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# Meeting for the Establishment of the APIRG Information and Infrastructure Sub Group (APIRG IIM/SG)

Dakar, Senegal 28-30 November 2016

**Aviation System Block Upgrades (ASBU) Methodology**

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## ASBU framework

- **What is ASBU framework?** Today's Challenges, Tomorrow's Needs, Why ASBU methodology and ASBU explanation



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## Today's Challenges



- **Air traffic growth expands two-fold every**
  - **15 years**
- **Growth can be a double-edged sword.**
  - **Challenge is how to achieve both safety and operational improvements**
- **The 37<sup>th</sup> session of ICAO General Assembly advised to redouble efforts with focus on ensuring interoperability of systems while at the same time maintaining or enhancing aviation safety.**



## New National/Regional Plans - interoperability challenges



**Many Regional and National ATM modernization programmes are being developed worldwide**

- They are following ICAO's Global Air Navigation Plan and Operational Concept, but nevertheless they are different in their own way
- thus resulting in interoperability challenges



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## Tomorrow's Needs

- **Global framework is needed to ensure that Safety is maintained and enhanced**
  - ATM improvement programs are harmonized
  - Barriers to future efficiency and environmental gains are removed, at reasonable cost





# Harmonize the Global Agenda

- Initial NextGen/SESAR Symposium (2008)
- Convened Standards Organization Roundtable (2009)
- Established working agreements with Standards Organizations on shared work programmes (2010)



## What is the Basis for Block Upgrades?

- Foundation of blocks originates from existing, near term implementation plans and extracted from (examples):



- Aligned with ICAO ATM Operational Concept
- Block upgrades will allow structured approach to meet regional and local needs, while considering associated business cases
- They reflect recognition that all modules are **not** required in **all** airspaces



## What is the difference between Past/current and ASBU methodology?

- **Past/current methodology**
  - Scope covers only **ground equipment for ANSPs**
  - Planning based on **short and medium term**
  - Implementation process is through GPIs
- **ASBU methodology**
  - Scope extends to **airspace users and regulators**
  - Planning based on **short, medium and long terms**
  - Implementation process is through **Blocks** and **corresponding modules**





## What are the advantages of ASBU methodology?

- Takes into account **all related issues** such as **air/ground Systems**, **air/ground procedures**, **air/ground regulatory requirements** and **business case formulation**
- One stop planning at the same time flexible and scalable
- Modules provide a series of **measurable, operational performance improvements**, which could be introduced as needed

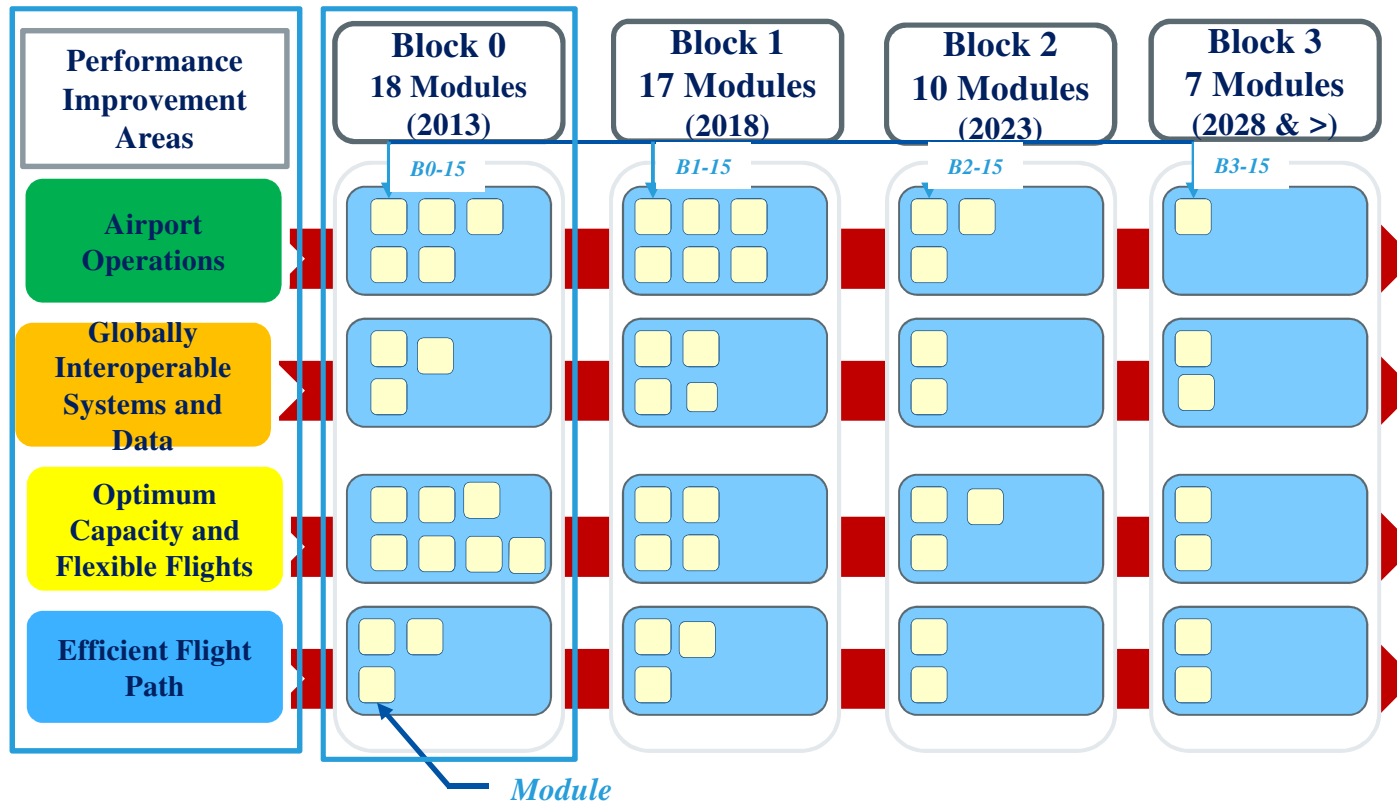


# Aviation System Block Upgrades – Definition

- What is an ‘**Aviation System Block Upgrade**’ (ASBU)?
- Each Module is defined as follows:
  - **Intended *Operational Improvement/Metric* to determine success**
  - **Necessary *Procedures*/Air and Ground**
  - **Necessary *Technology*/Air and Ground**
  - **Positive *Business Case* per Upgrade**
  - ***Regulatory Approval Plan*/Air and Ground**
  - ***Well understood* by a **Global Demonstration Trial****
    - All synchronized to allow initial implementation
    - Won’t matter *when or where* implemented

