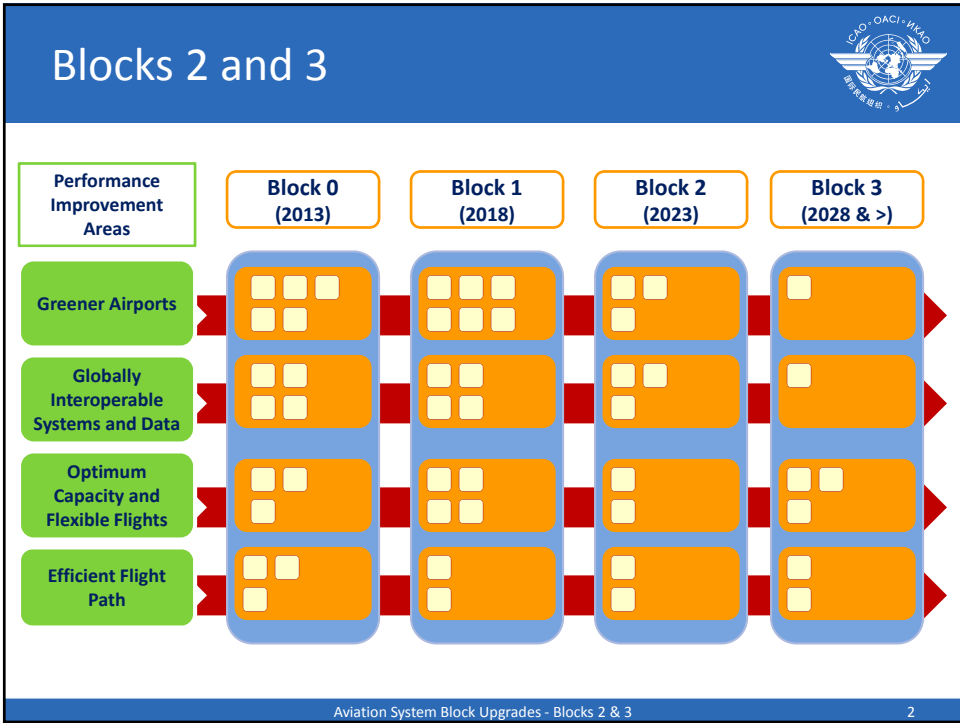


International Civil Aviation Organization

Aviation System Block Upgrades

Blocks 2 & 3

Preparations for AN-Conf/12 – ASBU
Methodology
Lima, 15 May 2012



Longer-term Objective: High Performance

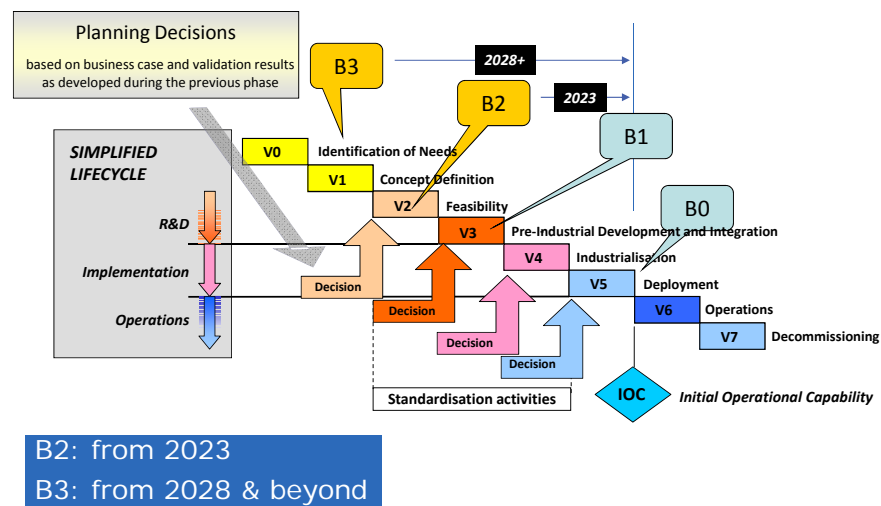


- 4 Main Performance improvement areas
 - Greener Airports
 - Globally interoperable systems & data
 - Optimum capacity & flexible flights
 - Efficient flight path
- ... increasingly interrelated as ATM is closer to optimum functioning

