International Civil Aviation Organization

MIDANPIRG/23 & RASG-MID/13 Meetings

(Cairo, Egypt, 14 – 18 May 2026)

Agenda Item 5.3: AIM

OUTCOMES OF THE AIM SG/12 MEETING

(Presented by the Secretariat)

SUMMARY

This paper presents the outcomes of the AIM SG/12 meeting and the AIM/SWIM Developments in the MID Region.

Action by the meeting is at paragraph 3

REFERENCE

- Report of MIDANPIRG/22 & RASG-MID/12
- Reports of MID AIM SG/12 and AIMDPTF/2

1. INTRODUCTION

1.1 The Twelfth meeting of the Aeronautical Information Management Sub-Group (AIM SG/12) and the Second Meeting of the AIM Digitalization and Planning Task Force (AIMDP TF/2) were held virtually during 21 - 23 April 2026. The meetings were attended by a total of sixty-two (62) participants from Ten (10) States (Bahrain, Egypt, Iraq, Jordan, Libya, Oman, Qatar, Saudi Arabia, Syria and UAE) and Two (2) Organizations/Industries (ADL and IATA).

1.2 The AIM SG/12 meeting reviewed the outcomes of AIMDP TF/2 and progress on AIM implementation across the MID Region and addressed a wide range of operational, technical, and strategic subjects relevant to the advancement of AIM/SWIM in the MID Region.

2. DISCUSSION

GLOBAL & REGIONAL DEVELOPMENTS

2.1 The AIM SG/12 meeting was apprised of the significant developments at the global level, including the outcomes of the three most recent meetings of the ICAO Information Management Panel Working Group A (IMP/WG-A/20, IMP/WG-A/21, and IMP/WG-A/22), held since July 2025. Key areas addressed included the Digital Operational Reporting Information Service (DORIS), digital aeronautical data sets, global AIM implementation support, the future of aeronautical charting, and consequential amendments to Annex 4, Annex 15, and PANS-AIM.

2.2 The meetings were briefed on the Eighth Edition of the Global Air Navigation Plan (GANP, 2025), with particular focus on updates to the Digital Aeronautical Information Management (DAIM) thread within the ASBU framework, including the deferral of certain DAIM elements, revisions to maturity levels, and the integration of automation and machine learning into the updated DAIM thread.

2.3 The meeting noted that the Fourteenth Air Navigation Conference (AN-Conf/14, Montréal, August–September 2024) recommended the global transition to FF-ICE services and the cessation of the ICAO 2012 Flight Plan by 31 December 2034, identifying SWIM and FF-ICE as the foundational building blocks of the future ATM system. The 42nd Session of the ICAO Assembly (A42, September–October 2025) endorsed this direction through Resolution A42-9, requesting ICAO to incorporate service-oriented architecture principles into the GANP and to develop globally unified SWIM implementation guidelines. These global mandates establish a clear and binding trajectory: SWIM is the delivery mechanism, FF-ICE is the operational outcome, and 2034 is the globally agreed deadline.

2.4 At the Regional level, the following upcoming events relevant to AIM and SWIM in the MID Region were noted:

- the ICAO EUR/NAT–MID Seminar on SWIM (Tbilisi, 23–25 June 2026); and
- the Joint ICAO/IATA/Data Houses AIM-ing for Excellence Workshop (Cairo, 4-7 October 2026).

2.5 States were strongly encouraged to ensure the active participation of relevant AIM professionals in these events.

ACR/PCR PUBLICATION STATUS

2.6 The meeting recalled that the ACR-PCR method became mandatory on 28 November 2024, replacing ACN-PCN, pursuant to Amendment 15 to Annex 14, Volume I, and MIDANPIRG/22 Conclusion 22/22. An AIP review revealed that only Jordan, Kuwait, Qatar, Saudi Arabia and UAE have published PCR information in their AIP. Egypt has initiated the transition, with PCR data partially published. The remaining nine MID States have yet to publish PCR information, representing a 60% non-compliance rate across the Region. Those States were urged to provide a specific target AIRAC cycle for publication and notify the ICAO MID Office accordingly without further delay.