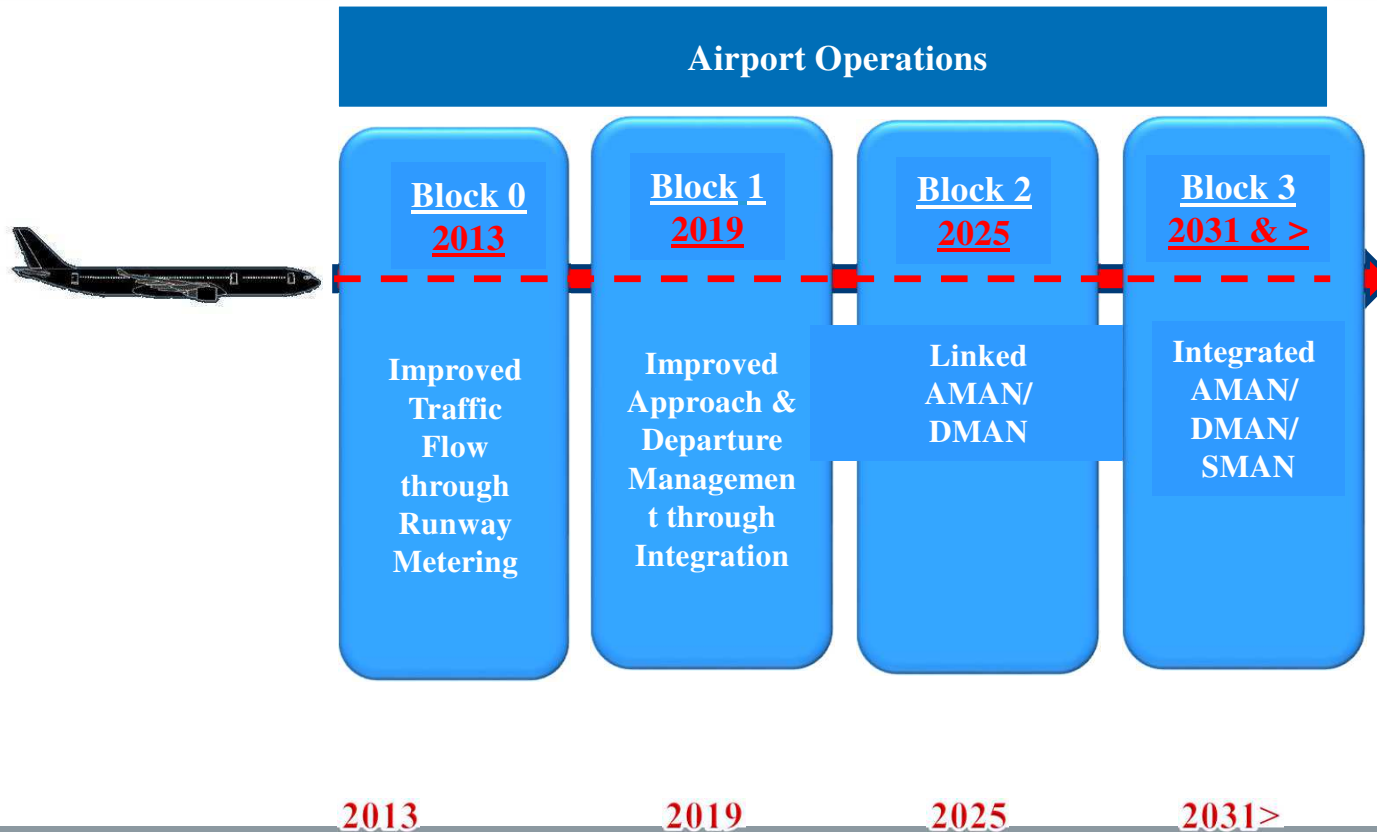


# Understanding the Relationships





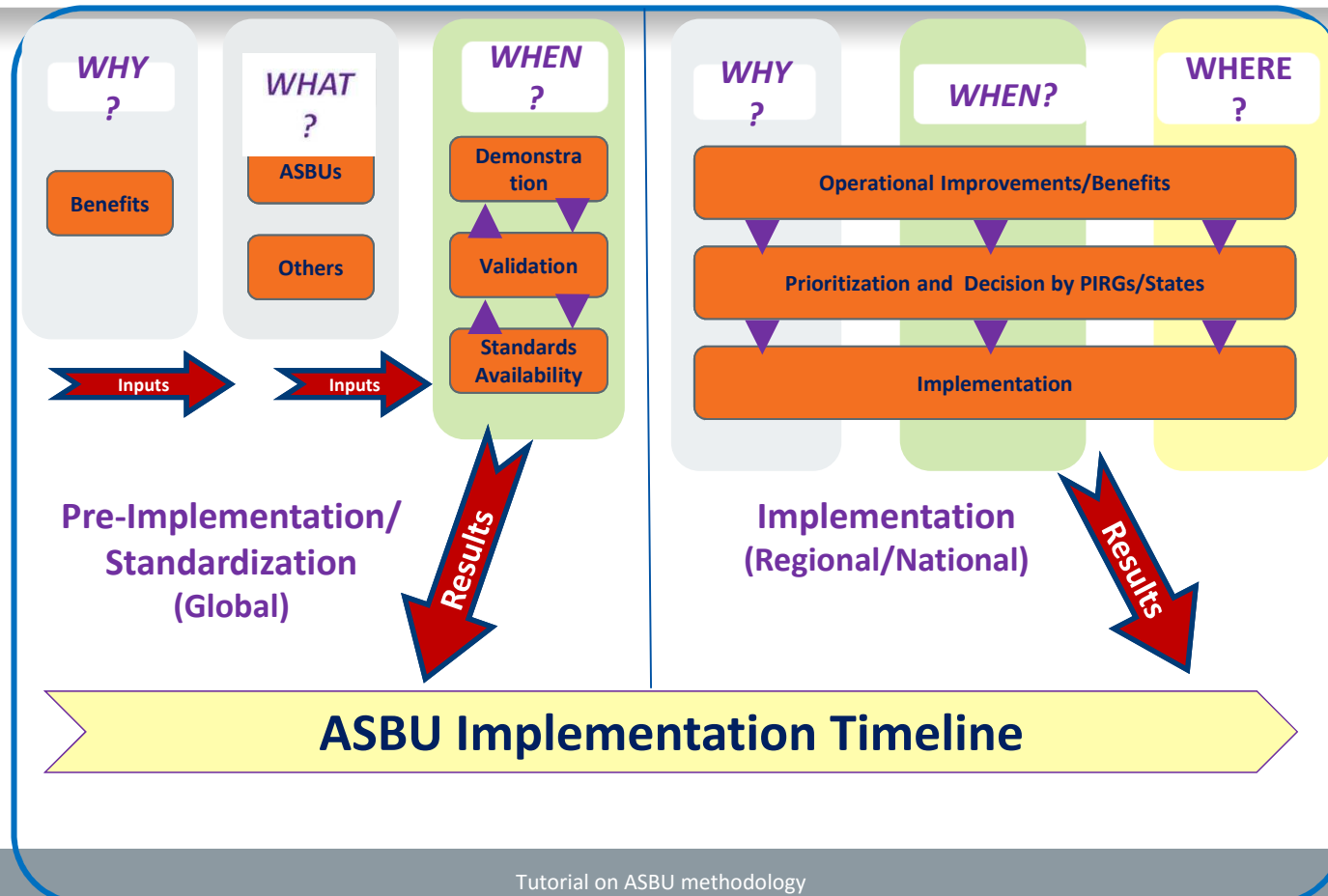
# Threads Between Modules... and Across Blocks





## How Blocks are organized?

- **Timing/sizing of the block upgrades are in response to**
  - **need for Mature standards,**
  - **Integrated air and ground solutions and**
  - **Establishment of positive business cases**
- **Block “0” optimizes current onboard equipage and provides baseline**
- **Modules lacking specific maturity are purposefully placed in later blocks**
- **Block upgrades respond to issue of non-homogeneous areas**





## Categorization of 15 Block 0 Modules

- **Essential (E):** These are the ASBU modules that provide substantial contribution towards **global interoperability, safety or regularity**.
- **Desirable (D):** These are the ASBU modules that, because of their strong business and/or safety case, are **recommended** for implementation almost everywhere.



## Categorization of Block 0 Modules

- **Specific (S):** These are the ASBU modules that are **recommended** for implementation to address a **particular operational environment or mitigate identified risks**.
- **Optional (O):** These are the ASBU modules that address **particular operational requirements** and provide **additional benefits that may not be common** everywhere.



