Appendix A: Summary Table of Aviation System Block Upgrades Mapped to Performance Improvement Areas

Performance Improvement Area 1: Greener Airports

Block 0	Block 1	Block 2	Block 3
B0-65 **Improved Airport Accessibility** This is the first step toward universal implementation of GNSS-based approaches	**B1-65** **Optimised Airport Accessibility** This is the next step in the universal implementation of GNSS-based approaches		
B0-70 **Increased Runway Throughput through Wake Tubulence Separation** Improved throughput on departure and arrival runways through the revision of current ICAO wake vortex separation minima and procedures .	**B1-70** **Increased Runway Throughput through Dynamic Wake Turbulence Separation** Improved throughput on departure and arrival runways through the dynamic management of wake vortex separation minima based on the real-time identification of wake vortex hazards	**B2-70 (*)** **Advanced Wake Turbulence Separation (Time-based)**	
B0-15 **Improved RunwayTraffic Flow through Sequencing (AMAN/DMAN)** Time-based metering to sequence departing and arriving flights	**B1-15** **Improved Airport operations through Departure, Surface and Arrival Management** Extended arrival metering, Integration of surface management with departure sequencing bring robustness to runways management and increase airport performances and flight efficiency	**B2-15** **Linked AMAN/DMAN** Synchronised AMAN/DMAN will promote more agile and efficient en-route and terminal operations	**B3-15** **Integrated AMAN/DMAN/SMAN** Fully synchronised network management between departure airport and arrival airports for all aircraft in the air traffic system at any given point in time
B0-75 **Improved Runway Safety (A-SMGCS Level 1-2 and Cockpit Moving Map)** Airport surface surveillance for ANSP	**B1-75** **Enhanced Safety and Efficiency of Surface Operations (ATSA-SURF)** Airport surface surveillance for ANSP and flight crews with safety logic, cockpit moving map displays and visual systems for taxi operations	**B2-75** **Optimised Surface Routing and Safety Benefits (A-SMGCS Level 3-4, ATSA-SURF IA and SVS)** Taxi routing and guidance evolving to trajectory based with ground / cockpit monitoring and data link delivery of clearances and information. Cockpit synthetic visualisation systems	
B0-80 **Improved Airport Operations through Airport-CDM** Airport operational improvements through the way operational partners at airports work together	**B1-80** **Optimised Airport Operations through Airport-CDM** Airport operational improvements through the way operational partners at airports work together		
	B1-81 **Remote Operated Aerodrome Control Tower** Remotely operated Aerodrome Control Tower contingency and remote provision of ATS to aerodromes through visualisation systems and tools		

Performance Improvement Area 2:
Globally Interoperable Systems and Data – Through Globally Interoperable System Wide Information Management

Block 0	Block 1	Block 2	Block 3
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 ICAO Document 9694	**B1-25** **Increased Interoperability, Efficiency and Capacity though FF-ICE/1 application before Departure** Introduction of FF-ICE step 1, to implement ground-ground exchanges using common flight information reference model, FIXM, XML and the flight object used before departure	**B2-25** **Improved Coordination through multi-centre Ground-Ground Integration: (FF-ICE/1 and Flight Object, SWIM)** FF-ICE supporting trajectory-based operations through exchange and distribution of information for multicentre operations using flight object implementation and IOP standards	
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	**B1-30** **Service Improvement through Integration of all Digital ATM Information** Implementation of the ATM information reference model integrating all ATM information using UML and enabling XML data representations and data exchange based on internet protocols with WXXM for meteorological information		**B3-25** **Improved Operational Performance through the introduction of Full FF-ICE** All data for all relevant flights systematically shared between air and ground systems using SWIM in support of collaborative ATM and trajectory-based operations
	B1-31 **Performance Improvement through the application of System Wide Information Management (SWIM)** Implementation of SWIM services (applications and infrastructure) creating the aviation intranet based on standard data models, and internet-based protocols to maximise interoperability	**B2-31** **Enabling Airborne Participation in collaborative ATM through SWIM** Connection of the aircraft an information node in SWIM enabling participation in collaborative ATM processes with access to rich voluminous dynamic data including meteorology	
B0-105 **Meteorological Forecasts, Warnings and Alerts**. Global, regional and local meteorological information: • Aerodrome warnings to give concise information of meteorological conditions that could adversely affect all aircraft at an aerodrome including windshear. • Forecasts provided by world area forecast centres (WAFC), volcanic ash advisory centres (VAAC) and tropical cyclone advisory centres (TCAC) This information will support flexible airspace management, improved situational awareness and collaborative decision making, and dynamically-optimized flight trajectory planning.	**B1-105** **Better Operational Decisions through Integrated Weather Information (Strategic >40 Minutes)** Weather information supporting automated decision process or aids involving: weather information, weather translation, ATM impact conversion and ATM decision support		**B3-105** **Better Operational Decisions through Integrated Weather Information (Tactical <40 Minutes)** Weather information supporting both air and ground automated decision support aids for implementing weather mitigation strategies

Performance Improvement Area 3:
Optimum Capacity and Flexible Flights – Through Global Collaborative ATM

