Module 1

Workshop Introduction ADS-B/MLAT References and ASBU Implementation

ICAO/FAA Workshop on ADS-B and Multilateration Implementation (ADS-B/IMP)
Mexico City, Mexico, 19 to 22 May 2014

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OUTLINE

- Workshop Introduction
- ADS-B/MLAT References
- ADS-B as key enabler of the ASBU implementation

Events for this week

NACC Office- Kobe Meeting Room

19 to 22 May 2014

- ICAO/FAA Workshop on ADS-B and Multilateration Implementation (ADS-B/IMP)

  Join support by ICAO, the United States Federal Aviation Administration (FAA), and Servicios a la Navegación en el Espacio Aéreo Mexicano (SENEAM) Mexico

23 May 2014 - ANI/WG Task Force Meeting

- ADS-B Task Force Follow-up Meeting - Rapporteur: **Carlos Jimenez** (Cuba)

Aimed to: technical and operational professionals dedicated to the planning, use, and implementation of surveillance systems and situational awareness improvements; staff that are involved in the planning or replacement of radar systems; users of surveillance systems within States/Territories in the NAM/CAR Regions

Objetives (1/2)

- Follow-up previous ADS-B agreements (workshop) and regional related actions
- Provide a complete overview of ADS-B and Multilateration concepts
- Explain the importance of ADS-B and Multilateration as technical enablers for ICAO Aviation System Block Upgrades (ASBUs)
- Provide operational guidance and assistance for ADS-B and Multilateration surveillance techniques

Objetives (2/2)

- Promote ADS-B activities - trials and operational implementation – with identification of any concern/limitation for State implementation, and agreements for the regional implementation ADS-B target date

- Provide information on aspects to be considered in the planning and implementation of ADS-B surveillance and Multilateration systems

Methodology

- ADS-B/MLAT training material (hardcopy only: ICAO-EUROCONTROL agreement)
- State/User presentations (implementation) by the facilitators/ speakers (electronically available at: http://www.icao.int/NACC/Pages/meetings-2014-adsbimp.aspx)
- Visit to SENEAM ADS-B facilities
- Interactive discussions/ comments at the end of each presentation
- Exchange of implementation experiences/ lessons learned
- Executive summary of discussions

WORKSHOP PROGRAMME

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
8:30 – 9:00	REGISTRATION			
9:00 – 10:30	Opening / Group Photo Module 1: ICAO: Introduction to ADS B/ MLAT matters ASBU implementation Module 2: Introduction to Surveillance -Definition of Surveillance -Definition of Surveillance Techniques	Module 4: Introduction to Multilateration (MLAT) -Purpose of WAM -Purpose for surface movement -Multilateration Concept	Module 5: Avionics -Definition of Avionics -Certification Process -On-board Surveillance Equipment -Different Messages and DF (Donwlink Format) going out of the aircraft -Conclusion	Module 8: Implementation ICAO: Implementation Guidance for ADS-B and Implementation in the CAR/NAM Regions ADS-B Operational Concept and separation implementation: ICAO guidance Presentation: Example of ADS-B Implementation Program and WAM -Phase 1 -Phase 2 -Phase 3
10:30 – 11:00	C o f f e e B r e a k			
11:00 – 12:30	Module 2: Introduction to Surveillance (cont) -Definition of Surveillance Categories -Knowledge of Surveillance Chain -Background information about Mandates	Module 4: Introduction to Multilateration (MLAT) -Time Difference of Arrival (TDOA) -Target Detection and Tracking -Conclusion	Module 6: Safety Overview -Definition of Safety - Safety Management System - Safety Risk Management - Risk Analysis -Safety Analysis -Conclusion	State/ User Presentations: (cont) Mexico (SENEAM) Cuba COCESNA BOEING
12:30 – 01:30		Lunch break		
01:30 – 02:30	Module 3: Introduction to ADS-B -Definition of ADS -ADS-B OUT, ADS-B IN -ADS-B Technologies	Visit to SENEAM ADS-B Facilities	Module 7: SUR-CHAIN Integration of ADS-B/MLAT -Surveillance Chain Overview -ASTERIX Implementation	State/ User Presentations: (cont): Space-based ADS-B (Nav Canada) ICAO ASIA_PAC ADS-B Implementation Status
02:30 – 03:00	C o f f e e B r e a k		C o f f e e B r e a k	
03:00 – 04:00	Module 3: Introduction to ADS-B (cont)		Module 7: SUR-CHAIN Integration of ADS-B/MLAT (cont) -Fusion	ADS-B TF Module 9: Workshop Summary