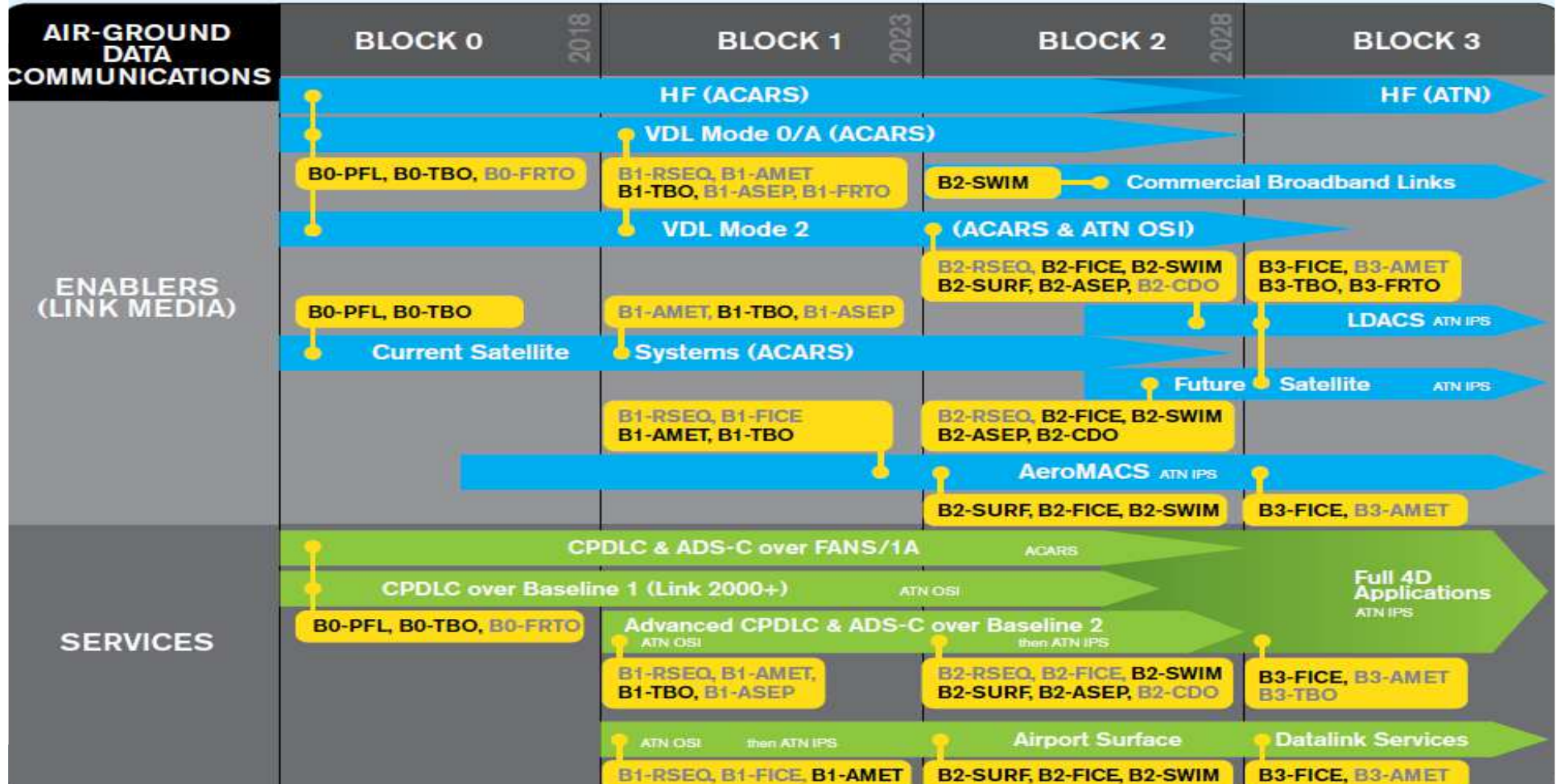


## Criteria for priority allocation

- **Priority 1** = Immediate Implementation
- **Priority 2** = Recommended Implementation

