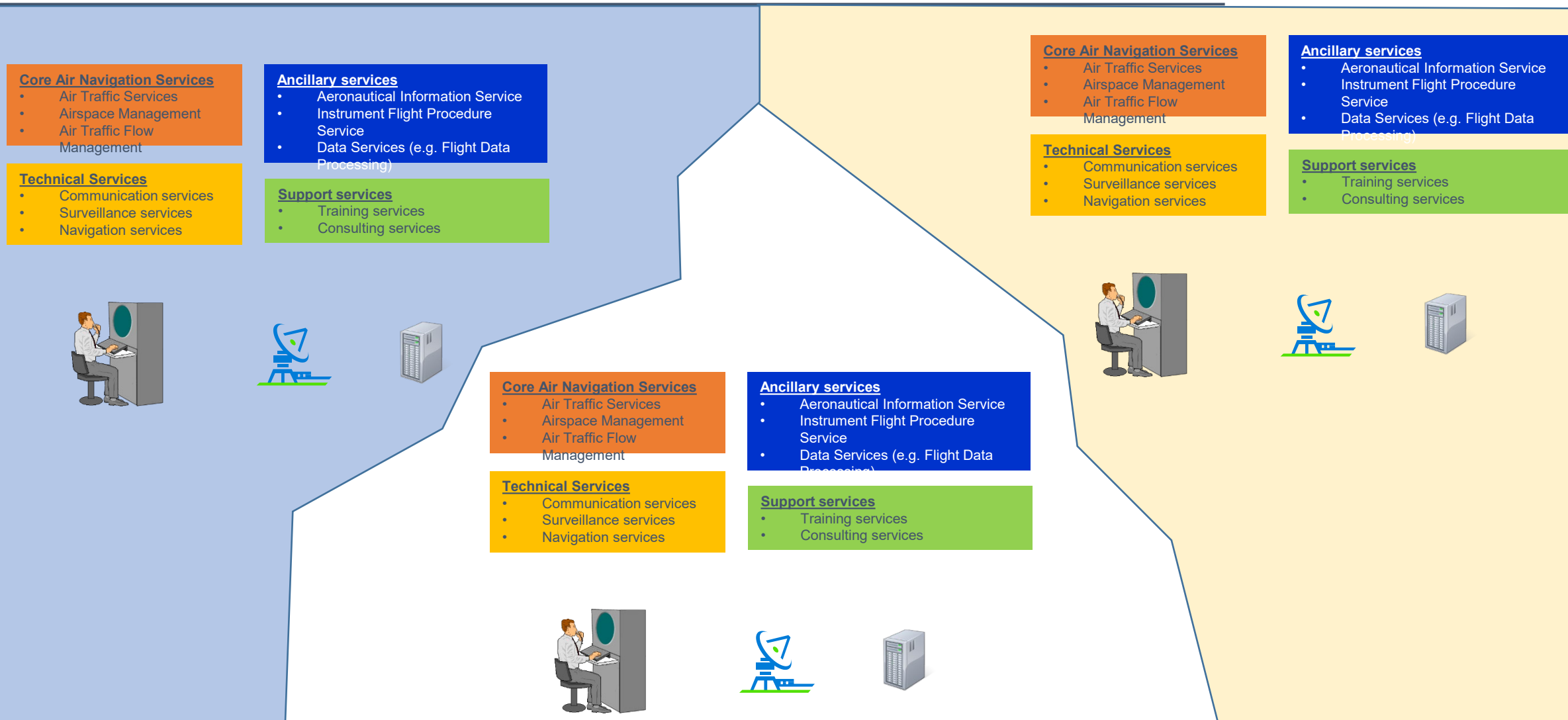
Canada

- Maintain domestic customer's satisfaction
- Maintain “captive” customers and capitalise on new routes (transpolar, ultra-long range, etc.)
- Develop territorial ANS coverage
- Improve performance thanks to virtualisation and automation
- Increasing environmental pressure

