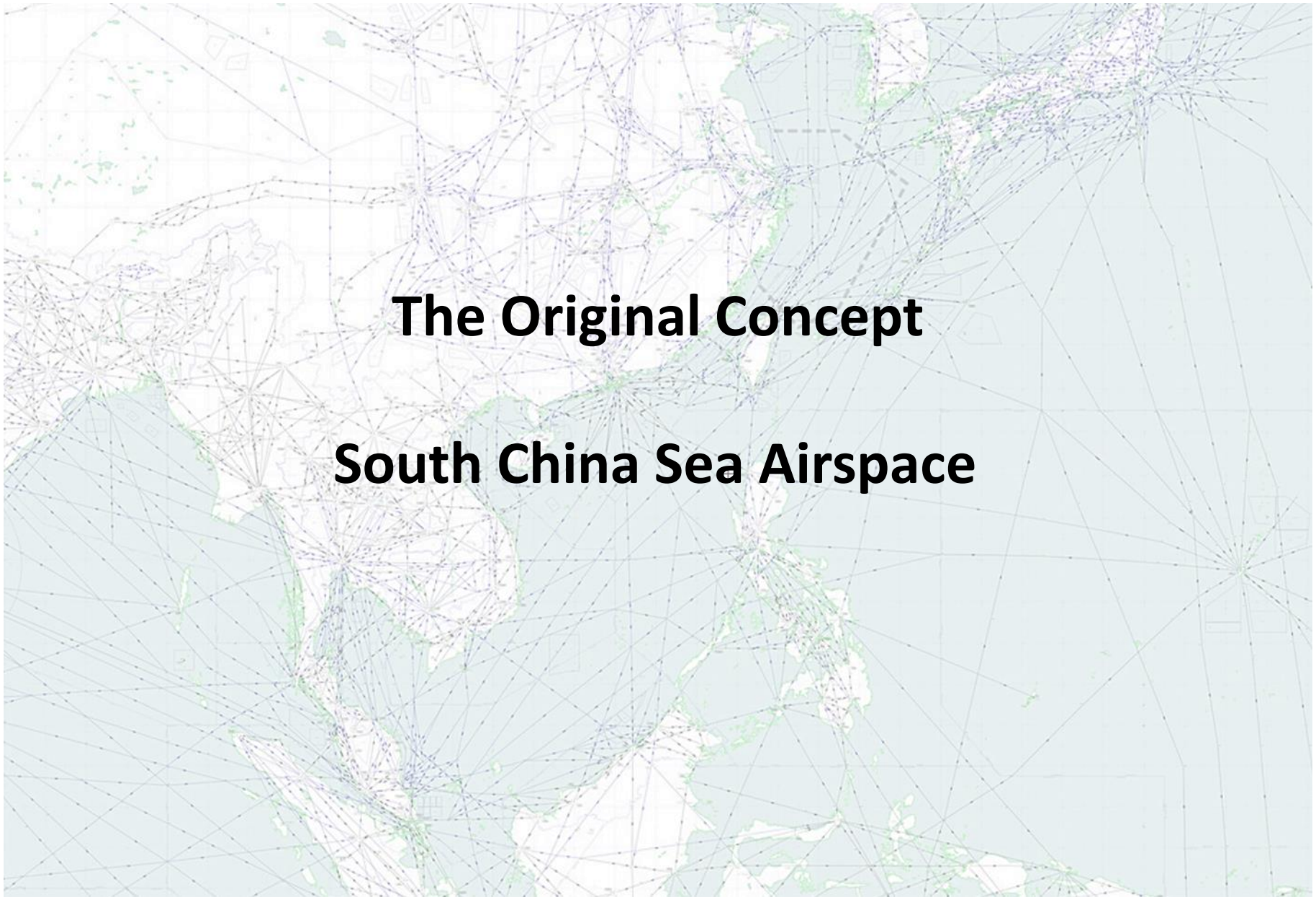
SCSTFRG/11 MEETING 3-6 July 2023

IFATCA

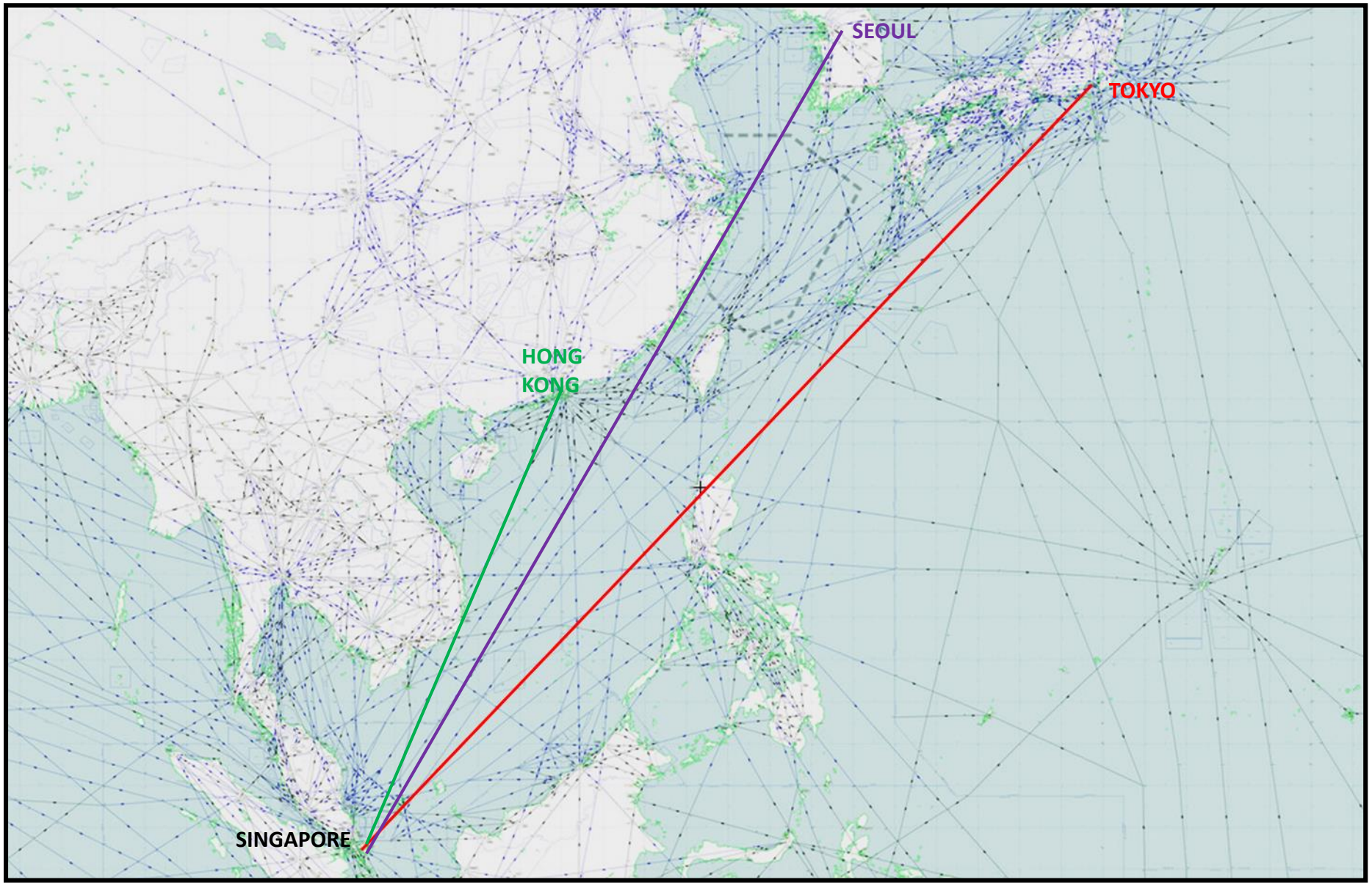
CONCEPT REVIEW OF SOUTH CHINA SEA AIRSPACE