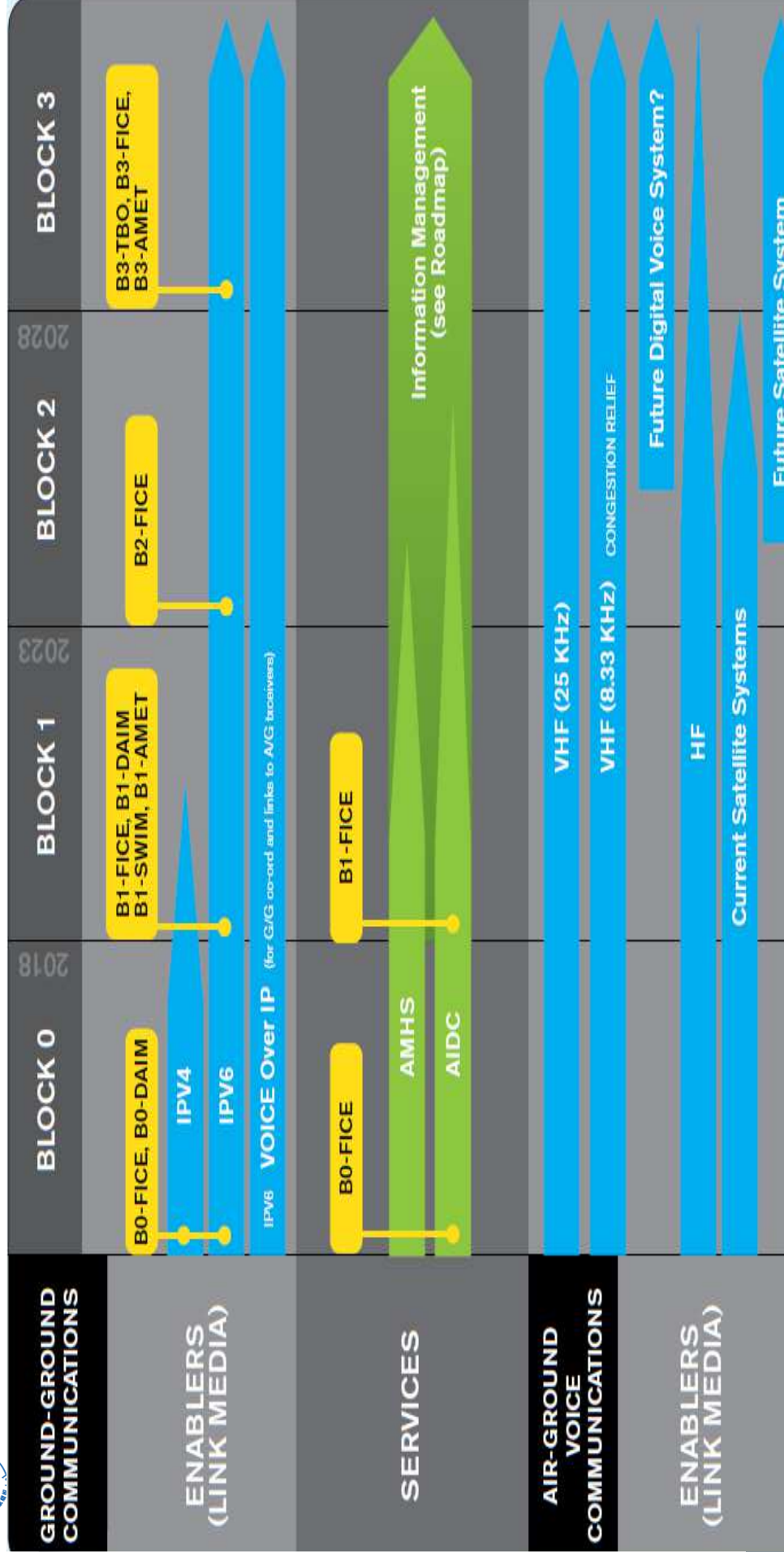


# Technology Roadmap



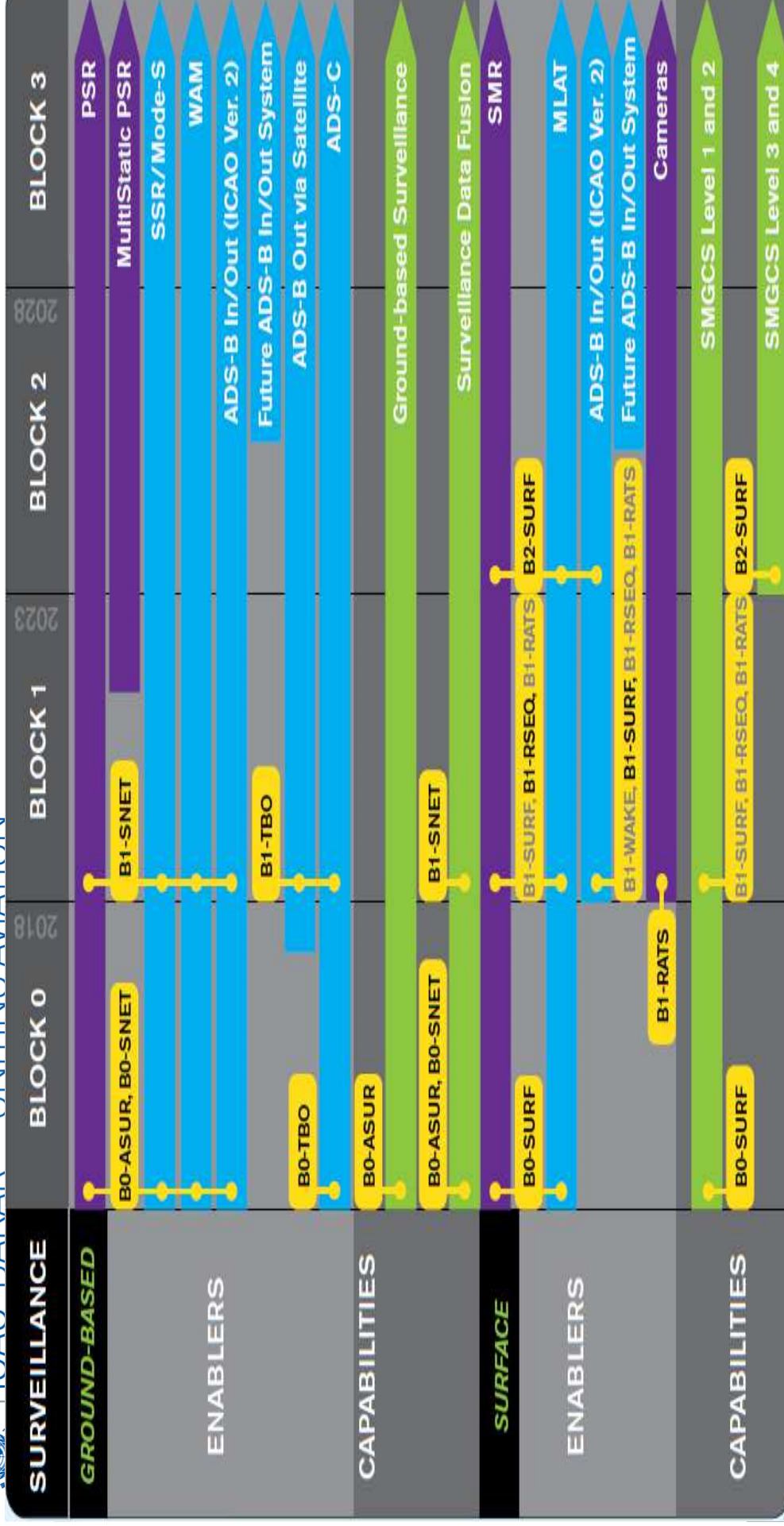


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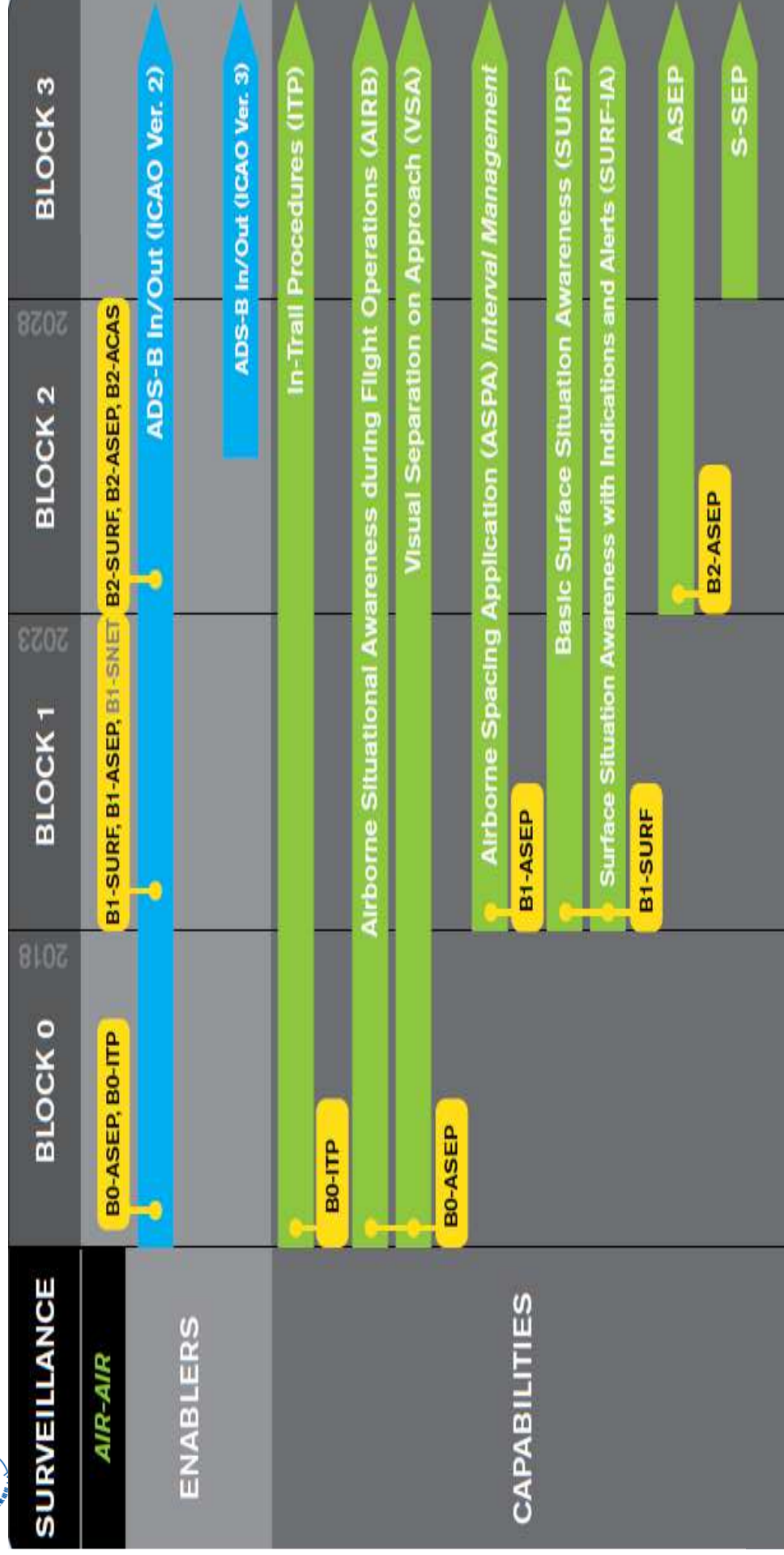