Aviation System Block Upgrades - Blocks 2 & 3

3

Block Maturity Lifecycle



Aviation System Block Upgrades - Blocks 2 & 3

4

3 Essential Considerations in the Global ATM Operational Concept



The network of actors & assets

The flight trajectory over time

Measured business performance



Informed decisions taken collaboratively on early and accurate information

Partnership – Interoperability

SWIM and data comm. are cornerstones

Aviation System Block Upgrades - Blocks 2 & 3

5

International Technical Challenges




- To ensure interoperability, in particular
 - Common time reference
 - New flight plan / flight object (FF-ICE)
 - 4D Trajectory exchange format
 - Information Management (data models, quality of service requirements, sharing rules, distribution process)
 - D/L applications for trajectory data exchange
 - Procedures for delegation ATC/Pilots
 - Time based separations
 - New wake vortex separations based on time
 - Participation of all airspace users

Will require new ICAO material and industry standards

Aviation System Block Upgrades - Blocks 2 & 3

6

Global Perspective




Global traffic development spreads the same issues globally

- > *We need global standards/interoperability, and not wait too long for that*
- > *Too many intermediate steps/standards make evolution more difficult*

Deployment where and when needed, but based on common principles/rules/data & interoperable technologies

- > *One size does not fit all*
- > *B2/3 implementation decisions not required now!*




Cooperation early in life cycle is more efficient

- > *Among programmes, within/across regions, with ICAO*
- > *On requirements, R&D activities*

Aviation System Block Upgrades - Blocks 2 & 3

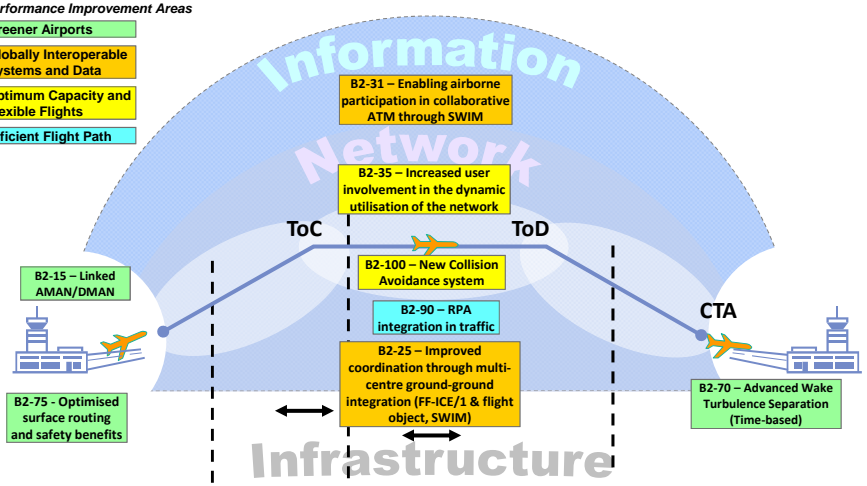
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Block 2 in Perspective