GNSS AND NAVAID AIP PUBLICATION

2.7 The AIM SG/12 meeting recalled ICAO's Standards and guidance related to the publication of Radio Navigation Aids (NAVAIDs) and GNSS information in States' AIPs, particularly AIP Sections GEN 2.5 (List of Radio Navigation Aids), ENR 4.1 (Radio Navigation Aids — En-route), AD 2.19 (Radio Navigation and Landing Aids), and ENR 4.3 (GNSS), noting the distinction between En-route and Terminal NAVAIDs and their corresponding technical data requirements.

2.8 The meeting noted inconsistencies identified in some MID States' AIPs, including missing technical details, discrepancies between published NAVAIDs and their actual operational use, and inconsistencies between GEN 2.5 and AD 2.19 entries. It was underscored that the publication of harmonized and accurate information on NAVAIDs in the AIPs is crucial for facilitating the implementation of Performance-Based Navigation (PBN), planning for GNSS contingencies, and optimizing navigation infrastructure.

2.9 The meeting urged States to review and harmonize their AIPs, particularly Sections GEN 2.5, ENR 4.1, AD 2.19, and ENR 4.3 (GNSS), to ensure full alignment with ICAO SARPs and associated guidance, and tasked the ICAO MID Regional Office Secretariat to monitor State progress and provide the necessary implementation support.

THE MIDAD PROJECT

2.10 The MID Region AIM Database (MIDAD) Project was established in 2013 under a Memorandum of Agreement to support the AIS-to-AIM transition through a three-phase architecture

(EAD migration, MIDAD Manager, MIDAD system deployment).

2.11 The AIM SG/12 meeting noted that after more than twelve years, progress under Phase A has remained critically limited: only one State has completed EAD migration, with one additional State under ongoing migration. The prerequisite threshold of seven States required to initiate Phase B has not been met, and there is no realistic prospect of it being met in the foreseeable future. Structural barriers include financial constraints, limited technical readiness, and insufficient regional participation.

2.12 The meeting recognized that the MIDAD Project's governance model, financial framework, and three-phase sequential architecture all conceived around a centralized database paradigm have proven structurally unworkable and cannot be adapted to meet the requirements of a modern, service-oriented information management environment.

2.13 The meeting agreed that concluding the MIDAD Project in its current form is the appropriate course of action, and that regional efforts and resources should be reallocated toward the development of a MID Regional SWIM Framework for aeronautical information management. Therefore, the meeting agreed to the following Draft Decision:

DRAFT DECISION 12/1: MIDAD PROJECT

That the MID Region AIM Database (MIDAD) Project be concluded and the MIDAD Task Force be dissolved.

TRANSITION FROM AIS TO AIM AND DIGITALIZATION

2.14 The meeting noted the results of the AIS-to-AIM Transition and AIM Digitalization Maturity Survey, conducted pursuant to State Letter AN 8/4 – 25/201 dated 11 September 2025, as part of the regional readiness assessment and gap analysis activity. The survey achieved a strong response rate of 87%, with 13 out of 15 MID States submitting their responses. The assessment covered ten implementation domains: Basic Building Blocks (BBB), Automation in AIM, Terrain, Obstacles, Electronic AIP (eAIP), Aerodrome Mapping Database (AMDB), Electronic Charting (eCharting), NOTAM, Training, and Briefing.

2.15 The MID Region AIS to AIM Transition Status Report (MID/AIMDP-TF/WS2/001, March 2026) at **Appendix A**, indicates that the MID Region has achieved a regional average AIM implementation rate of 60%, reflecting meaningful progress beyond initial planning stages. However, 40% of the regional implementation programme remains incomplete.

2.16 The distribution of responding States across four implementation maturity levels is summarized in the table below:

Maturity Level	Score Range	MID States	Count
Mature	75% – 100%	Qatar (89%), Saudi Arabia (86%), Bahrain (83%), UAE (82%), Kuwait (78%)	5
Advanced	55% – 74%	Egypt (60%), Sudan (58%), Jordan (55%), Oman (54%)	3
Developing	30% – 54%	Libya (49%), Lebanon (42%), Iraq (36%)	4
Initial	0% – 29%	Syria (1%)	1

2.17 The five States in the Mature band collectively demonstrate that a high level of digital AIM implementation is operationally achievable within the MID Region, and that the necessary governance, institutional, and technical conditions can be successfully established. These States constitute important regional reference cases and potential sources of structured peer support and knowledge transfer to less advanced States.