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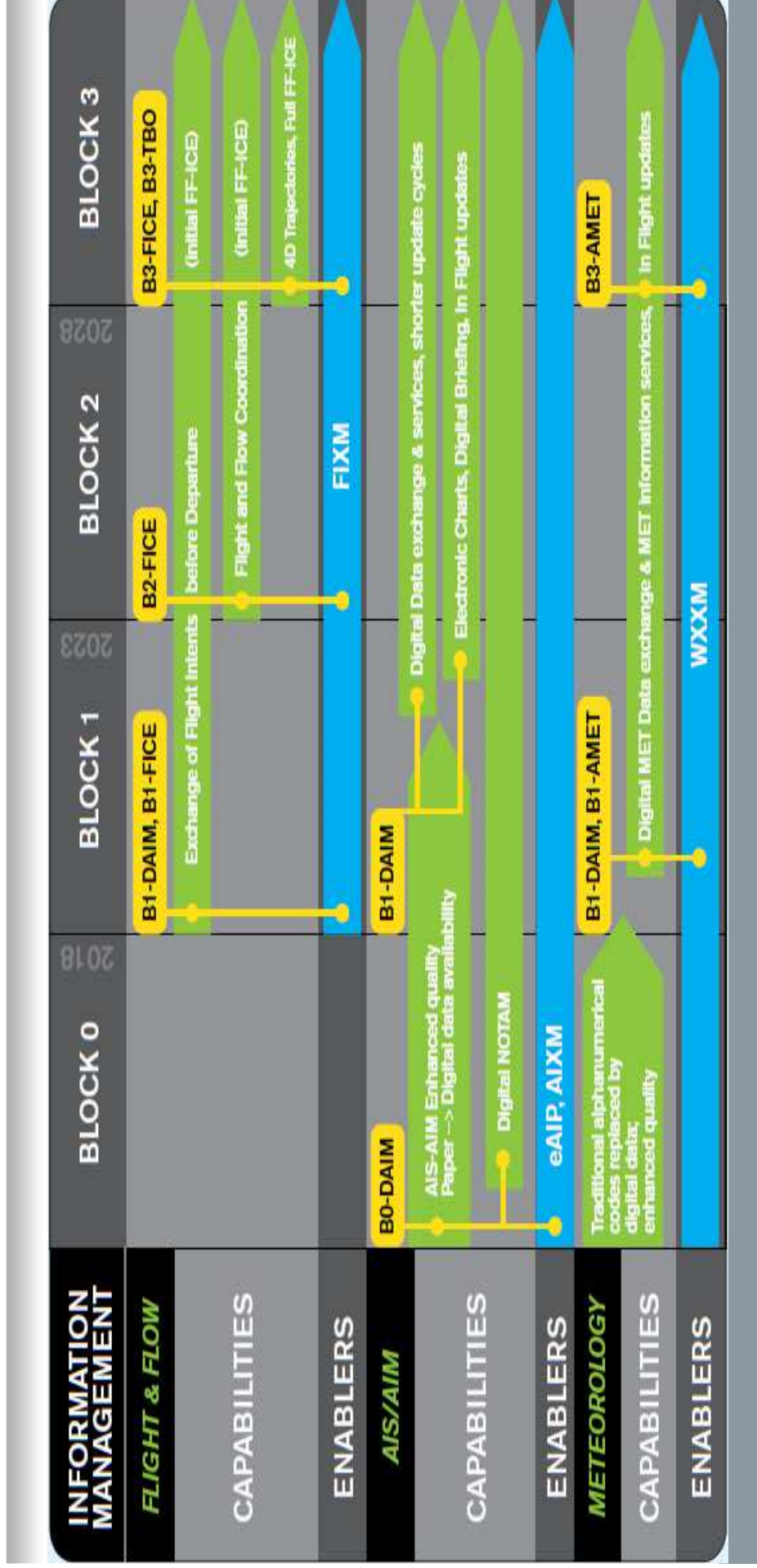
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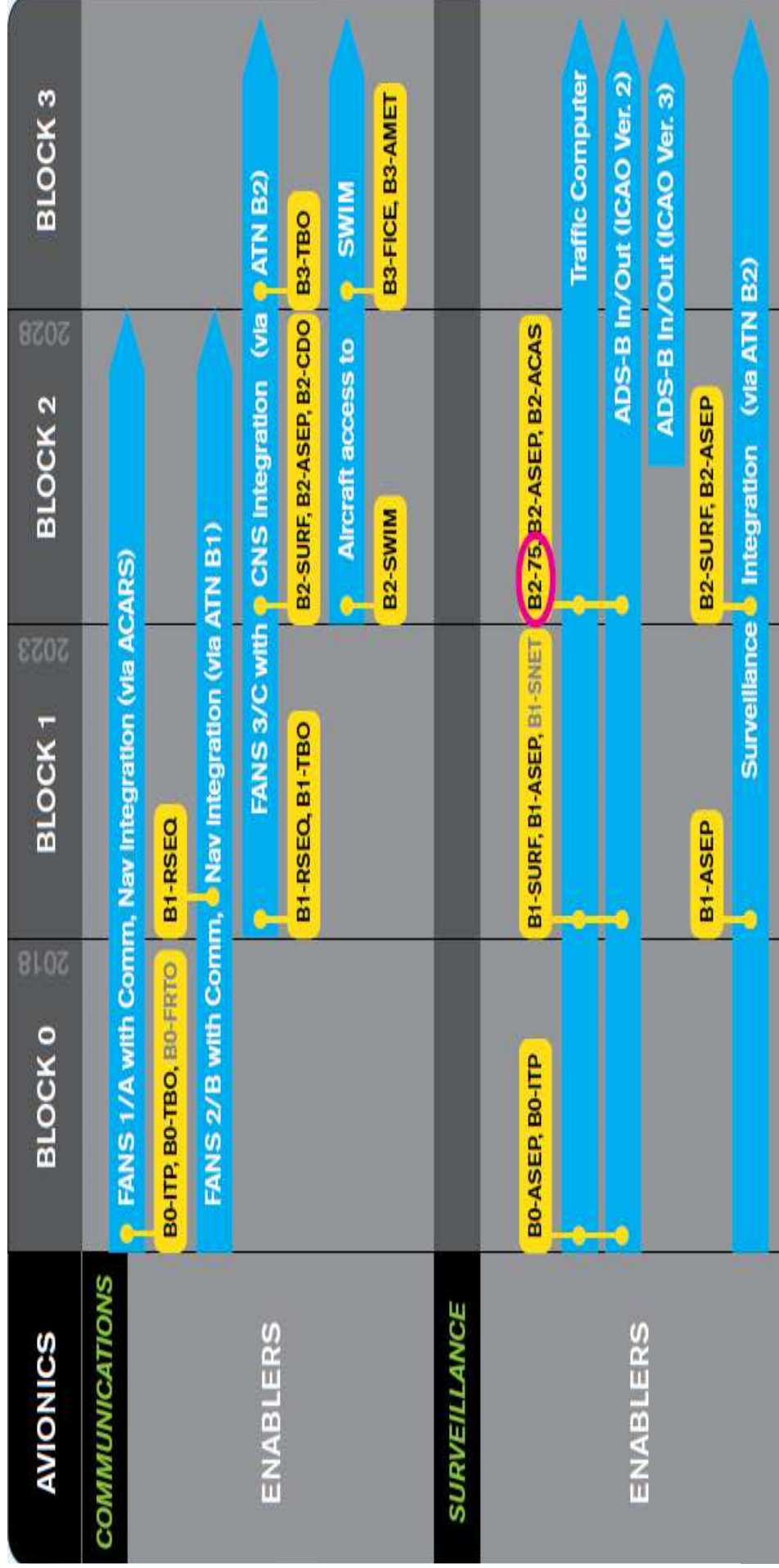