Administrative issues

Security Considerations

Internet

no phones/ emails

Punctuality

Participation

Assistance

ICAO References for ADS-B/MLAT

- **ADS-B:**
  - VDL Mode 4 : SARPs in Annex 10 Vol III
  - UAT: SARPs in Annex 10 Vol III
  - 1090 ES: Annex 10 Vol. IV Surveillance and Collision Avoidance Systems, Chapter 5.
    - version 0 and version 1 extended squitter ADS-B message formats are included in Doc 9871
    - Version 2
    - MLAT: SARPs in Annex 10 Vol IV, Chapter 6.
- **ADS-C:**
  - SARPs in Annex 10 Vol III,
  - ATN SARPs and
  - related data link applications
  - GOLD Document

ICAO References for ADS-B/MLAT

- ✓ Manual on the SSR Systems (Doc 9684)
- ✓ Manual on Testing of Radio Navaids (Doc 8071), Vol III (Testing of Surveillance Radar Systems)
- ✓ Manual on Mode S Specific Services (Doc 9688)
- ✓ ACAS Manual (Doc 9863)
- ✓ Technical Provisions for Mode S Services and Extended Squitter (Doc 9871)

ICAO References for ADS-B/MLAT

- ✓ Manual on UAT (Doc 9861)
- ✓ Manual on VHF Digital Link (VDL) Mode 4. (Doc 9816)
- ✓ Manual of Air Traffic Services Data Link Applications (Doc 9694)
- ✓ Aeronautical Surveillance Manual (Doc 9924)

ICAO References for ADS-B/MLAT

- ✓ Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM) Chapters 6 and 8 (Doc 4444)
- ✓ Circular 326/AN188, Assessment of ADS-B and Multilateration Surveillance to Support Air Traffic Services and Guidelines for Implementation (appendices)
- ✓ Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS) (Doc 8168)
- ✓ Manual of Surface Movement Guidance and Control Systems (SMGCS) (Doc 9476)
- ✓ Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual (Doc 9830)

