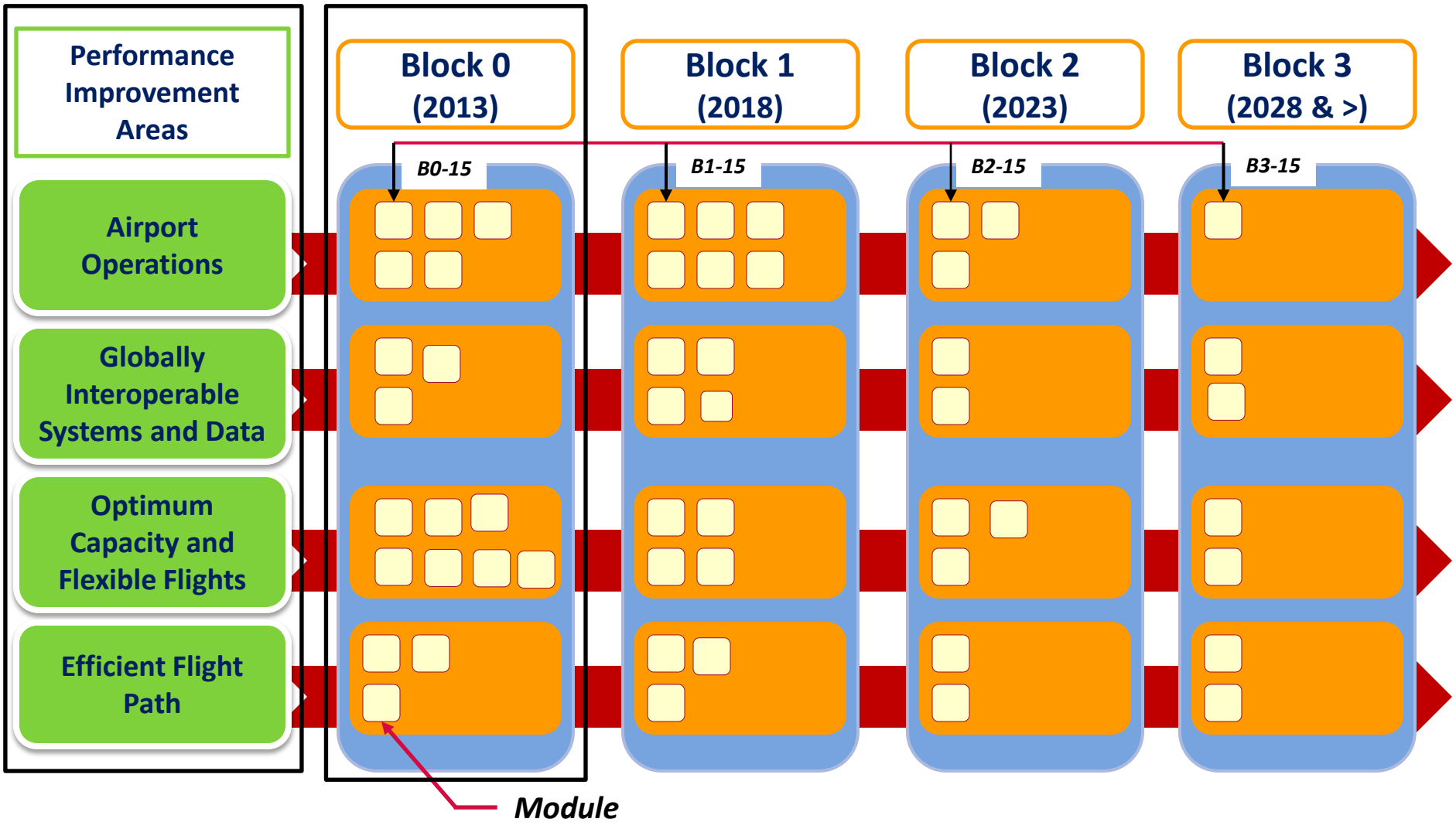
ASBU Methodology
Summary of Block 0 Modules