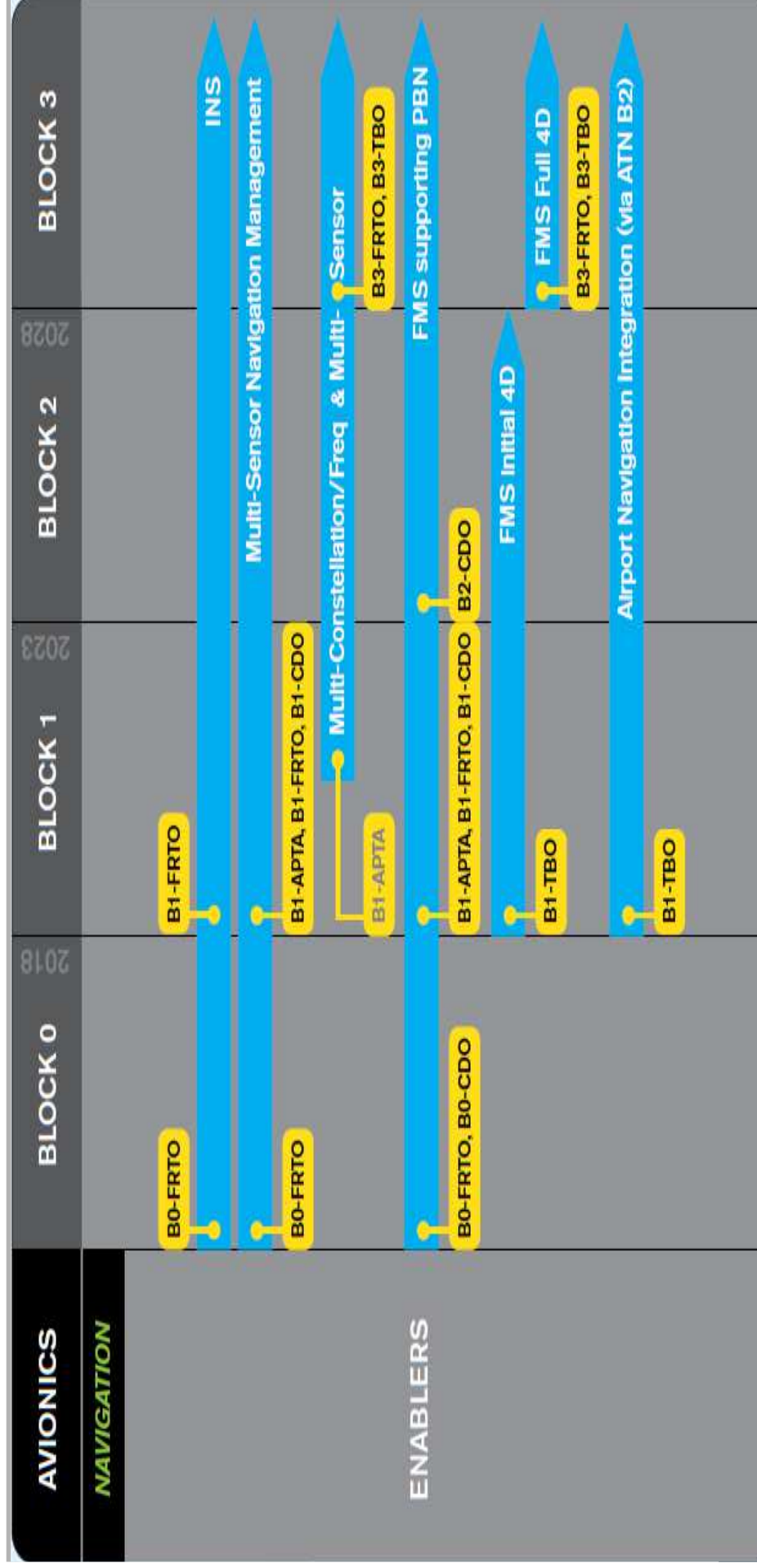
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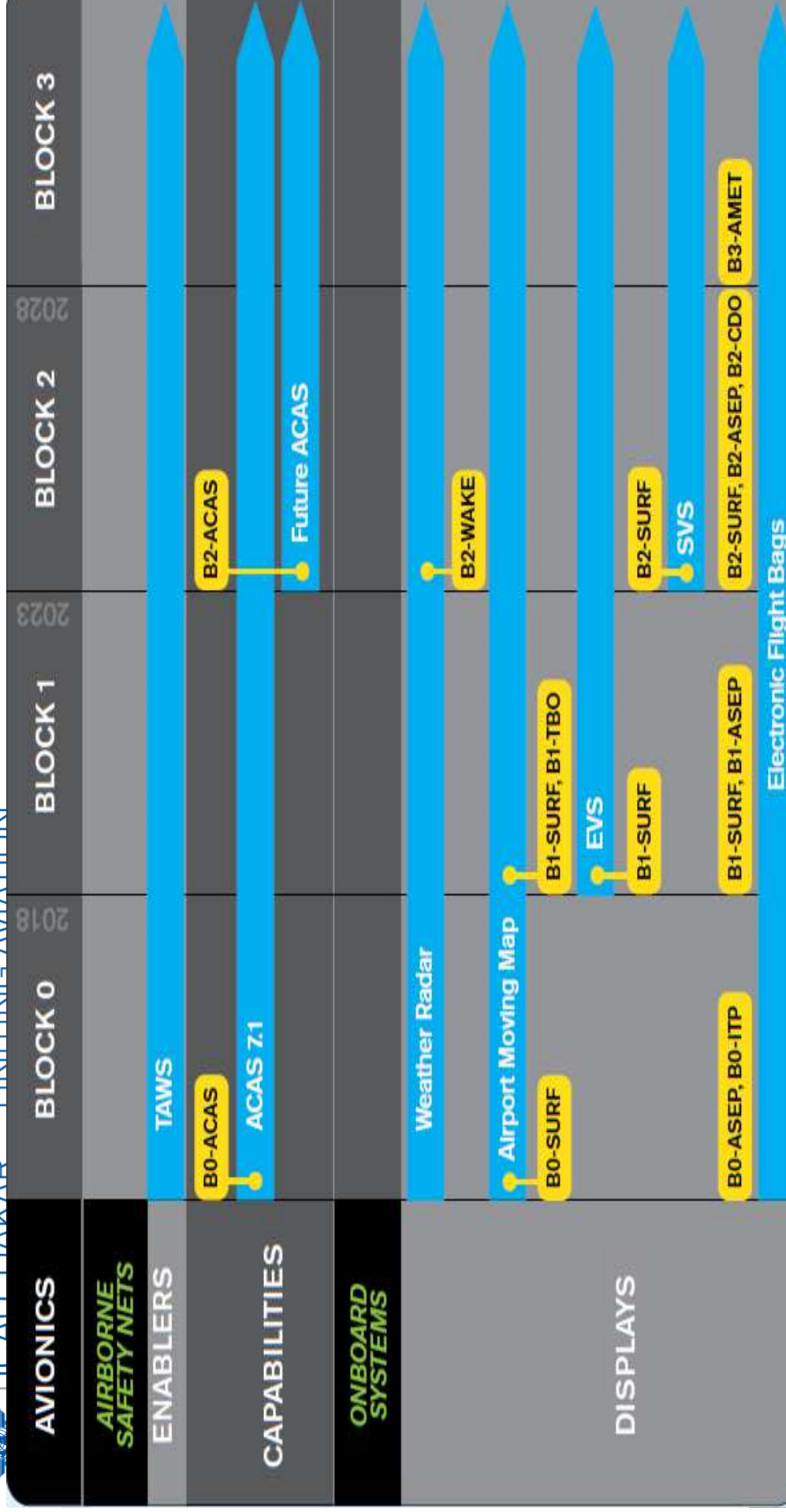
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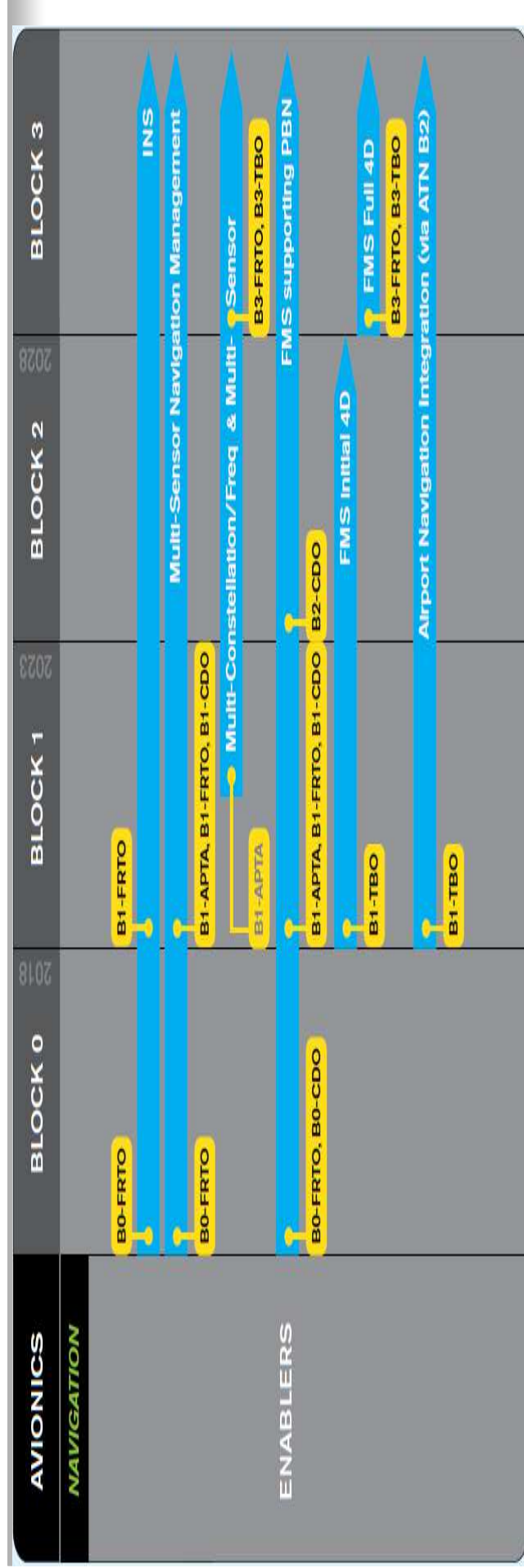