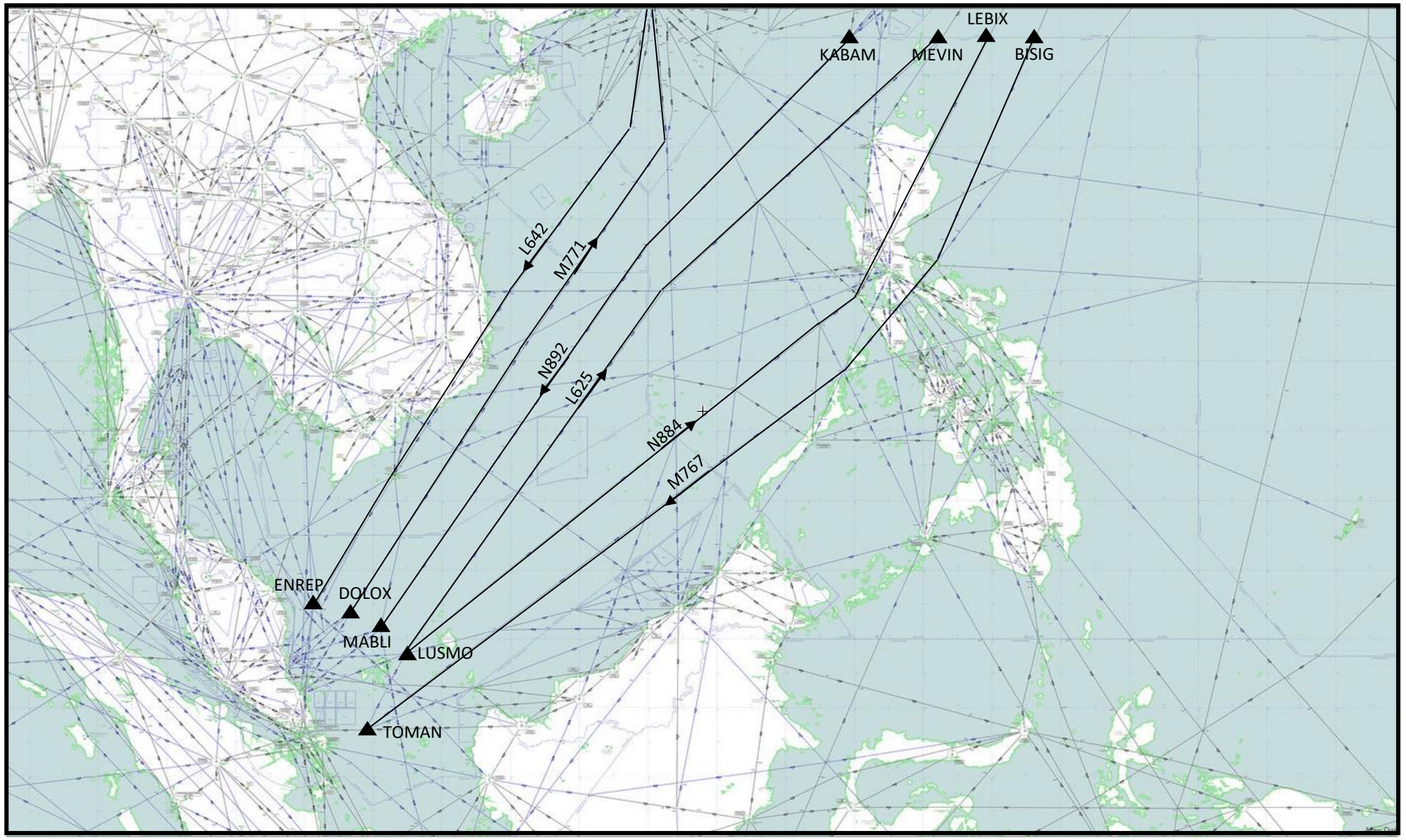
The Original Concept

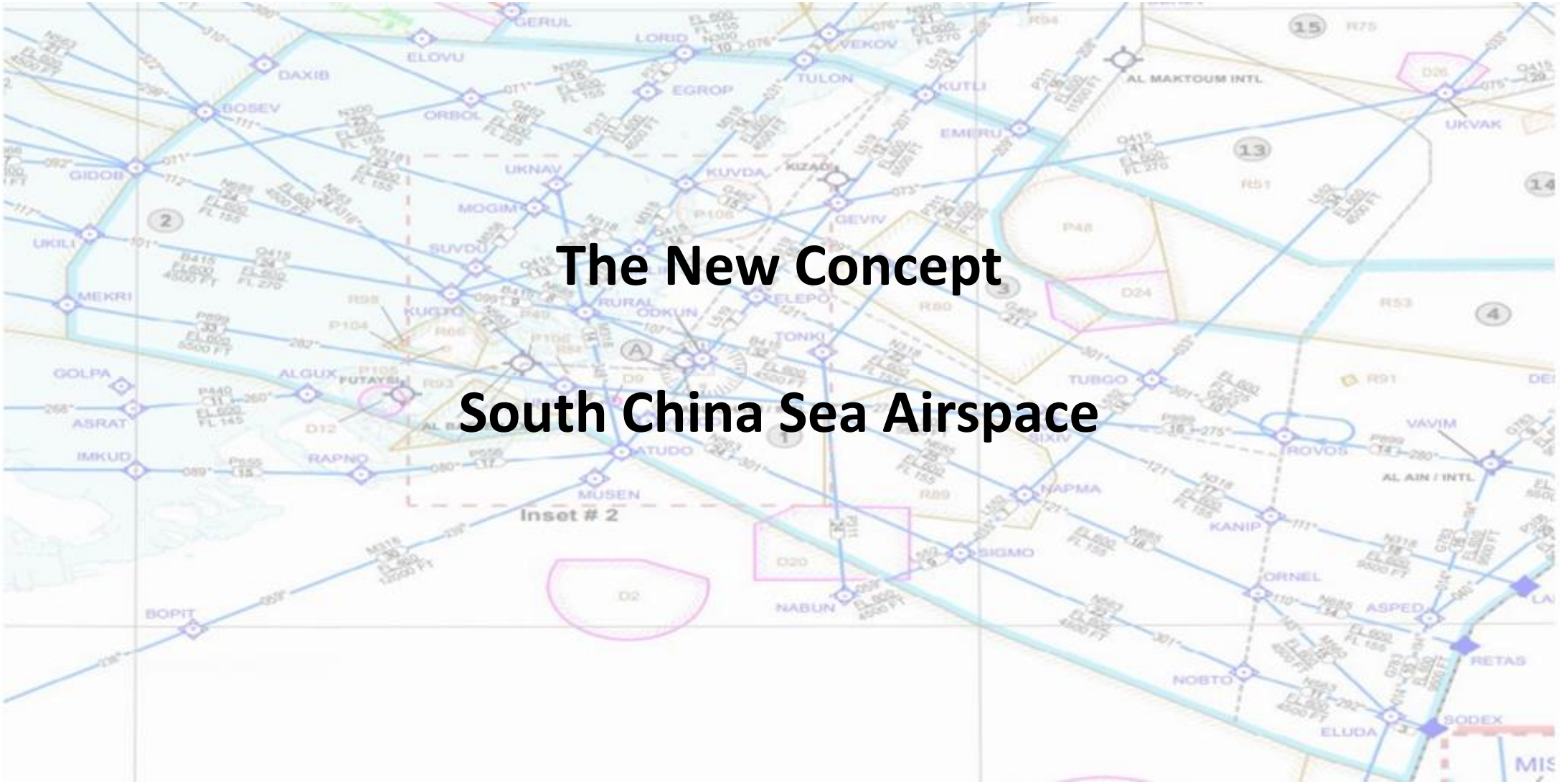
South China Sea Airspace

2001 Concept of Three South China Sea Primary Routes