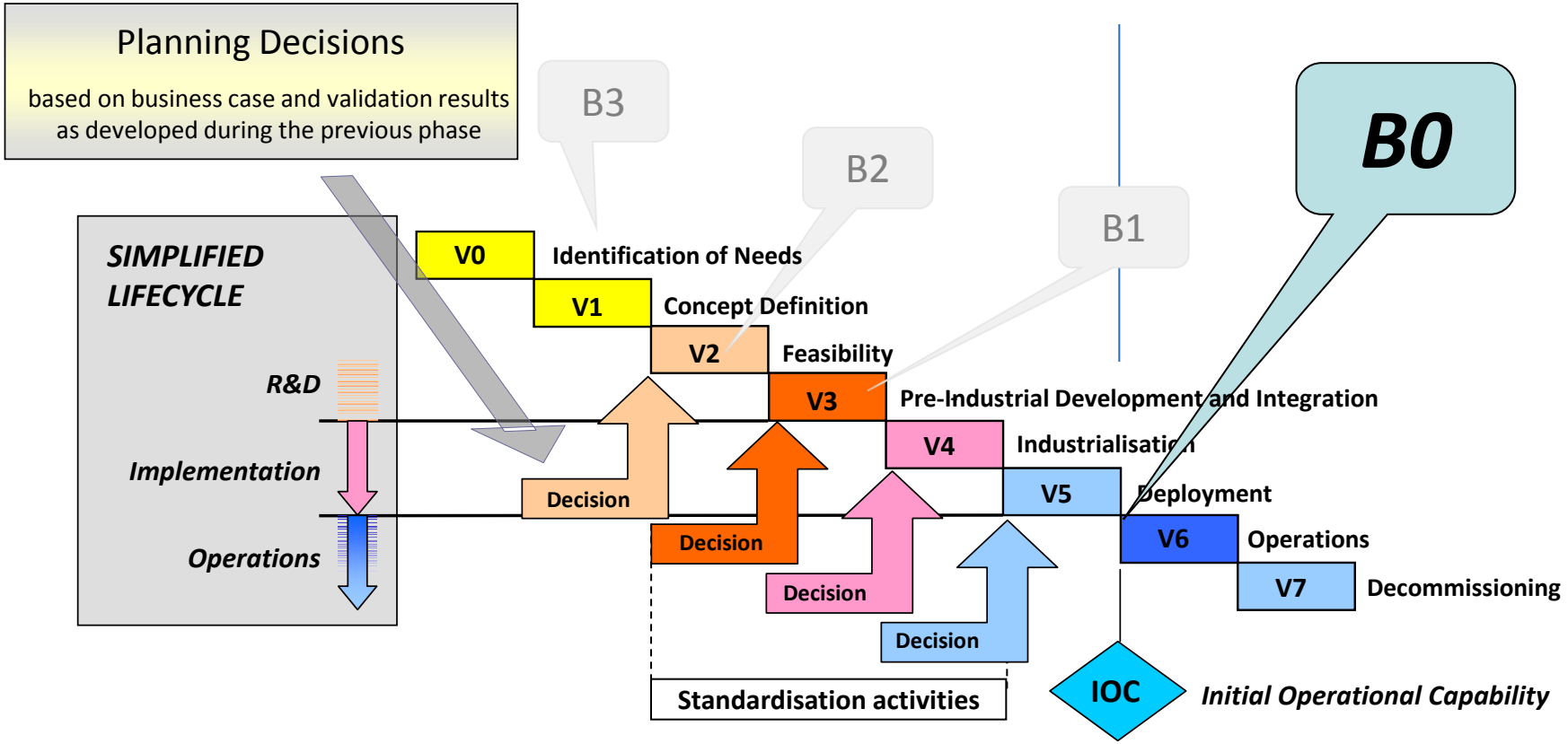
Outline

- Block understanding
- Block Maturity cycle
- Block 0 perspective
- Block 0 Modules
- Block 0 implementation