2.18 The survey revealed a structurally significant gap between strong foundational domains and weak operational service domains:

- Strong domains: BBB (83%), Training (69%), Obstacles (66%), eAIP (65%);
- Moderate domains: Terrain (62%), Automation in AIM (56%), eCharting (56%); and
- Weak domains — critical regional gaps: Digital pre-flight Briefing (50%), AMDB (42%), and NOTAM modernization (41%).

2.19 The structural gap between foundational domain performance (averaging above 65%) and operational service domain performance (averaging below 45%) is the defining characteristic of the Region's current AIM profile and should constitute the primary basis for prioritizing future investment, technical assistance, and regional cooperation.

MID REGION DIGITAL AIM AND SWIM VISION

2.20 The AIM SG/12 endorsed the following Overarching Vision for AIM Planning and Implementation in the MID Region, in fulfilment of a tasking from MIDANPIRG/22, for incorporation into MID Doc 008:

By 2034, the MID Region will have transitioned from a product-centric Aeronautical Information Service (AIS) to a trusted, digital, interoperable, and service-oriented AIM environment. In this environment, aeronautical information is produced, managed, and exchanged as quality-assured, structured digital datasets encoded in ICAO-standard formats across SWIM-enabled information services, supporting seamless, reliable, secure, and efficient exchange of ATM-related information throughout the Region and beyond.

2.21 Central to the realization of this Vision is the full implementation of System-Wide Information Management (SWIM), recognized as an indispensable pillar of the transition to a digital, service-oriented AIM environment. The meeting agreed also that achieving technical interoperability across different SWIM implementations requires the use of standardized interfaces and robust technical infrastructure capable of enabling reliable, secure, and efficient exchange of ATM-related information. In this regard, the meeting agreed that the MID Region SWIM Technical Infrastructure (TI) Profiles must be identified, developed, and agreed upon as a matter of priority. Accordingly, the meeting agreed to the following Draft Decision:

DRAFT DECISION 12/2: SWIM TECHNICAL INFRASTRUCTURE PROFILES

That, the MIDANPIRG CNS SG be tasked to develop the SWIM Technical Infrastructure to be used in the implementation of SWIM in the MID Region.

MID REGION IMPLEMENTATION PLAN FOR DIGITAL DATA SETS

2.22 The AIM SG/12 reviewed the MID Region Implementation Plan for Digital Data Sets (First Edition, 2026) at **Appendix B**, developed by AIMDP TF under the co-leadership of Saudi Arabia and UAE. The Plan constitutes the authoritative regional framework for the structured, harmonized, and timely provision of all five categories of aeronautical digital datasets in full compliance with ICAO SARPs.

2.23 The Plan addresses five digital data set categories, Terrain, Obstacle, AIP, Aerodrome Mapping (AMDB), and Instrument Flight Procedure (IFP) data sets, specifying what digital aeronautical data sets are required, how they should be produced and encoded, and when they should be made available. The meeting endorsed the plan and agreed to the following Draft Conclusion:

DRAFT CONCLUSION 12/3: REGIONAL PLAN FOR THE PROVISION OF DIGITAL DATA SETS

That:

a) the MID Region Implementation Plan for the Provision of Digital Data Sets (First Edition, 2026) be endorsed and published on the ICAO MID Office website; and

b) MID States be urged to develop and submit a National Digital Data Set Implementation Plan (NDIP), prepared using the standardized Template provided in Appendix B of the Plan, to the ICAO MID Office no later than 31 December 2026, and to submit annual progress updates thereafter.

AIM-ING FOR EXCELLENCE WORKSHOP

2.24 The AIM SG/12 noted the successful outcomes of the Joint ICAO/IATA/Jeppesen AIM-ing for Excellence Workshop (Cairo, 10–12 November 2025). A follow-on Joint ICAO/IATA/Data Houses AIM-ing for Excellence Workshop is scheduled in Cairo from 4 to 7 October 2026. States were strongly encouraged to ensure participation of relevant AIM professionals, including data originators.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) take note of the outcomes of AIM SG/12 meeting; and

b) endorse the Draft Conclusion and Decisions.