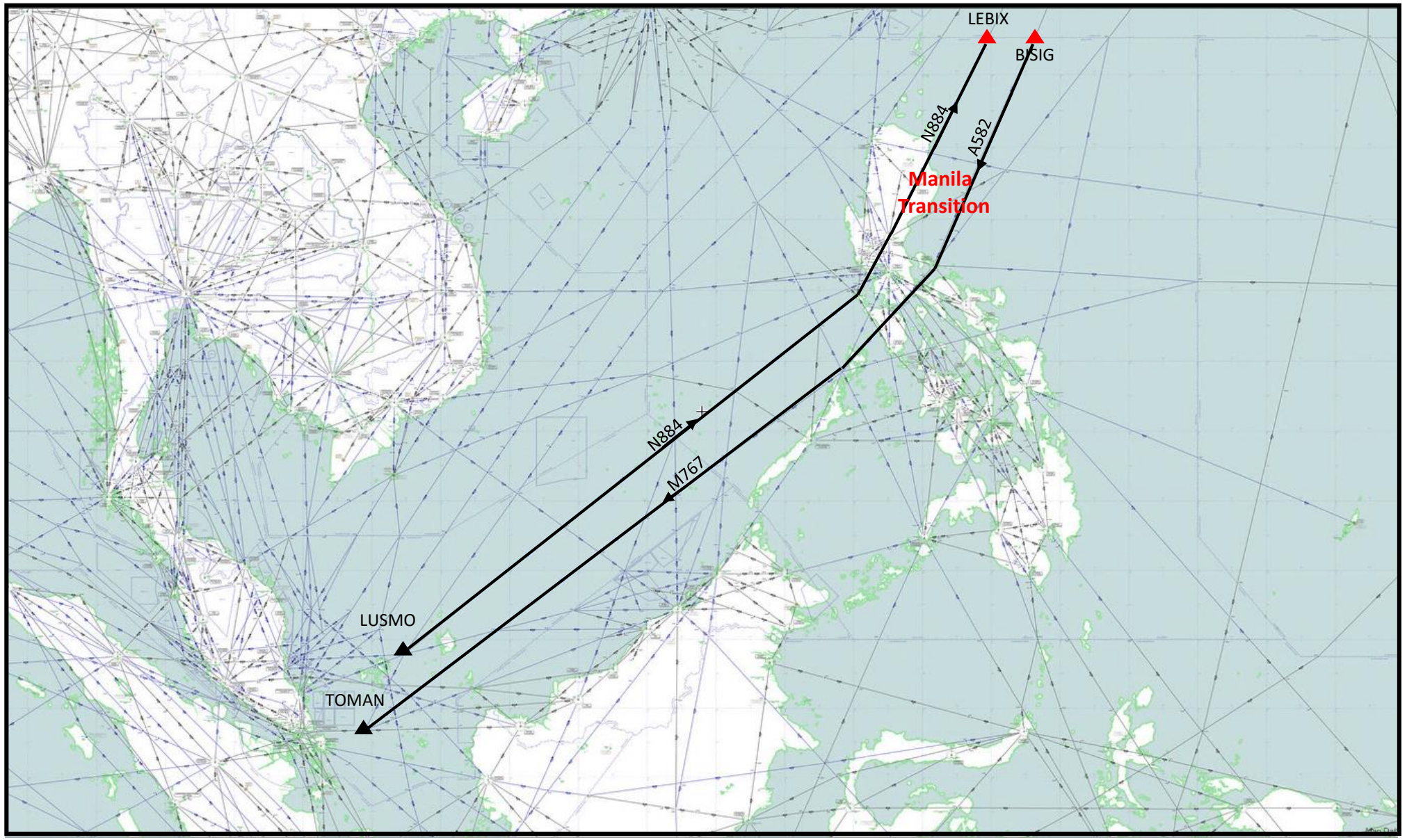


2002 South China Sea Three Primary Parallel RNAV10 Routes

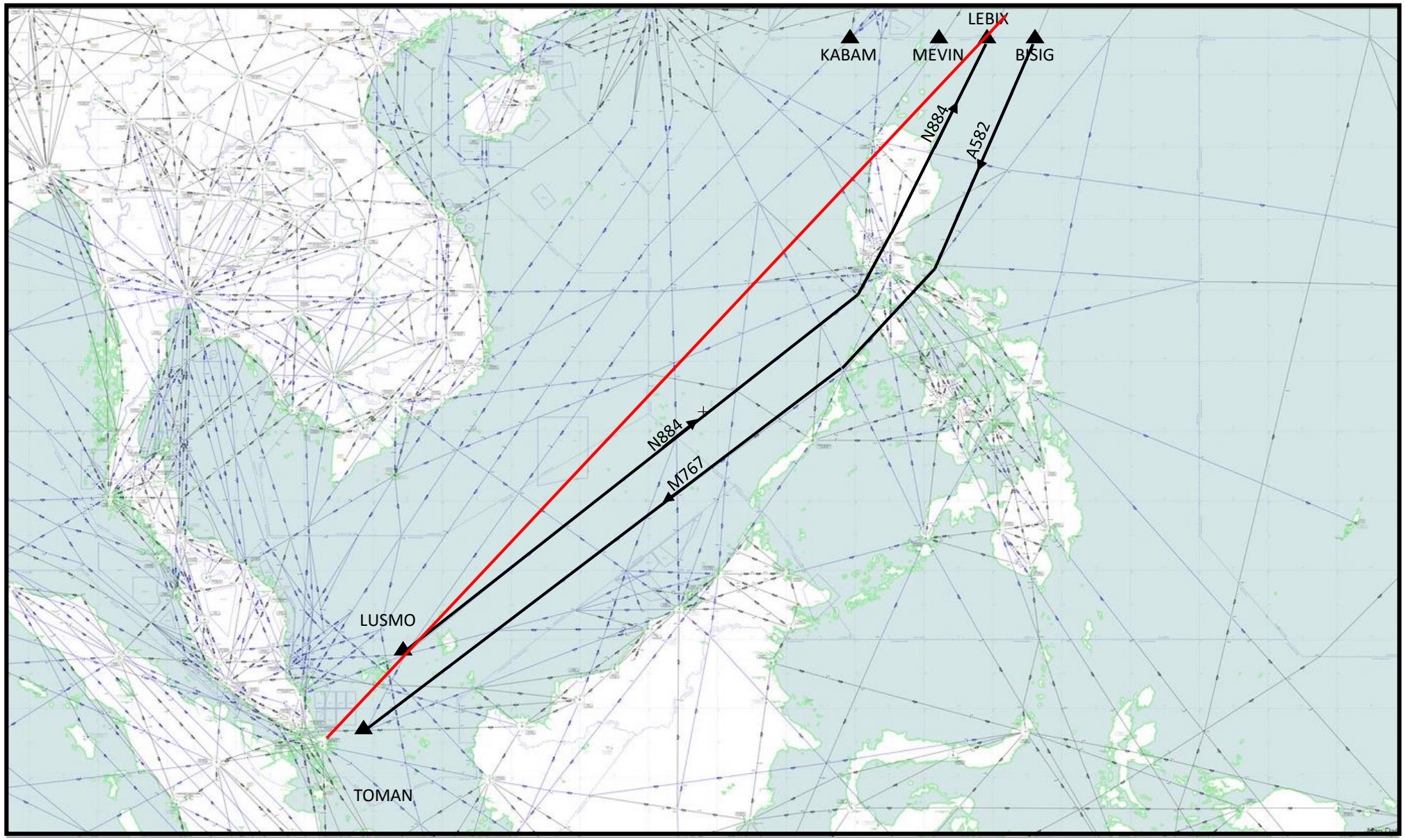



The New Concept
South China Sea Airspace