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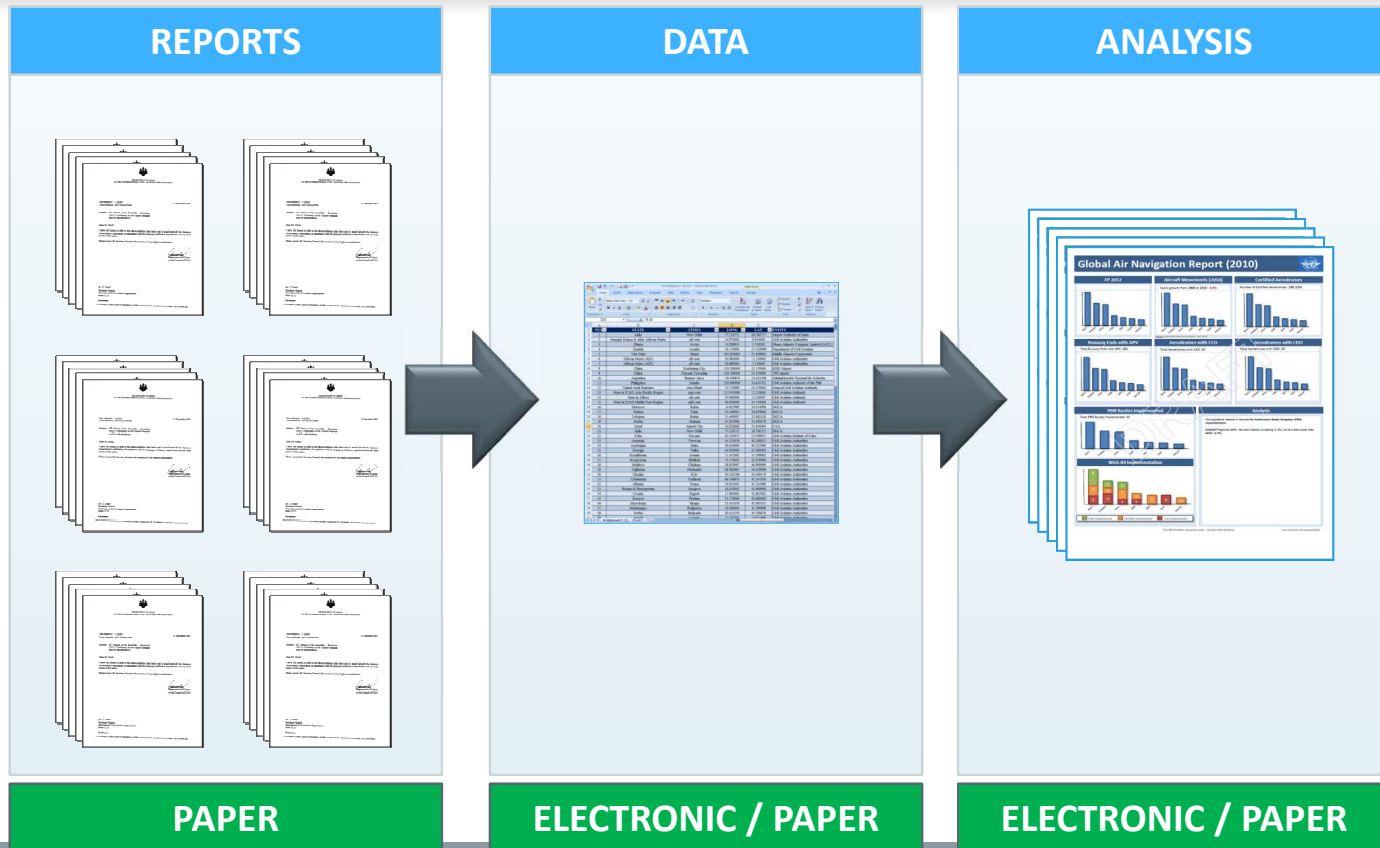


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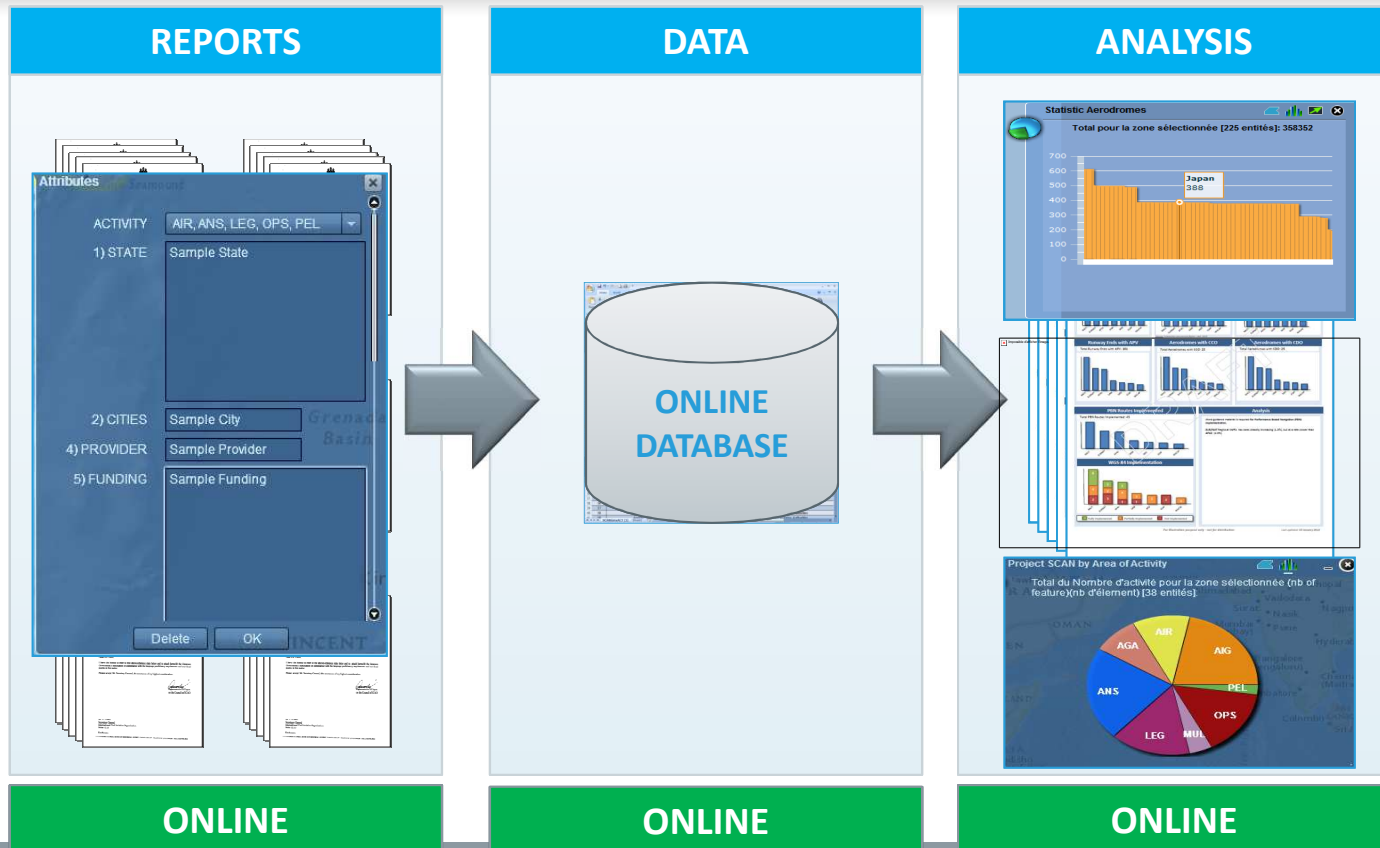


# Air Navigation Reporting Current





# Air Navigation Reporting Future





- **Visualize** the status of implementation through dynamic and interactive charts
- Provide **feedback** on the data (qualification of the data)
- Perform **self-assessments**, generate ad-hoc **reports** and **export** data
- Provide a venue for data collection towards the **Annual Reports**