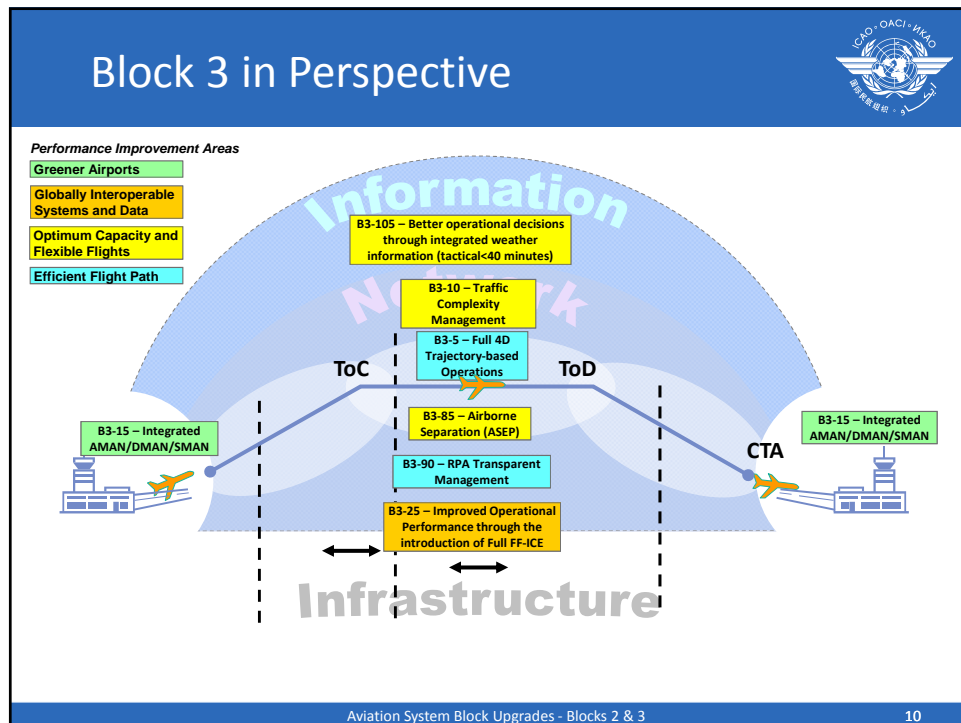
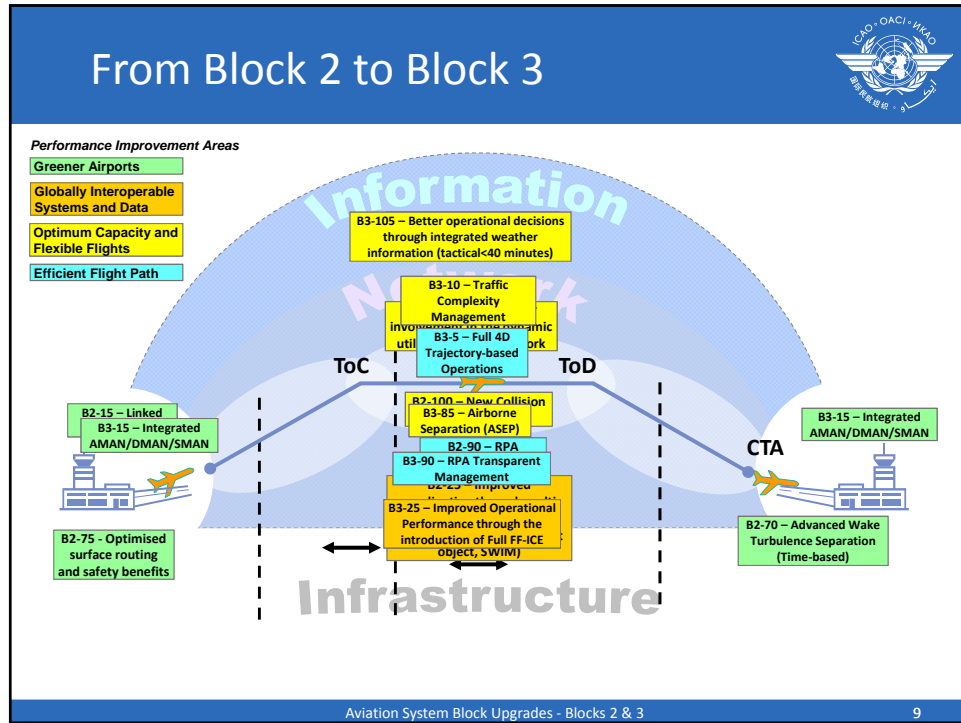
Performance Improvement Areas