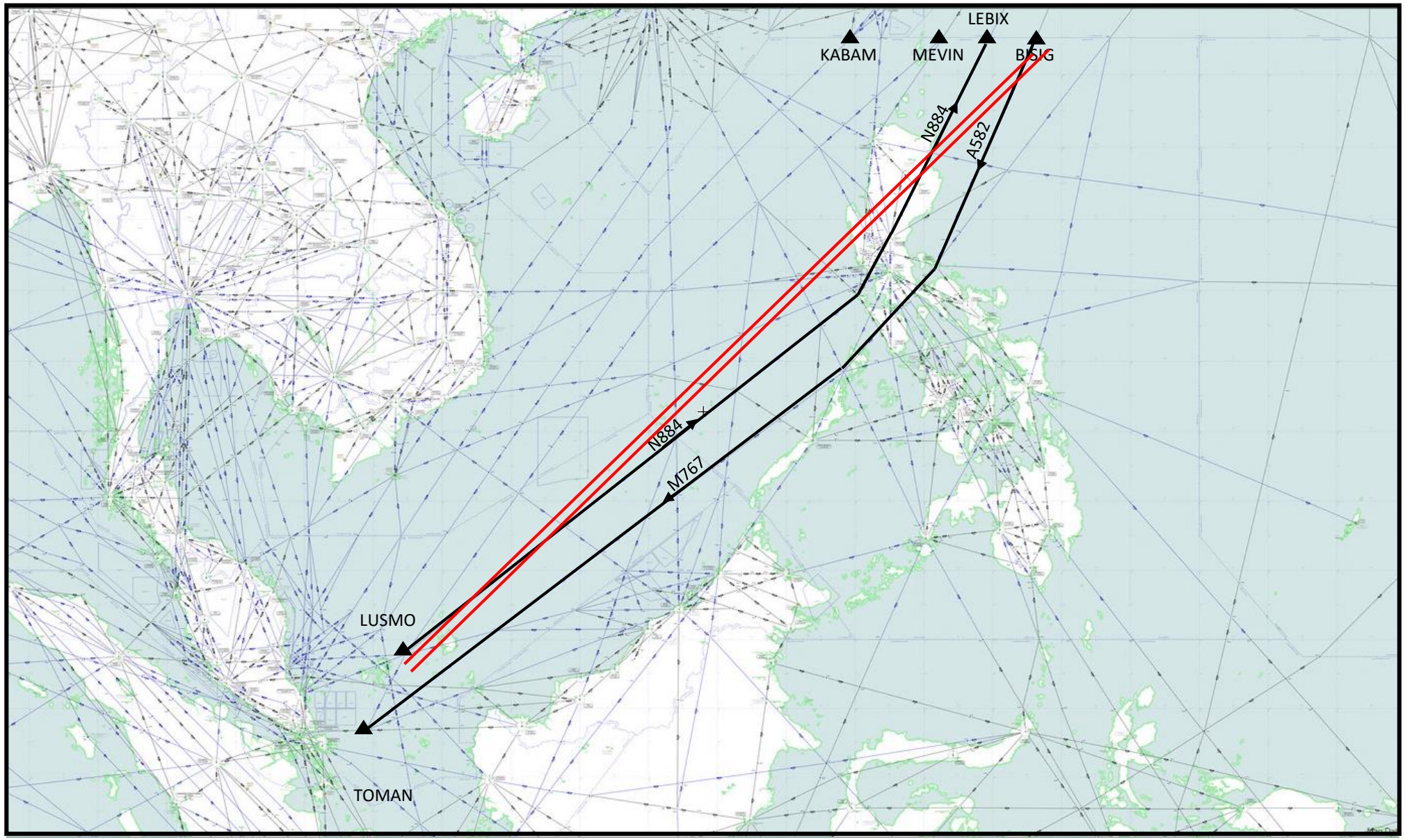
2022 Primary Parallel RNP4 Route Tokyo-Singapore



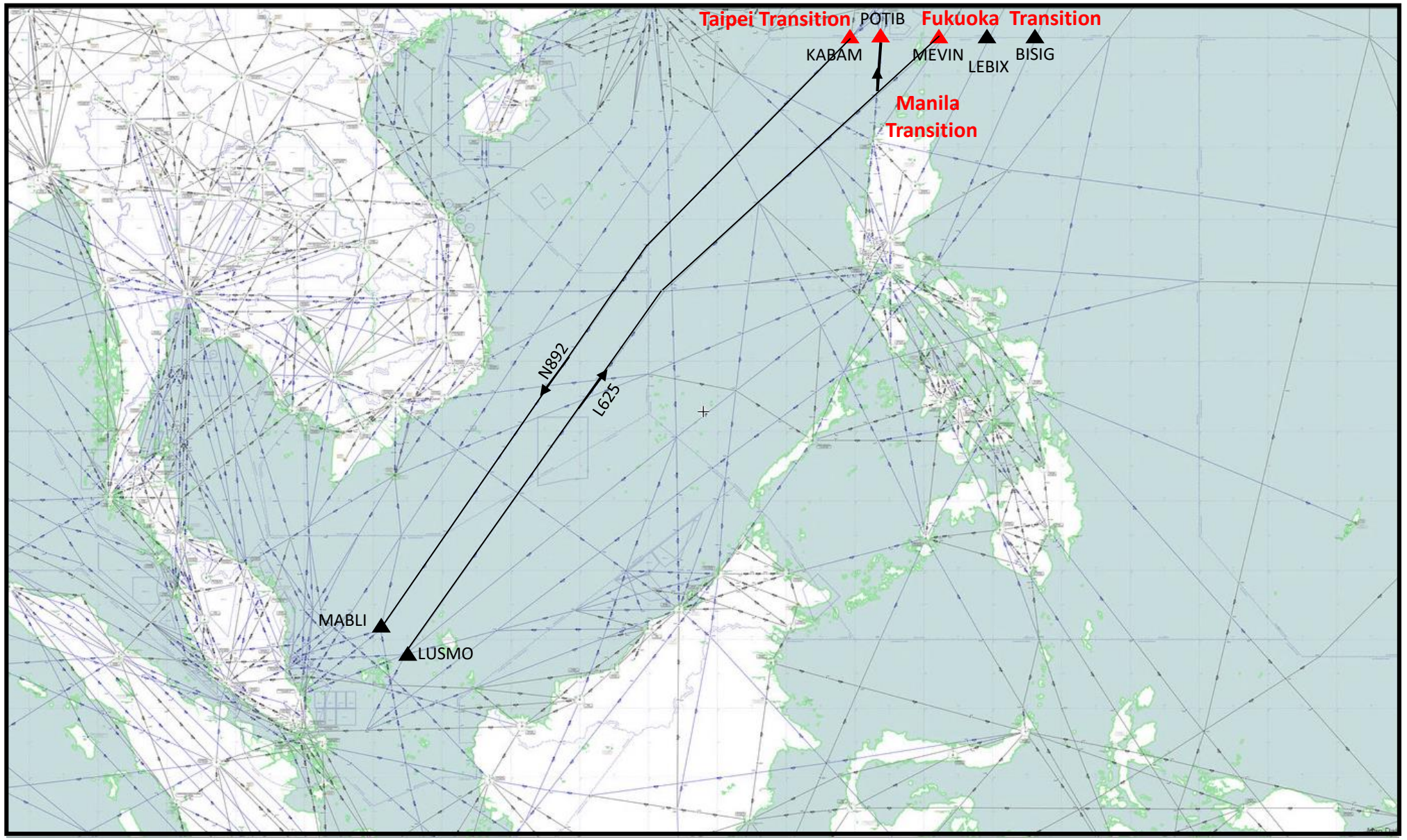
2023 Primary Parallel RNP4 Routes and Direct Track