Block 0	Block 1	Block 2	Block 3
B0-10 **Improved Operations through Enhanced En-Route Trajectories** To allow the use of airspace which would otherwise be segregated (i.e. military airspace) along with flexible routing adjusted for specific traffic patterns. This will allow greater routing possibilities, reducing potential congestion on trunk routes and busy crossing points, resulting in reduced flight length and fuel burn.	**B1-10** **Improved Operations through Free Routing** Introduction of free routing in defined airspace, where the flight plan is not defined as segments of a published route network or track system to facilitate adherence to the user-preferred profile		
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 way-point or an FIR/sector boundary along the flight, use of miles-in-trail to smooth flows along a certain traffic axis and re-routing of traffic to avoid saturated areas	**B1-35** **Enhanced Flow Performance through Network Operational Planning** ATFM techniques that integrate the management of airspace, traffic flows including initial user driven prioritisation processes for collaboratively defining ATFM solutions based on commercial/operational priorities	**B2-35** **Increased user involvement in the dynamic utilisation of the network.** 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	**B3-10** **Traffic Complexity Management** Introduction of complexity management to address events and phenomena that affect traffic flows due to physical limitations, economic reasons or particular events and conditions by exploiting the more accurate and rich information environment of a SWIM-based ATM

Performance Improvement Area 3:
Optimum Capacity and Flexible Flights – Through Global Collaborative ATM

Block 0	Block 1	Block 2	Block 3
B0-84 Initial Capability for Ground-Based Cooperative Surveillance 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. This capability will be expressed in various ATM services, e.g. traffic information, search and rescue and separation provision.			
B0-85 **Air Traffic Situational Awareness (ATSA)** Two *ATSA (Air Traffic Situational Awareness)* applications which will enhance safety and efficiency by providing pilots with the means to achieve quicker visual acquisition of targets: • AIRB (Enhanced Traffic Situational Awareness during Flight Operations). • VSA (Enhanced Visual Separation on Approach).	**B1-85** **Increased Capacity and Flexibility through Interval Management** Interval Management (IM) improves the management of traffic flows and aircraft spacing. Precise management of intervals between aircraft with common or merging trajectories maximises airspace throughput while reducing ATC workload along with more efficient aircraft fuel burn..	**B2-85** **Airborne Separation (ASEP)** Creation of operational benefits through temporary delegation of responsibility to the flight deck for separation provision between suitably equipped designated aircraft, thus reducing the need for conflict resolution clearances while reducing ATC workload and enabling more efficient flight profiles.	**B3-85** **Self-Separation (SSEP)** To create operational benefits through total delegation of responsibility to the flight deck for separation provision between suitably equipped aircraft in designated airspace, thus reducing the need for conflict resolution clearances while reducing ATC workload and enabling more efficient flight profiles
B0-86 **Improved access to Optimum Flight Levels through Climb/Descent Procedures using ADS-B** This prevents an aircraft being trapped at an unsatisfactory altitude and thus incurring non-optimal fuel burn for prolonged periods. The main benefit of ITP is significant fuel savings and the uplift of greater payloads			
B0-101 **ACAS Improvements** To provide short term improvements to existing airborne collision avoidance systems (ACAS) to reduce nuisance alerts while maintaining existing levels of safety. This will reduce trajectory perturbation and increase safety in cases where there is a breakdown of separation.		**B2-101** **New Collision Avoidance System** Implementation of Airborne Collision Avoidance System (ACAS) adapted to trajectory-based operations with improved surveillance function supported by ADS-B aimed at reducing nuisance alerts and deviations. The new system will enable more efficient operations and procedures while complying with safety regulations	
B0-102: Increased Effectiveness of Ground-based Safety Nets This module provides 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).	**B1-102: Increased Effectiveness of Ground-based Safety Nets** This module enhances the safety provide by the previous module by reducing the risk of controlled flight into terrain accidents on final approach through the use of Approach Path Monitor (APM).		

Performance Improvement Area 4:
Efficient Flight Path – Through Trajectory-based Operations

Block 0	Block 1	Block 2	Block 3
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)	**B1-05** **Improved Flexibility and Efficiency in Descent Profiles (OPDs)** 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 Optimized Profile Descents (OPDs)	**B2-05** **Optimized arrivals in dense airspace.** Deployment of performance based airspace and arrival procedures that optimize the aircraft profile taking account of airspace and traffic complexity including Optimized Profile Descents (OPDs), supported by Trajectory-Based Operations and self-separation	
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	**B1-40** **Improved Traffic Synchronisation and Initial Trajectory-Based Operation.** Improve the synchronization of traffic flows at en-route merging points and to optimize the approach sequence through the use of 4DTRAD capability and airport applications, e.g.; D-TAXI, via the air ground exchange of aircraft derived data related to a single controlled time of arrival (CTA).		**B3-05** **Full 4D Trajectory-based Operations** Trajectory-based operations deploys an accurate four-dimensional trajectory that is shared among all of the aviation system users at the cores of the system. This provides consistent and up-to-date information system-wide which is integrated into decision support tools facilitating global ATM decision-making
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)			
	B1-90 **Initial Integration of Remotely Piloted Aircraft (RPA) Systems into non-segregated airspace** Implementation of basic procedures for operating RPAs in non-segregated airspace including detect and avoid	**B2-90** **RPA Integration in Traffic** Implements refined operational procedures that cover lost link (including a unique squawk code for lost link) as well as enhanced detect and avoid technology	**B3-90** **RPA Transparent Management** RPA operate on the aerodrome surface and in non-segregated airspace just like any other aircraft