Understanding the Relationships

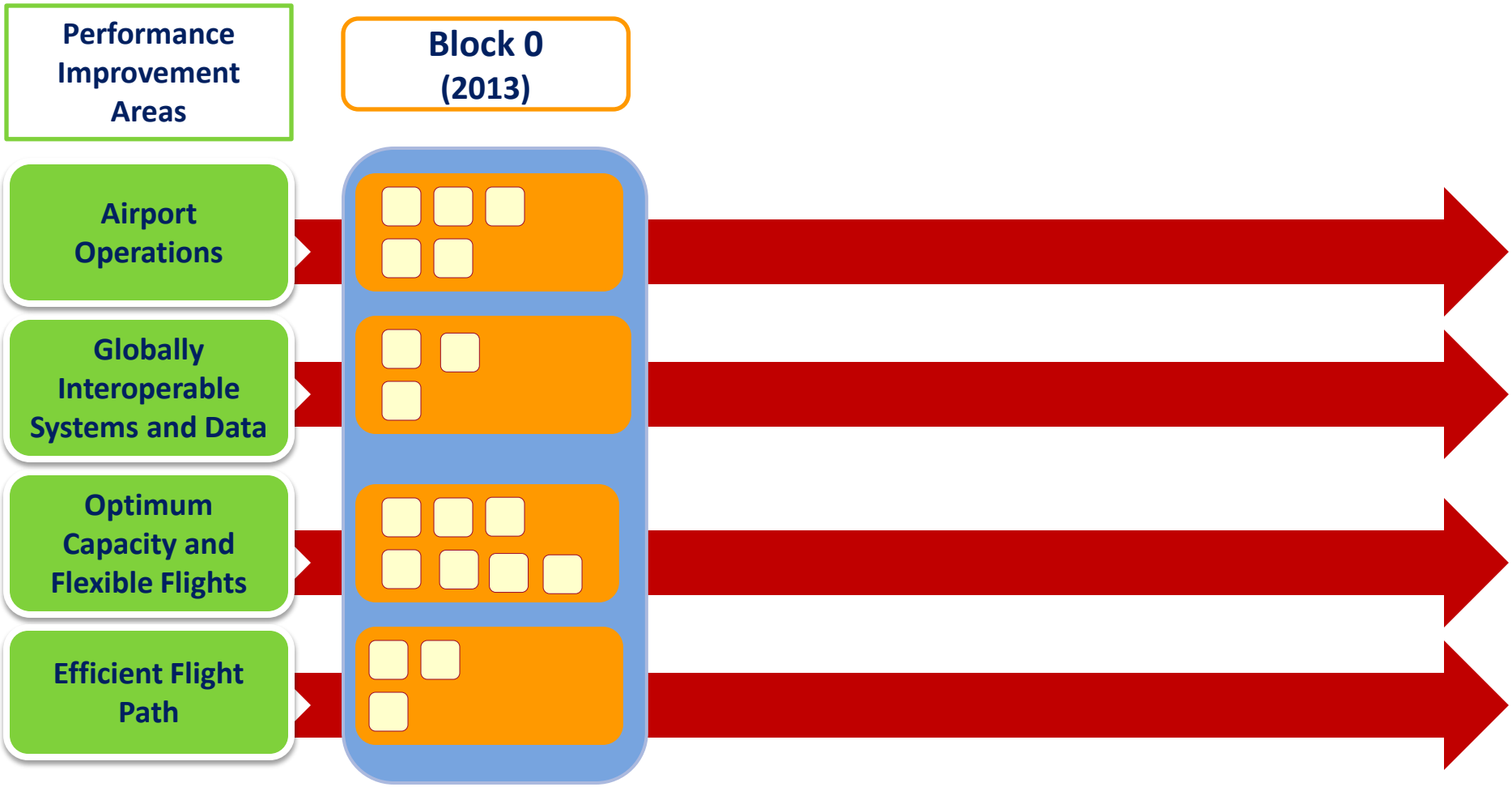


Block Maturity Lifecycle



B0: Capabilities available in 2013

Focus on Block 0



Global Readiness Checklist

Global Readiness Checklist		Status (ready or date)
	Standards Readiness	√
	Avionics Availability	√
	Infrastructure Availability	√
	Ground Automation Availability	√
	Procedures Available	√
	Operations Approvals	√

- Each Module is evaluated for its readiness
- If any component is not found to be ready it moves to a future Block for implementation
- Those Modules that are not specifically ready at a Block release are noted as “dates of readiness”