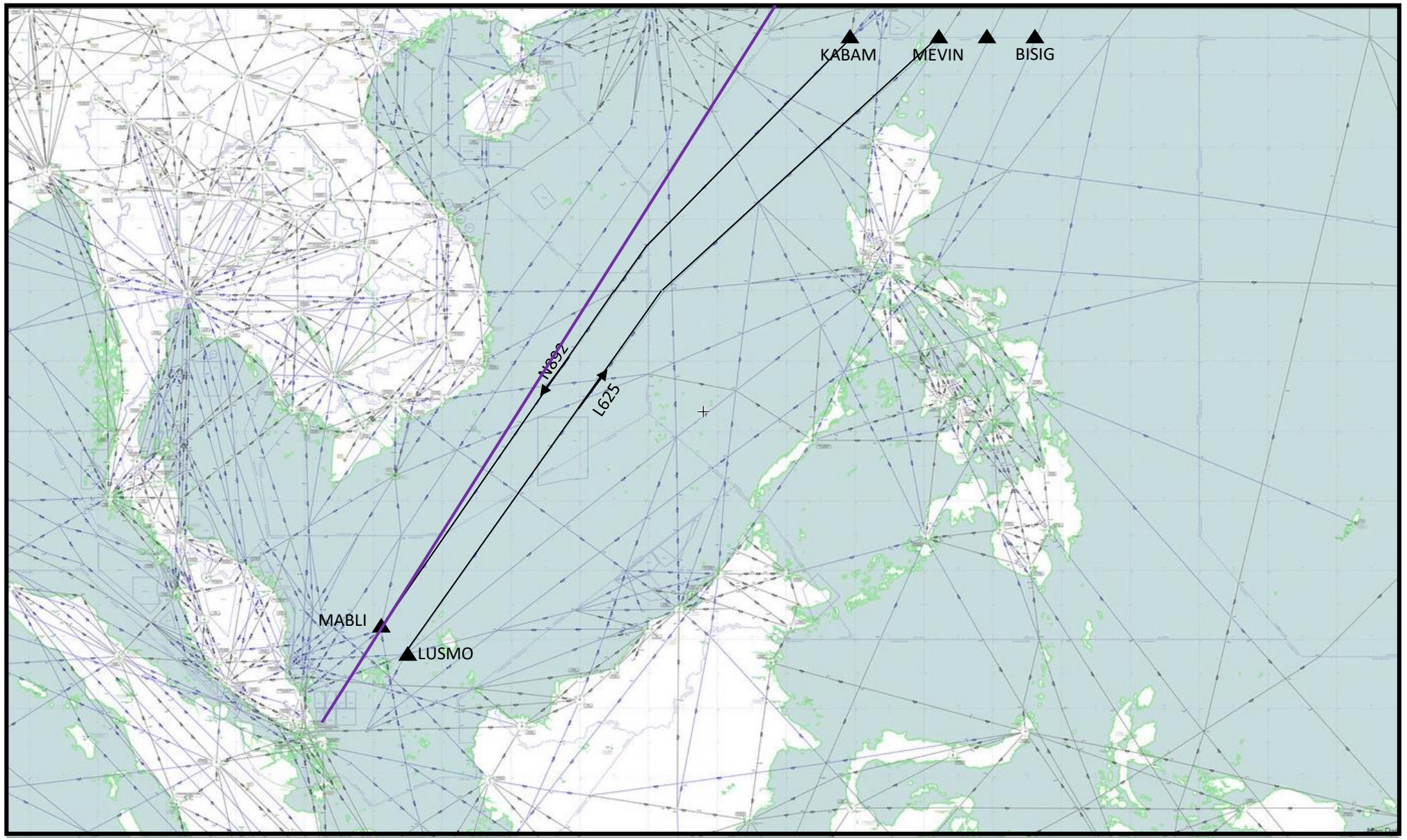
Phase 1 Parallel RNP2 Routes



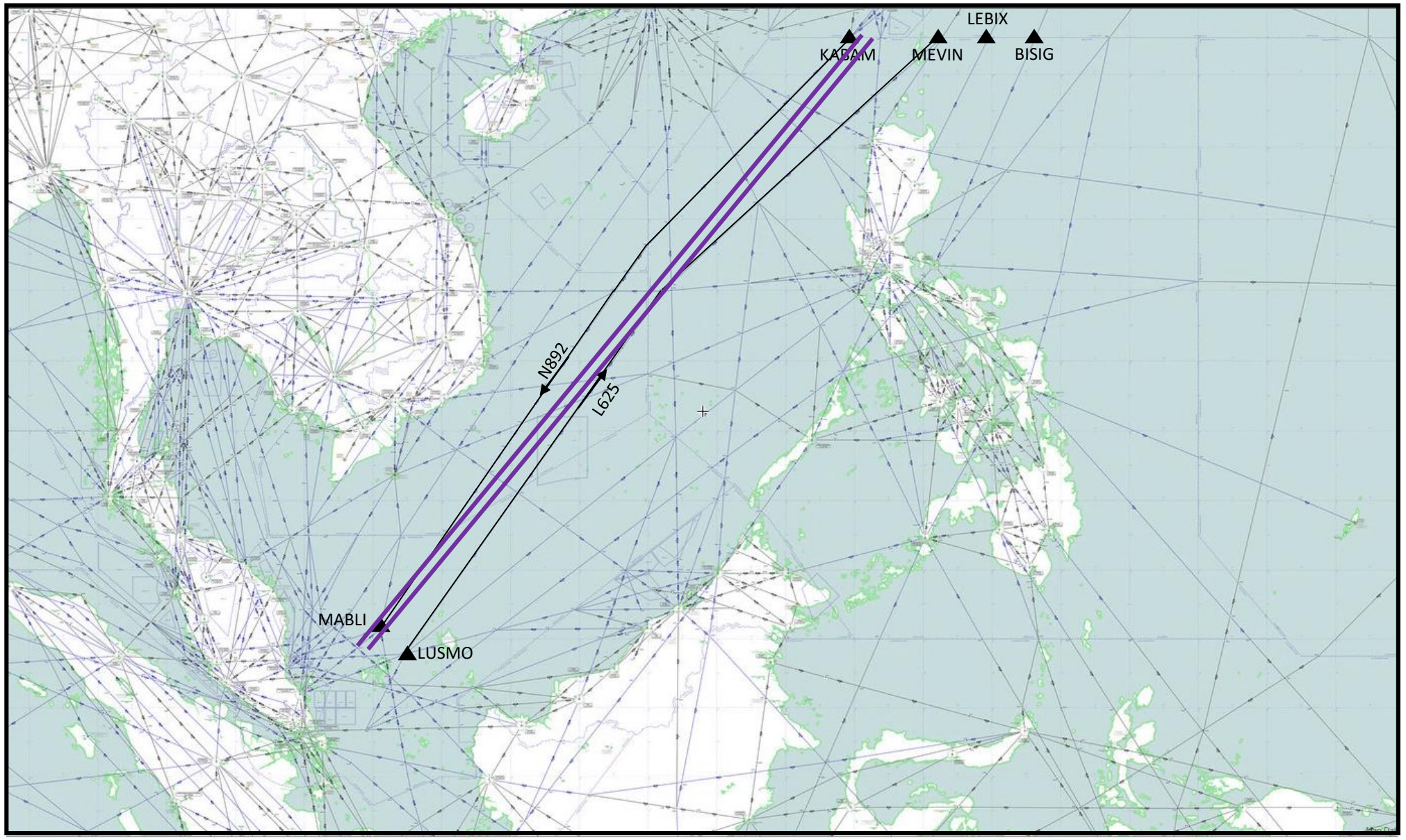
2022 Primary Parallel RNP10 Routes Seoul-Singapore



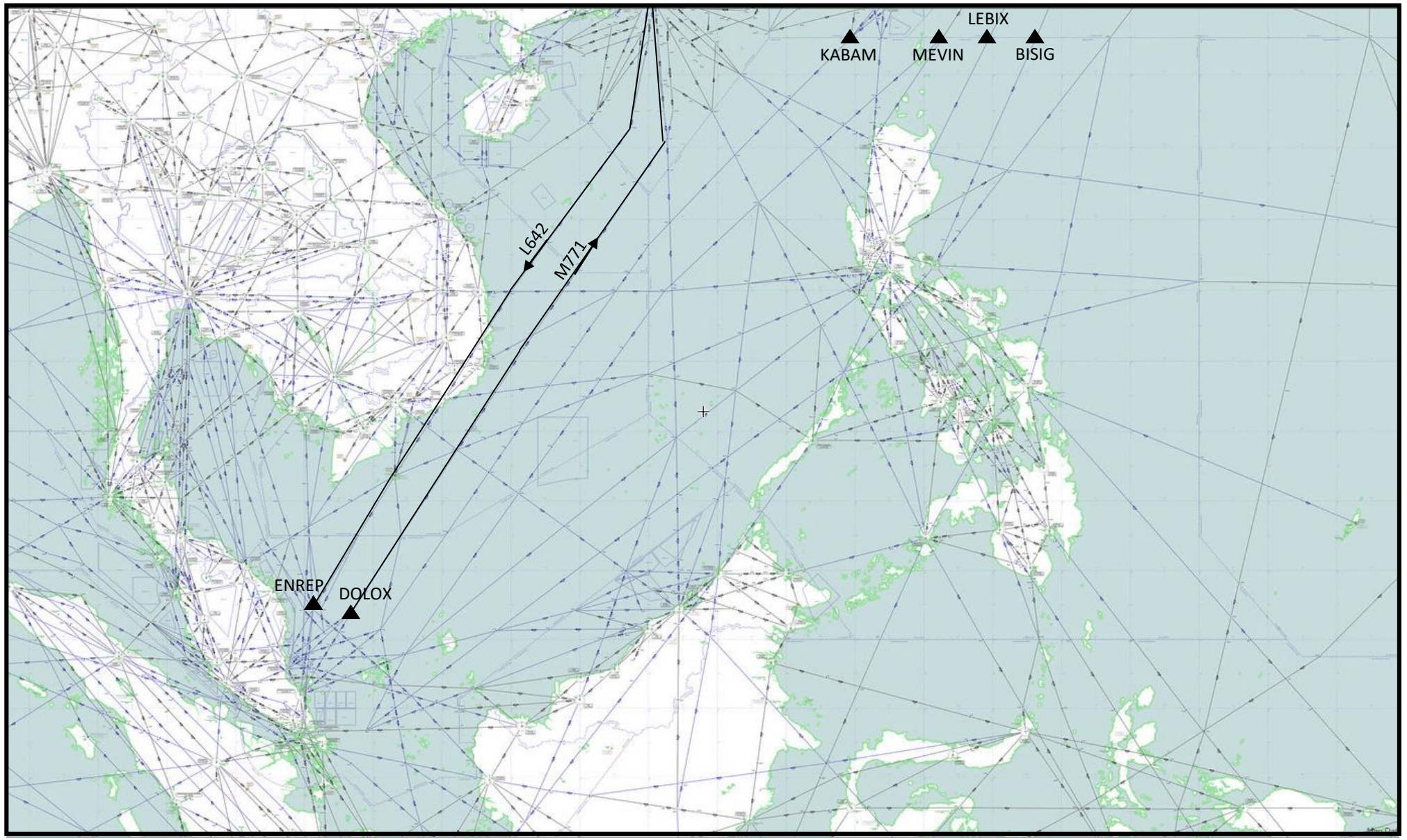
2023 SCS Primary Parallel RNP10 Routes and Direct Track