ICAO References for ADS-B/MLAT References

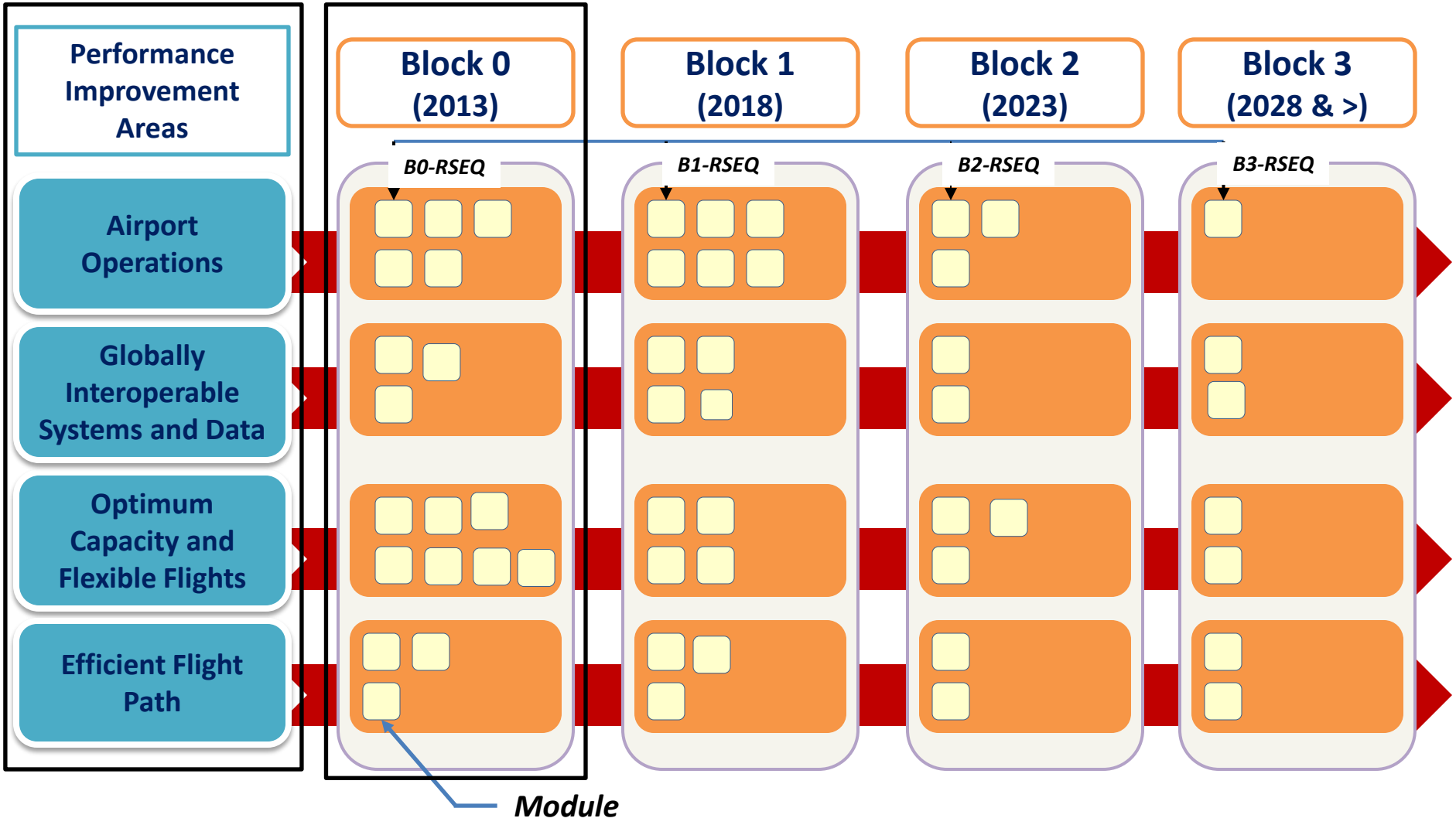
European Organization for Civil Aviation Equipment (EUROCAE)

- EUROCAE ED-73C, *MOPS for Secondary Surveillance Radar Mode S Transponders.*
- EUROCAE ED-117, *MOPS for Mode S Multilateration Systems for Use in A-SMGCS.*
- EUROCAE ED-142, *Technical Specifications for Wide Area Multilateration System (WAM).*

RTCA

- RTCA/DO-181D, *Minimum Operational Performance Standards for Air Traffic Control Radar Beacon System/Mode Select (ATCRBS/Mode S) Airborne Equipment*
- RTCA/DO-260, *Minimum Operational Performance Standards for 1090 MHz Automatic Dependent Surveillance — Broadcast (ADS-B)*
- RTCA/DO-260A, *Minimum Operational Performance Standards for 1090 MHz Extended Squitter Automatic Dependent Surveillance — Broadcast (ADS-B) and Traffic Information Services — Broadcast (TIS-B)*