- Greener Airports
- Globally Interoperable Systems and Data
- Optimum Capacity and Flexible Flights
- Efficient Flight Path



Aviation System Block Upgrades - Blocks 2 & 3

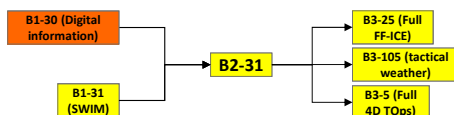
8



B2-31 – Enabling airborne participation in collaborative ATM through SWIM



Summary	This module allows the aircraft to be fully connected as an information node in SWIM, enabling full participation in collaborative ATM processes with access to voluminous dynamic data including meteorology. This will start with non-safety critical exchanges supported by commercial data links. The applications of this module are integrated into the processes and the information infrastructure which had evolved over the previous blocks.
Main Performance Impact	Access & Equity, Efficiency, Environment, Participation by the ATM Community, Predictability, Safety
Domain / Flight Phases	All phases of flight
Applicability Considerations	long-term evolution potentially applicable to all environments



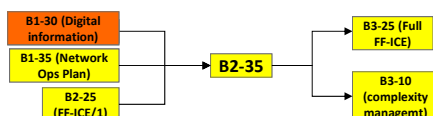
Aviation System Block Upgrades - Blocks 2 & 3

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B2-35 – Increased user involvement in the dynamic utilisation of the network



Summary	Introduction of CDM applications supported by SWIM that permit airspace users manage competition and prioritisation of complex ATFM solutions when the network or its nodes (airports, sector) no longer provide capacity commensurate with user demands.
Main Performance Impact	Capacity, Predictability
Domain / Flight Phases	Pre-flight phases
Applicability Considerations	Region or sub-region



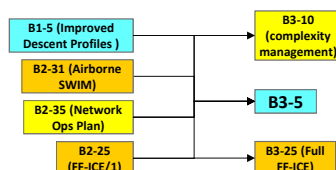
Aviation System Block Upgrades - Blocks 2 & 3

12

B3-5 – Full 4D Trajectory-based Operations



Summary	Advanced concepts supported by necessary technologies, for using four dimensional trajectories to enhance global ATM decision making. Integrating and exchanging all relevant flight information to obtain the most accurate trajectory representation in support of automation support.
Main Performance Impact	Efficiency, Environment, Predictability
Domain / Flight Phases	All Flight phases
Applicability Considerations	Region or sub-region



Aviation System Block Upgrades - Blocks 2 & 3

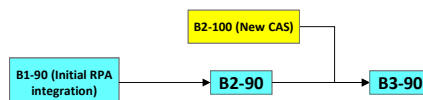
13

B2-90 – RPA integration in traffic

B3-90 – RPA transparent management



Summary	Stepped improvements: -B2: RPAS access to non-segregated airspace, refined RPAS operational procedures, standardized lost link procedures, working on detect and avoid technologies, moving RPAS toward full autonomous operations - B3: certification for RPAs in all classes of airspace, reliable C2 link, certified autonomous responses to potential incursions, airborne detection and avoidance, integration of RPA into aerodrome procedures
Main Performance Impact	Access & Equity, Capacity, Safety
Domain / Flight Phases	All phases of flight
Applicability Considerations	Region or sub-region



Aviation System Block Upgrades - Blocks 2 & 3

14

Challenges - How to Get There?



- Technical evolution towards Global ATM Concept
 - Multi-facility (ATC, aircraft, airport) consistency
 - Network-wide effects increase interdependence & sensitivity of solutions to local situations & perturbations
 - Increased cooperation within regions to optimise synchronised deployments
 - Inter-regional flights & cooperation as cement
 - Particular care to non-nominal situations upstream in the work
 - Need for interoperability / new standards
- Validate, demonstrate, standardise

Challenges - How to Get There?



- Ensure timely success of B0 & B1
 - As success story of an unprecedented global effort
 - As preparatory/initial steps (not requiring implementation of all modules)
 - To ensure availability of resources
- Agree on the way ahead and research programme