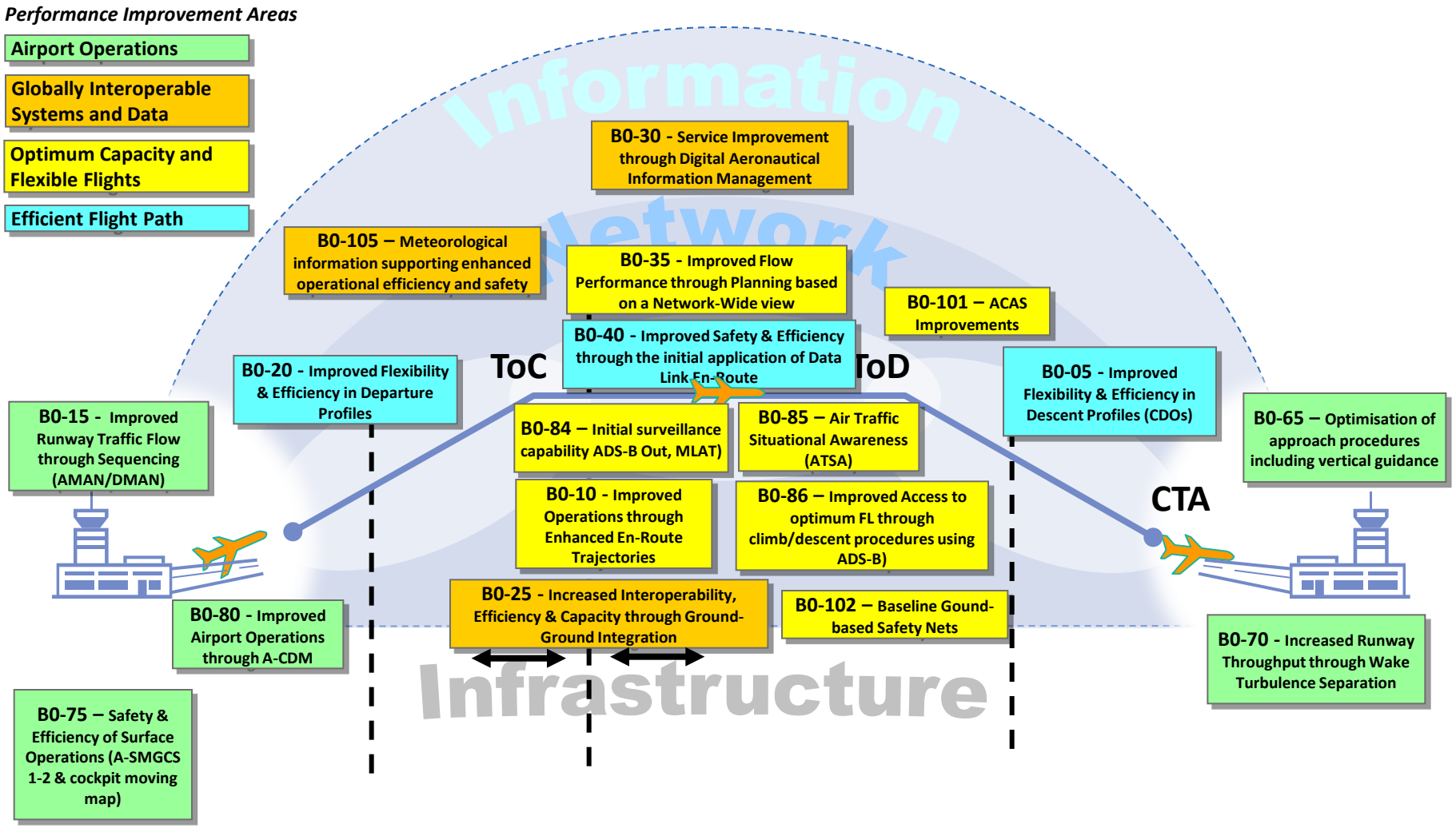
All Block 0 Modules Have Met the Readiness Criteria

Block 0

- 4 Main Performance improvement areas
  - Airport Operations (5 modules)
  - Globally interoperable systems & data (3 modules)
  - Optimum capacity & flexible flights (7 modules)
  - Efficient flight path (3 modules)

- Block 0 will serve as the enabler and foundation for the envisioned future aviation systems.

Block 0 in Perspective



Airport Operations (PIA 1)

B0-15
Improved Runway Traffic Flow through Sequencing (AMAN/DMAN)
Time-based metering to sequence departing and arriving flights

B0-65 - Optimization of Approach Procedures including Vertical Guidance
This is the first step toward universal implementation of GNSS-based approaches

B0-70
Increased Runway Throughput through Wake Turbulence Separation
Improved throughput on departure and arrival runways through the revision of current ICAO wake vortex separation minima and procedures (re-categorisation, CSPR and WIDAO)

B0-75
Improved Runway Safety (A-SMGCS)
Airport surface surveillance for ANSP

B0-80
Improved Airport Operations through ACDM
Airport operational improvements through the way operational partners at airports work together

The combined Block 0 Modules reduce fuel consumption and noise by improving arrival efficiencies and improving information sharing

Globally Interoperable Systems and Data (PIA 2)

B0-25
Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration
Supports the coordination of ground-ground data communication between ATSU based on ATS Inter-facility Data Communication (AIDC) defined by ICO Document 9694

B0-30
Service Improvement through Digital Aeronautical Information Management
Initial introduction of digital processing and management of information, by the implementation of AIS/AIM making use of AIXM, moving to electronic AIP and better quality and availability of data