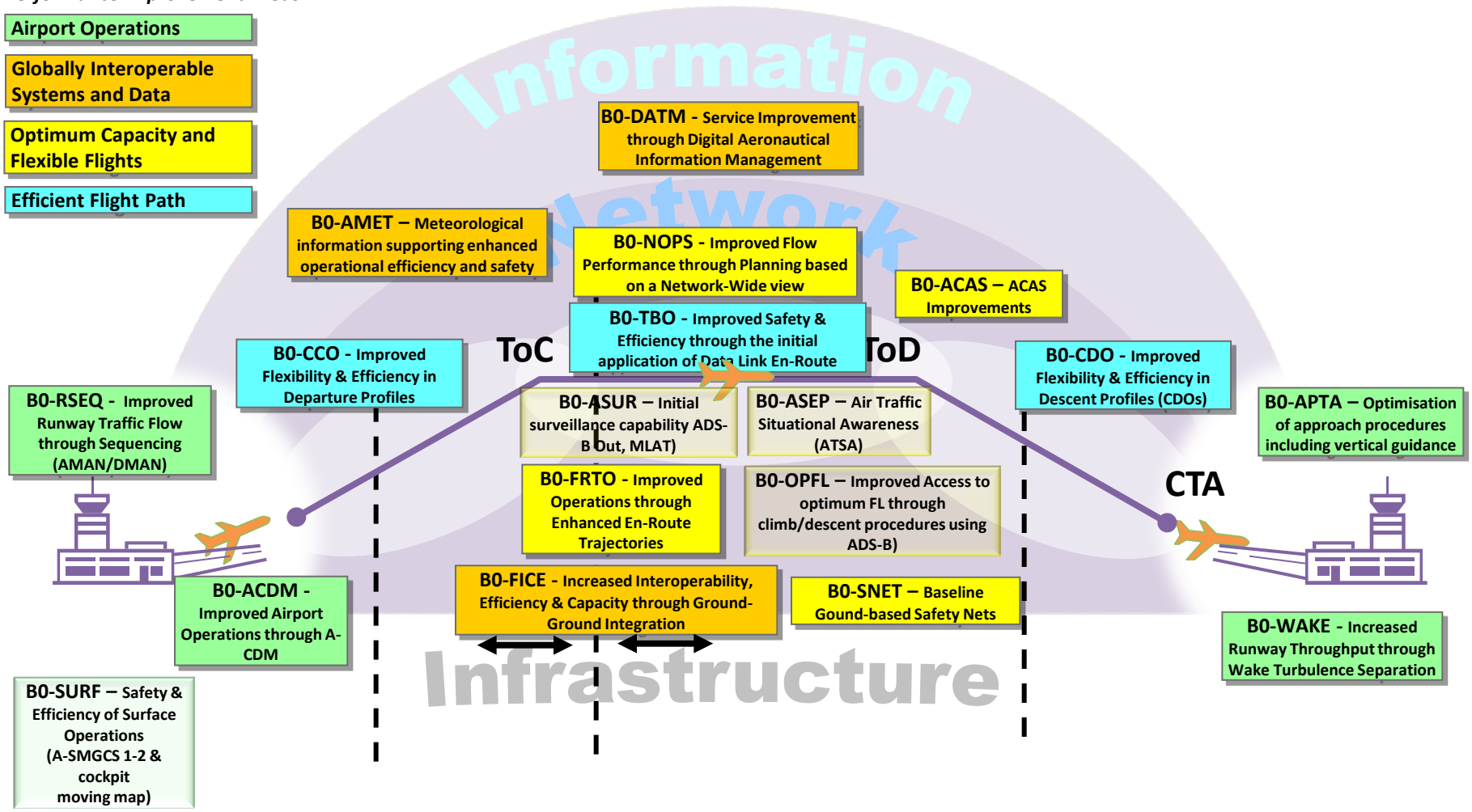
ADS-B as key enabler of the ASBU implementation



ADS-B as key enabler of the ASBU implementation

Performance Improvement Areas

- Airport Operations
- Globally Interoperable Systems and Data
- Optimum Capacity and Flexible Flights
- Efficient Flight Path