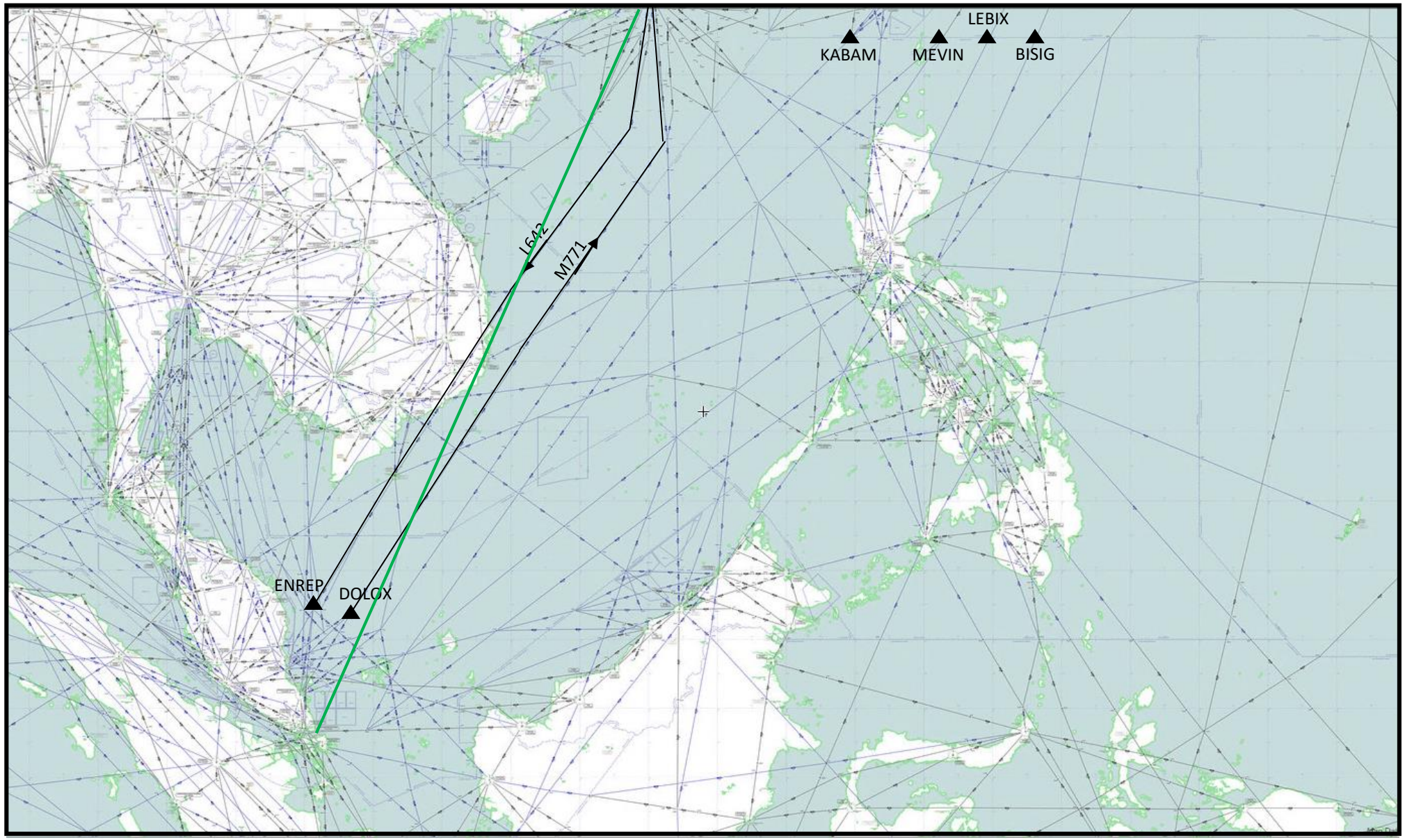
Phase 2 Parallel RNP2 Routes



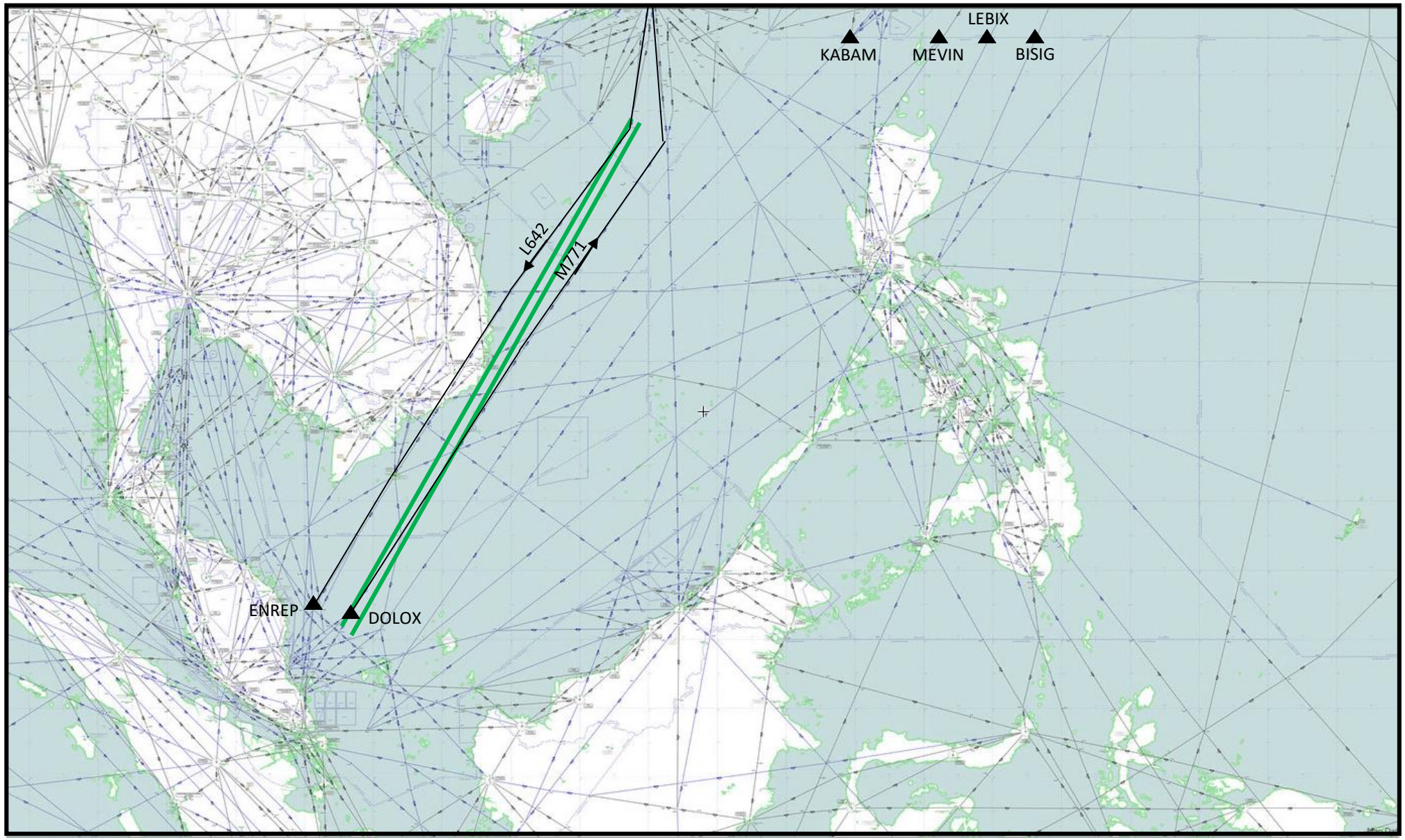
2023 Primary Parallel RNP4 Routes Hong Kong-Singapore