## Annual Global Air Navigation Report

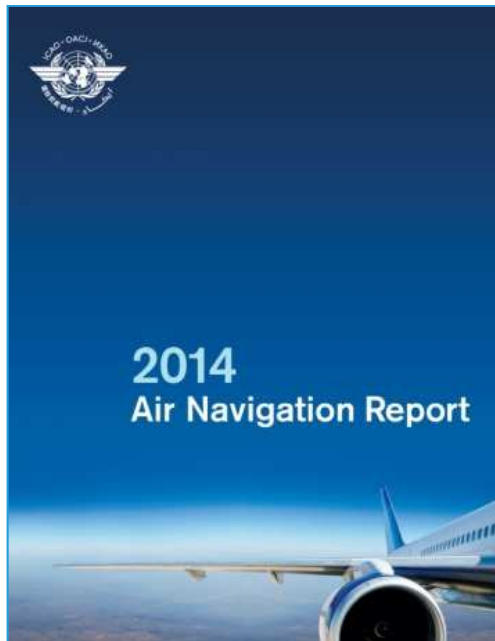
### Purpose

- Transparency and sharing of information are fundamental to a safe and efficient global air transportation system.
- Consistent with this principle and much like the existing annual Safety Report, the proposed annual Global Air Navigation Report will assist PIRGs and States in understanding which areas require special attention to effectively improve air navigation performance worldwide . **First Report in April 2014**
- Help propagate information on implementation success stories.
- Provide an opportunity for the civil aviation community to evaluate progress across different ICAO regions.
- Facilitate more effective interregional harmonization planning
- The outcomes of the Report could also help to identify annual tactical adjustment priorities for regional work programmes, as well as informing longer-term policy adjustments.



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## Annual Global Air Navigation Report Proposed contents

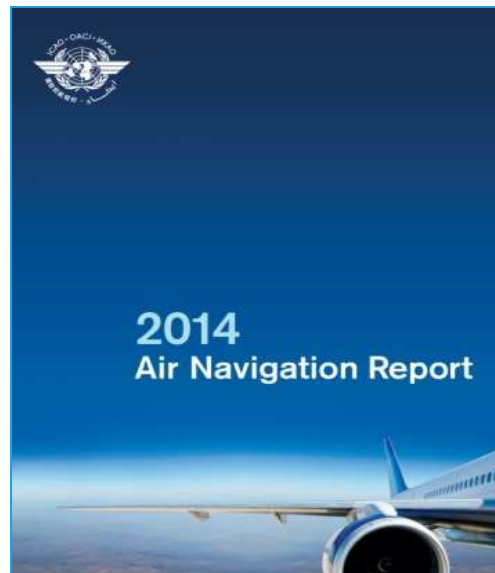


- **global air navigation challenges;**
- **measuring against those challenges;**
- **status of operational measures for performance improvement;**
- **implementation progress of selected priority ASBU Block 0 Modules.**
- **sharing of successful initiatives and key demonstrations**



## Annual Global Air Navigation Report An initial dataset

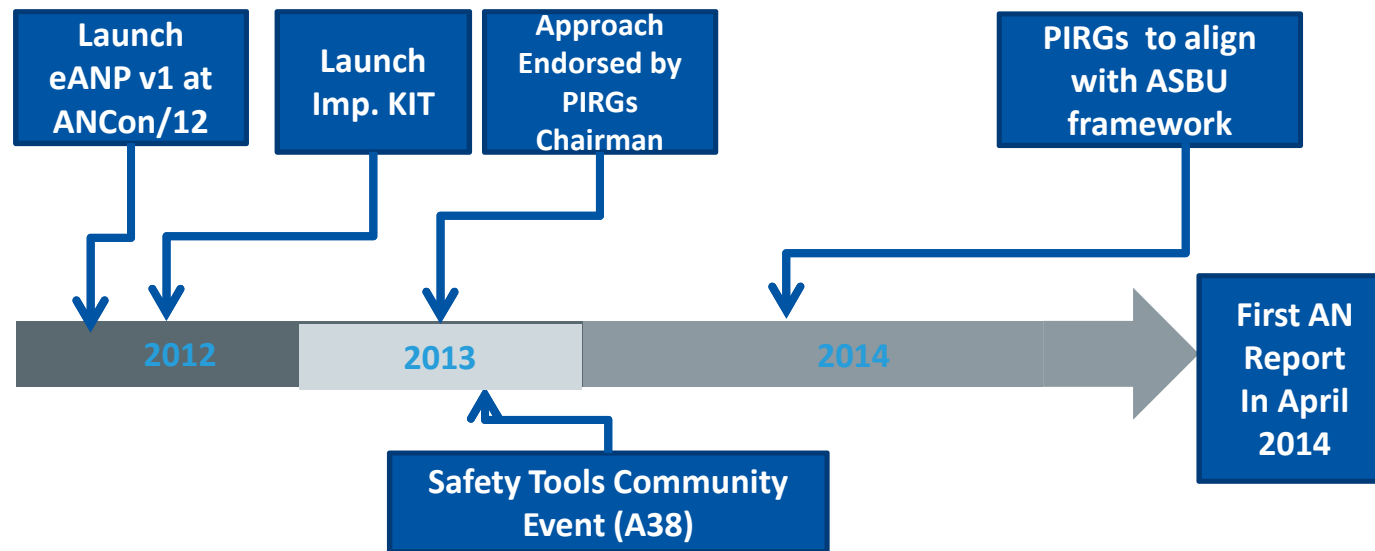
This initial dataset for both Regional Performance Dashboard and the Global Air Navigation Report was agreed by the PIRG Chairs in a coordination meeting held on 19 March 2013



- 1. Performance Based Navigation (PBN) - Terminal**  
*% of international aerodromes with APV*
- 2. Performance Based Navigation (PBN) - Enroute**  
*% of PBN routes/airspace*
- 3. Continuous Descent Operations (CDO)**  
*% of international aerodromes/TMAs with CDO*
- 4. Continuous Climb Operations (CCO)**  
*% of international aerodromes/TMAs with CCO*
- 5. Estimated Fuel Savings/ CO2 Emissions Reduction Based on IFSET**
- 6. Air Traffic Flow Management (ATFM)**  
*% of ATS Units/international aerodromes providing ATFM service*
- 7. Aeronautical Information Management (AIM)**  
*% of needed elements (from AIS to AIM Roadmap) facilitating the transition from AIS to AIM that have been implemented – PHASE I*



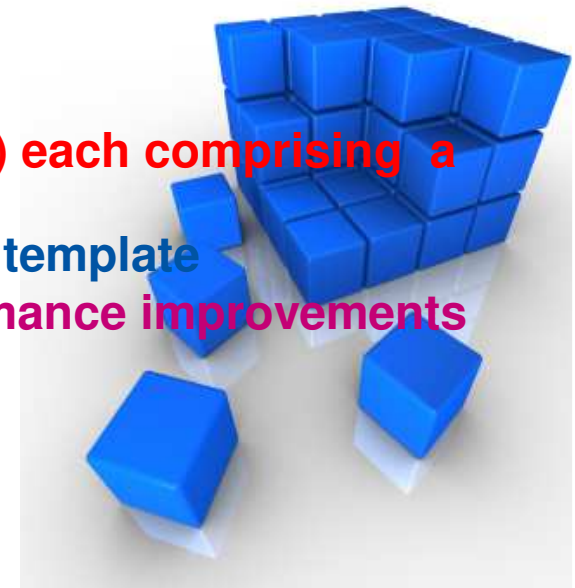
# Annual Global Air Navigation Report Initial tasks and Roll Out





## Summary of ASBU Approach

- Addresses ANSP, aircraft and regularity requirements
- Identified 4 improvement areas
- **Implementation through Block Upgrades ( 0,1,2, and 3) each comprising a number of modules**
- Each module is explained in a standardized 4-5 pages template
  - provide a series of **measurable, operational performance improvements**
  - Organized into **flexible & scalable** building blocks
  - Could be introduced as needed
  - all modules are **not** required in all airspaces





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THANK YOU