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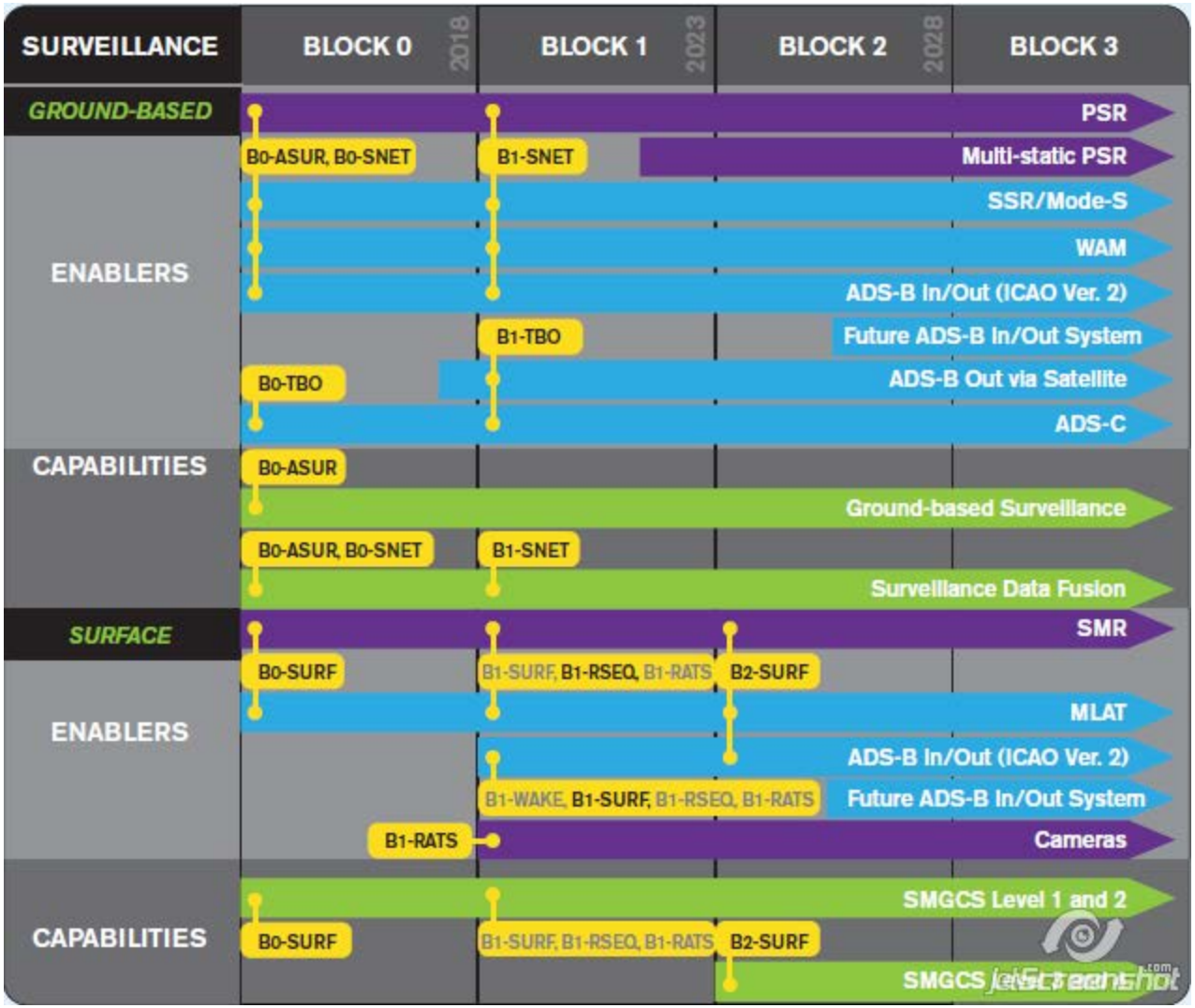


ADS-B as key enabler of the ASBU implementation

B0-75 SURF
Increased Effectiveness of Ground-Based Safety Nets.
Improvements to the effectiveness of the ground-based safety nets assisting the Air Traffic Controller and generating, in a timely manner, alerts of an increased risk to flight safety (such as short terms conflict alert, area proximity warning and minimum safe altitude warning).