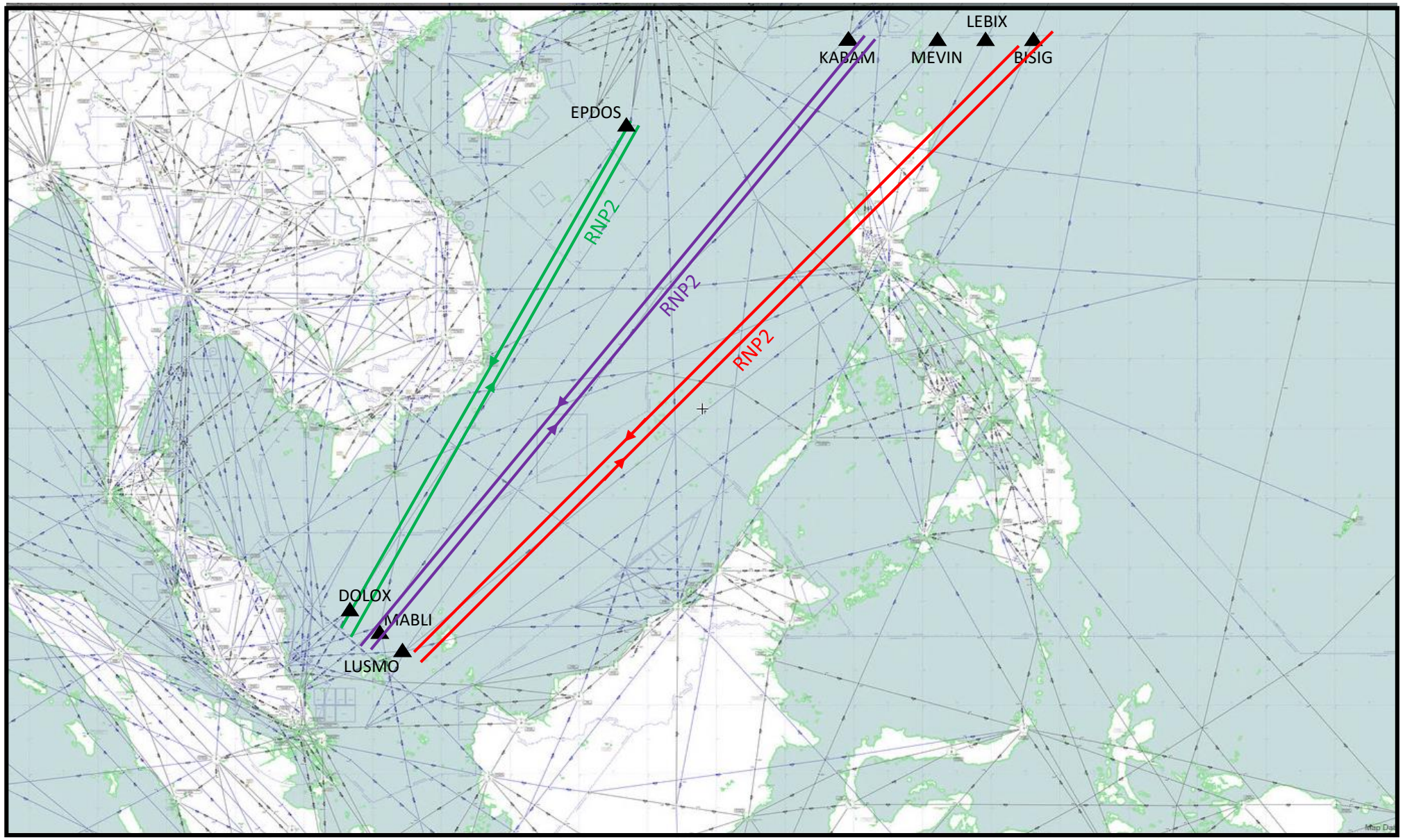
2023 Primary Parallel Routes and Direct Track



Phase 3 Parallel RNP2 Routes Hong Kong-Singapore



Phase 3 South China Sea Parallel RNP2 Routes



FLOS and FLAS

ICAO Annex 2 Appendix 3a Table of Cruising Levels

STANDARD SINGLE ALTERNATE FLIGHT LEVEL SYSTEM		NON-STANDARD SOUTH CHINA SEA FLIGHT LEVEL ORIENTATION SYSTEM
WESTBOUND	EASTBOUND	WESTBOUND/EASTBOUND
	FL410	
FL400		FL400
	FL390	FL390
FL380		
	FL370	
FL360		FL360
	FL350	FL350
FL340		
	FL330	
FL320		FL320
	FL310	FL310
FL300		
	FL290	
FL280		

STANDARD SOUTH CHINA SEA FLIGHT LEVEL ORIENTATION SYSTEM

WESTBOUND	EASTBOUND
	FL410
FL400	
	FL390
FL360	
	FL350
FL320	
	FL310

STANDARD SINGLE ALTERNATE FLIGHT LEVEL SYSTEM

WESTBOUND	EASTBOUND
	FL410
FL400	
	FL390
FL380	
	FL370
FL360	
	FL350
FL340	
	FL330
FL320	
	FL310
FL300	
	FL290
FL280	

The Future

ATM Automation Systems Seminar

Basics of TBO

TBO is about predicting **where** a flight will be and **at what time**

- This forms the basis for a 'strategic plan'

A trajectory is used as a **reference** for the flight and shared between systems and stakeholders

A trajectory is defined in four dimensions

- Latitude, Longitude, Altitude, and **Time**

The trajectory is **updated** as operations evolve over time and new information becomes available

TBO is a NOT an **individual** system

TBO is a **collection** of systems, capabilities, processes, and people working together to achieve operational objectives

Although COTS solution exists to implement elements of TBO, there are currently **no COTS solutions** to implement TBO as a whole

Continuing Journey

2019 — 2020 — 2021 — 2022 — 2023

FF-ICE/R1 & Initial FF-ICE/R2 Live-Flight Demonstration

- SWIM-based FF-ICE/R1 & initial FF-ICE/R2 message exchange (FIXM v4.2)
- Capability to support regional requirements
  - Asia/Pacific FIXM v4.2 Extension
- Integration between ATFM, AMAN, A-CDM, and FF-ICE
- Trajectory evaluation
  - Digital NOTAM in AIXM v5.1
  - MET constraint in IWXXM v3.0
  - Flow constraint in FLXM v2.0a

02

Introduction to FF-ICE

What is FF-ICE?

- Flight and Flow Information for a Collaborative Environment (FF-ICE) facilitates sharing of 4D flight trajectory information among all stakeholders to collaboratively establish a preferred flight trajectory between all parties

- FF-ICE will modernise the present day ICAO flight plan (FPL 2012) and flight planning process to enable the realisation of the ICAO Global ATM Operational Concept (GATMOC) vision and an essential enabler to support Trajectory Based Operations (TBO)

Vision Statement

To achieve an interoperable global air traffic management system, for all users during all phases of flight, that meets agreed levels of safety, provides for optimum economic operations, is environmentally sustainable and meets national security requirements

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Long Term Benefits FF-ICE?

- Enhanced flight planning and ATM with FF-ICE

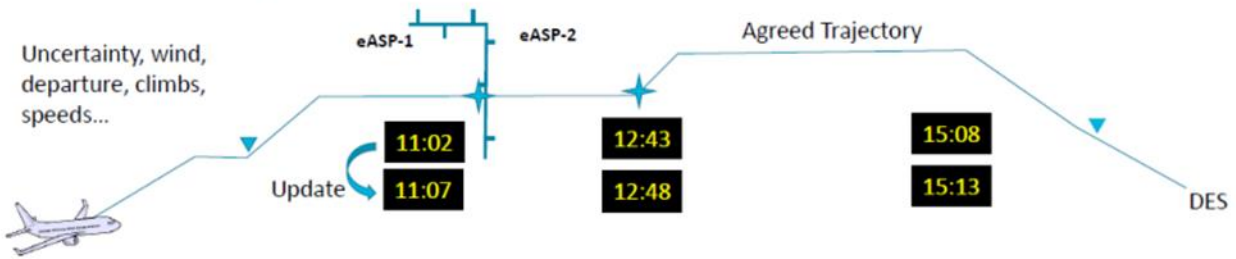
  Increased predictability and accuracy of flight trajectories and pilot's intent. This will allow ATC to manage flights in advance to better utilise airspace and airport resources

  Enables collaboration between ATM service providers and airspace users (through negotiations) to adjust and agree on final flight trajectory throughout entire phase of flight to better cater to ATM needs and user's preference. Harmonised way of issuance of time and/or altitude crossing restrictions to standardise air traffic flow management measures (demand/capacity balancing function)