B0-105 – Meteorological information supporting enhanced operational efficiency and safety
This module includes meteorological information supporting automated decision processes or aids such as meteorological information translation, ATM decision support. This module enables the reliable identification of applicable ATM solutions when meteorological conditions are impacting (observed) or expected to impact (forecast) aerodromes or airspace

In Block 0 we improve overall operations and continue to enable Collaborative Decision Making through improved interfacilities communications using standard information formats and baseline Met Services

Optimum Capacity and Flexible Flights (PIA 3)

B0-10: Improved Operations through Enhanced En-Route Trajectories
Implementation of performance-based navigation (PBN concept) and flex tracking to avoid significant weather and to offer greater fuel efficiency, flexible use of airspace (FUA) through special activity airspace allocation, airspace planning and time-based metering, and collaborative decision-making (CDM) for en-route airspace with increased information exchange among ATM stakeholders

B0-35:Improved Flow Performance through Planning based on a Network-Wide view
Collaborative ATFM measure to regulate peak flows involving departure slots, managed rate of entry into a given piece of airspace for traffic along a certain axis, requested time at a waypoint or an FIR/sector boundary along the flight.

B0-101 ACAS Improvements
This addresses short term improvements to the performance of the existing airborne collision avoidance systems (ACAS).

B0-85: Air Traffic Situational Awareness (ATSA)
ATSA provides a cockpit display of a graphical depiction of traffic to assist the pilot in out-the-window visual acquisition of traffic:

B0-86: Improved access to Optimum Flight Levels through Climb/Descent Procedures using ADS-B
The use of In Trail Procedure (ITP) facilitates en-route climb or descent to enable better use of optimal flight levels in environments where a lack of ATC surveillance and/or the large separation minima currently implemented is a limiting factor.

Using procedural concepts (e.g. RNP, FUA, etc.) and Air Traffic Situational Awareness - combined with enhanced planning tools and information sharing, the enroute phase of flight supports additional capacity and flexibility using the Modules of Block 0

Optimum Capacity and Flexible Flights (PIA 3) - Continued

B0-84 – Initial surveillance capability ADS-B Out, MLAT
Ground surveillance supported by ADS-B OUT and/or wide area multilateration systems will improve safety, especially search and rescue and capacity through separation reductions.

B0-102 – Baseline Ground-based Safety Nets
To monitor the operational environment during airborne phases of flight, the alerts such as Short Term Conflict Alert, Area Proximity Warnings and Minimum Safe Altitude Warnings are proposed in this module. Ground-based safety nets make an essential contribution to safety and remain required as long as the operational concept remains human-centred.

Through ground based safety nets combined with ground surveillance the enroute phase of flight supports additional capacity, flexibility and safety

Efficient Flight Path (PIA 4)

B0-05
Improved Flexibility and Efficiency in Descent Profiles (CDOs)
Deployment of performance-based airspace and arrival procedures that allow the aircraft to fly their optimum aircraft profile taking account of airspace and traffic complexity with continuous descent operations (CDOs)

B0-20
Improved Flexibility and Efficiency in Departure Profiles
Deployment of departure procedures that allow the aircraft to fly their optimum aircraft profile taking account of airspace and traffic complexity with continuous climb operations (CCOs)

B0-40
Improved Safety and Efficiency through the initial application of Data Link En-Route
Implementation of an initial set of data link applications for surveillance and communications in ATC

The use of procedurally based Optimized Profile Climbs and Descents as well as an initial Data Link Capability helps to establish a Block 0 capability for improved operational efficiencies

Block 0: Priority

- Block 0 initiatives must leverage on existing on-board avionics
- 3 Priorities have been agreed to by the Global community:
  - Performance Based Navigation (PBN)
  - Continuous Descent Operations (CDO)
  - Continuous Climb Operations (CCO)

Challenges - How to Get There?

- It is all about managing risk
- Block 0 risks are minimum
  - Global Readiness Checklist is complete
  - The Modules are well understood and supported
- But risks do exist
  - States may not be capable of ensuring successful deployment of Block 0
  - If Block 0 is not implemented as a foundation, certain functionalities may not be available as enablers for future blocks
  - We must Identify and resolve policies necessary to enable the future blocks now

Implementation – The Time is Now

- The Modules of Block 0 are ready for implementation today
  - Standards are ready
  - Avionics are ready
  - Procedures and Operational Approvals are in place
  - The Infrastructure is available
  - Ground Automation is ready
- Establishing the foundation for the future is now
- Care was taken to ensure that regional implementation of the Blocks or the Modules are well described and ready for implementation

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