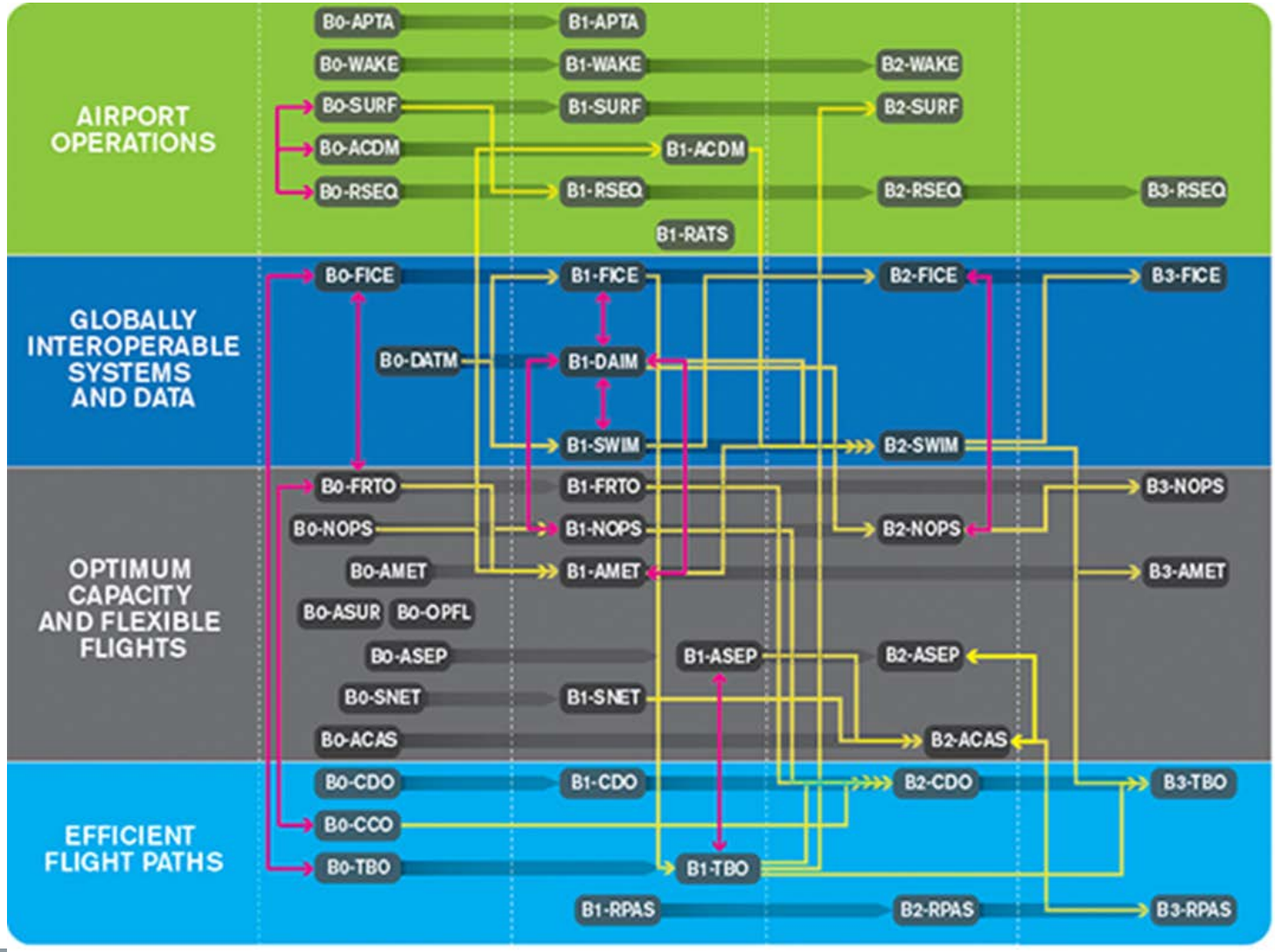
B0-86: OPFL
Improved access to Optimum Flight Levels through Climb/Descent Procedures using ADS-B
The use of In Trail Procedure (ITP) facilitates en-route climb or descent to enable better use of optimal flight levels in environments where a lack of ATC surveillance and/or the large separation minima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

B0-84 ASURF
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 – SNET
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.

B0-85: ASEP
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: AIRB and VSA

ADS-B as key enabler of the ASBU implementation



Questions?

Thank You