- Fundamental building block for future ATM

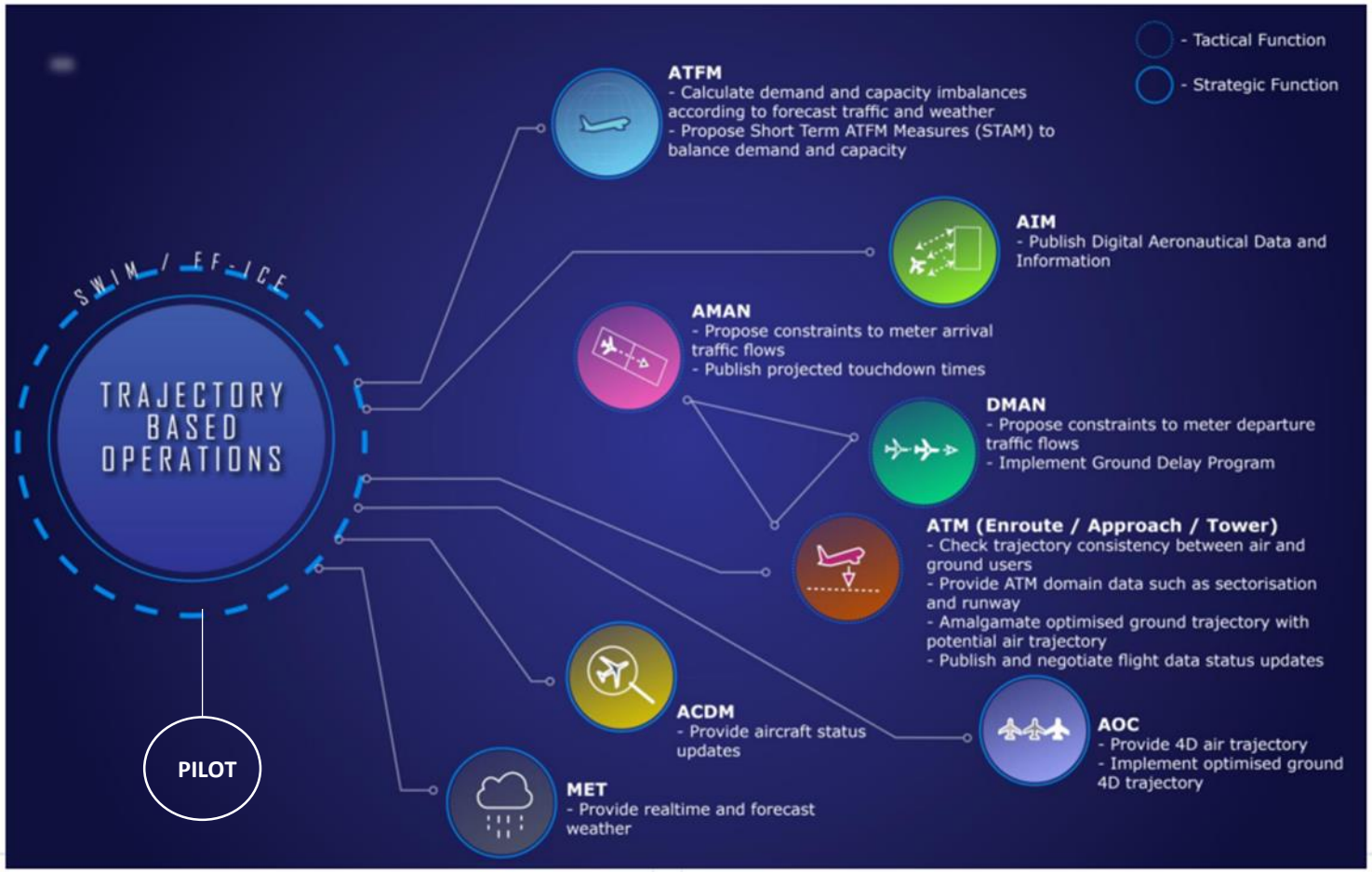
  Future releases of FF-ICE will enable trajectory negotiation between ground and air nodes (while in flight) for more refined ATM – beyond DCB, FF-ICE can support even conflict management (CM) and traffic synchronisation (TS) to enhance safety and optimise airspace and airport capacity

Implementing FF-ICE/R1 is first step to developing enhanced flight planning processes focused on pre-flight phase. It is also a fundamental building block for longer term vision of TBO. These are not solely FF-ICE benefits but could also be shared benefits of the other TBO building blocks.

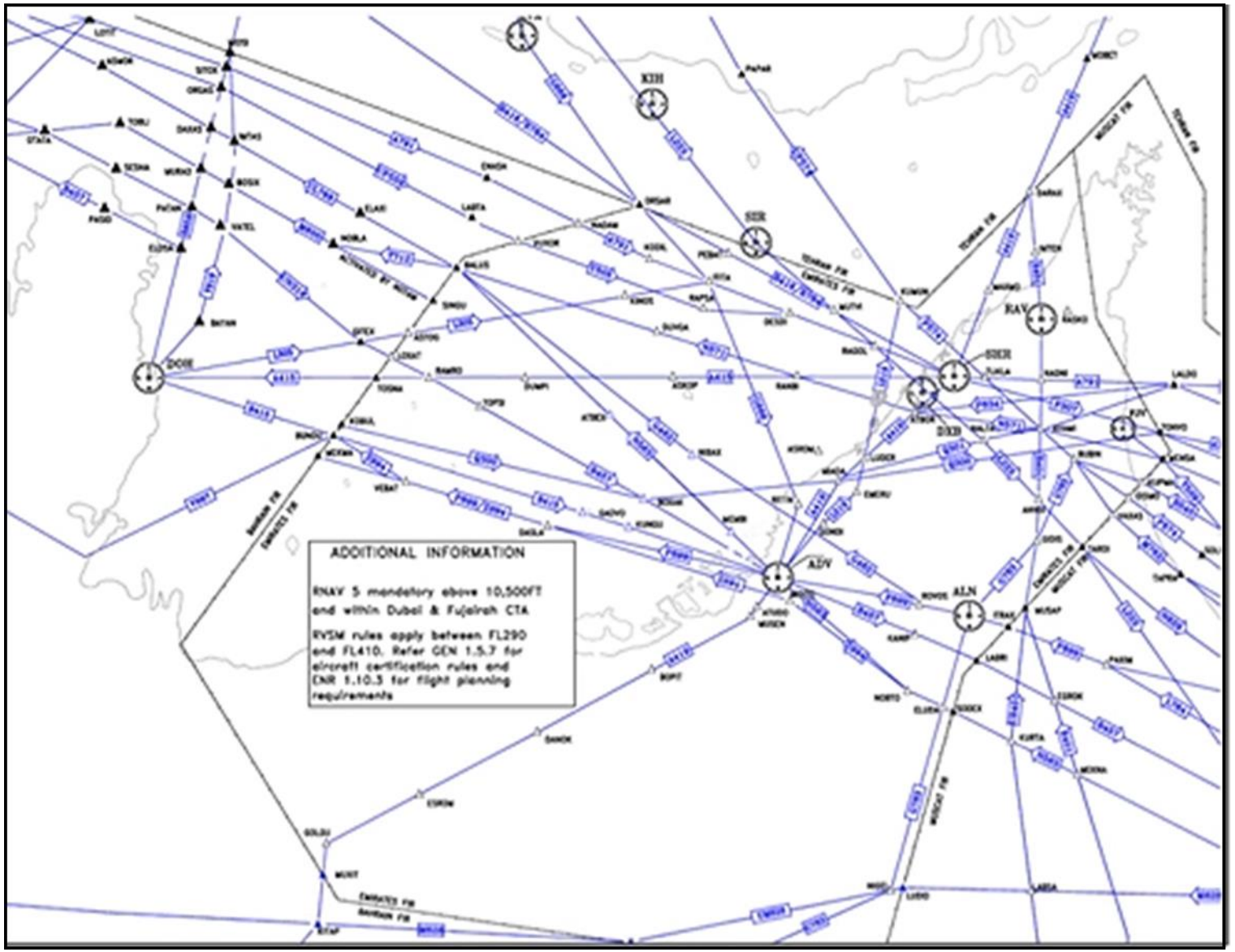


ICAO

7. Thales AMS moving towards Seamless ATM and 4-D TBO



2020 Arabian Gulf Airspace Structure



3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper; and

b) discuss any relevant matters as appropriate.