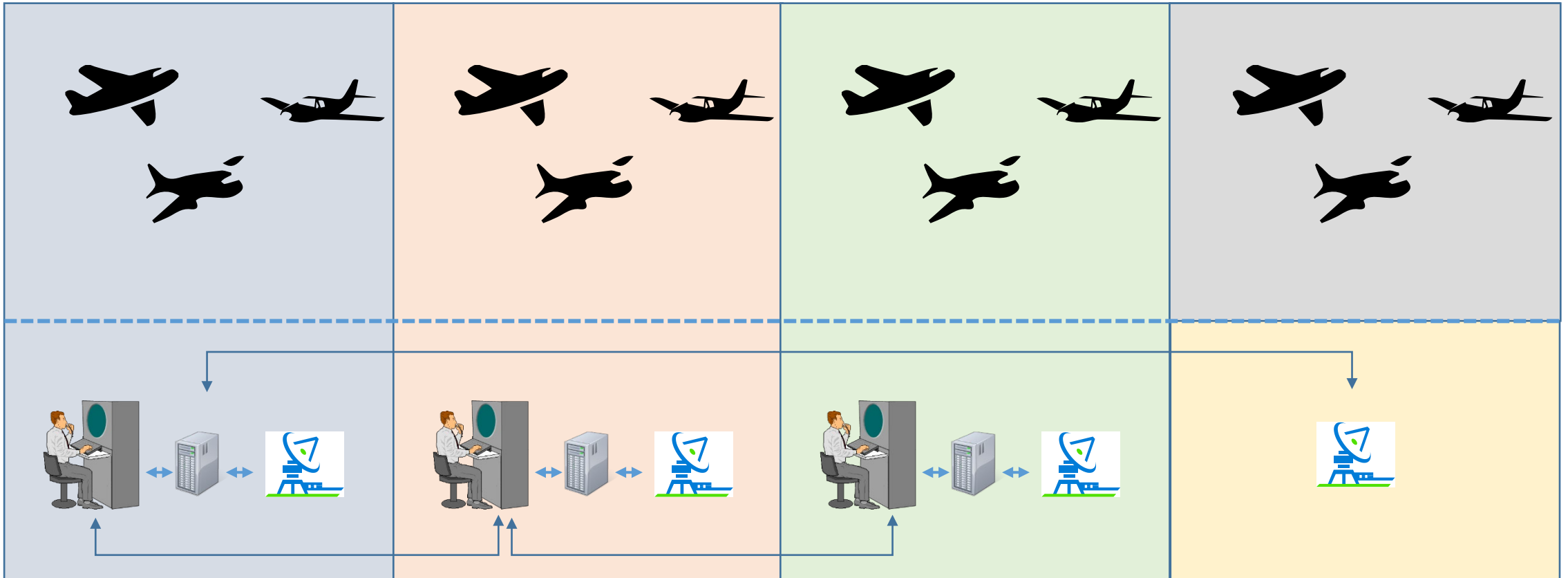
Singapore

- Small sovereign airspace induces dependence on availability of foreign “delegated airspace”
- Maintain regional leader position as other players strengthen their own
- Maintain capacity in the context of growing traffic demand

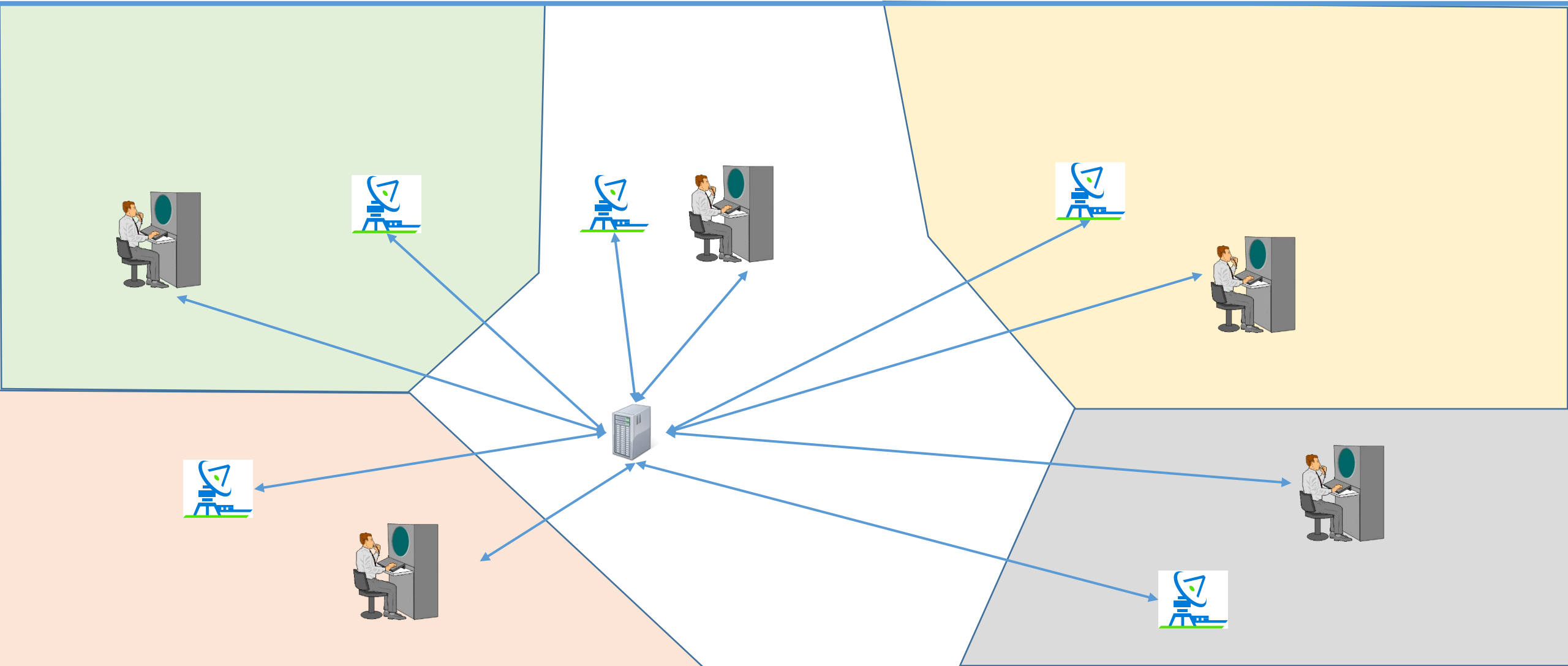
Historical ANS Business Model



Location independence



Virtual Centre Model



Strengths / Opportunities

Canada

- Among the most mature ANS system in the world
- Global leader
- Regional monopoly (huge locked geographical market)
- Most advanced technology
- Technology innovator
- Active global and regional player

Singapore

- Among the most mature ANS system in the world
- Global and regional leader
- Most advanced technology (with Australia and NZ)
- Technology innovator
- Active global and regional player