APPENDIX A

AIS to AIM Transition and Digitalization Status Report

Document Reference: MID/AIMDP-TF/WS2/001

Edition: First Edition

Date: March 2026

Prepared by: ICAO MID Regional Office & AIMDP Task Force, Workstream 2

Document History

Version	Date	Description
1.0	March 2026	Initial edition based on 13 State survey responses

Table of Contents

List of Abbreviations

Abbreviation	Meaning
AIM	Aeronautical Information Management
AIMDP TF	AIM Digitalization and Planning Task Force
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulation and Control
AIS	Aeronautical Information Services
AISP	Aeronautical Information Service Provider
AMDB	Aerodrome Mapping Database
AIXM	Aeronautical Information Exchange Model
BBB	Basic Building Block
eAIP	Electronic Aeronautical Information Publication
GANP	Global Air Navigation Plan
GATMOC	Global Air Traffic Management Operational Concept
ISO	International Organization for Standardization
KPI	Key Performance Indicator
MID	Middle East
MIDANPIRG	Middle East Air Navigation Planning and Implementation Regional Group
NOTAM	Notice to Airmen
SWIM	System Wide Information Management
WS2	Workstream 2

Executive Summary

This report presents a comprehensive assessment of the transition from Aeronautical Information Services (AIS) to Aeronautical Information Management (AIM) across the ICAO MID Region, together with an evaluation of the digitalization maturity of key AIM milestones. The analysis is based on structured self-assessment responses from 13 of the 15 MID States, representing 87 percent regional response rate, and covers ten implementation areas: the Basic Building Block (BBB) framework, automation in AIM, terrain data, obstacle data, electronic AIP (eAIP), Aerodrome Mapping Database (AMDB), electronic charting, NOTAM, training, and aeronautical information briefing.

At regional level, the MID Region has achieved an average overall implementation level of 59 percent. This result indicates that the region has progressed beyond foundational compliance but has not yet achieved consistent operational digital maturity across all implementation areas. Progress is strongest in the BBB domain (83 percent), training (69 percent), obstacle data (66 percent), and eAIP (65 percent). The most significant regional gaps remain in digital NOTAM (41 percent), AMDB (42 percent), briefing automation (50 percent), and end-to-end AIM automation (56 percent).

The results reveal a region of significant maturity variation. Five States are assessed as mature (Qatar at 89 percent, KSA at 86 percent, Bahrain at 83 percent, UAE at 82 percent, and Kuwait at 78 percent). Four States are assessed as advanced (Egypt at 60 percent, Sudan at 58 percent, Jordan at 55 percent, and Oman at 54 percent). Three States are in the developing category (Libya at 49 percent, Lebanon at 42 percent, and Iraq at 36 percent). One State, Syria, remains at an initial stage (1 percent), reflecting the exceptional circumstances prevailing in that State.

This distribution confirms that the MID Region possesses credible implementation experience and several high-performing reference cases. However, regional harmonization continues to be constrained by uneven national capability, differing levels of automation, and the incomplete operationalization of digital products and data exchange mechanisms.

Key regional messages

Foundational compliance is broadly established. The majority of responding States have an Aeronautical Information Service Provider (AISP) designated, regulatory arrangements in place, AIRAC discipline maintained, and a quality management framework operational.

The transition remains uneven within the data chain. Advanced publication capability in some States is not matched regionally by equivalent readiness for AMDB, digital briefing, or automated exchange with data originators and end users.

The next phase for the region is not only additional compliance, but greater harmonization, automation, and operational usability of digital AIM outputs.

1. Introduction & Scope

1.1. Background:

Since the early 2000s, the aeronautical information domain has been undergoing a fundamental transition from the provision of traditional, paper-based aeronautical information services toward the management and digital delivery of aeronautical data and information. Accelerating this transition is essential to fully realize the vision of the Global Air Traffic Management Operational Concept (GATMOC), as defined in ICAO Doc 9854. Within that vision, AIM operationalizes the information pillar by providing standardized, digital, and interoperable aeronautical data that enables efficient, collaborative, and trajectory-based air traffic management in support of the ICAO Global Air Navigation Plan (GANP, Doc 9750).

In the ICAO MID Region, the AIM Digitalization Programme Task Force (AIMDP TF) was established under MIDANPIRG to drive and harmonize the deployment of digital AIM across the region, while addressing key priority areas to achieve a more uniform and efficient aeronautical information management environment. The AIMDP TF operates through five prioritized workstreams, each led by designated State champions and aligned with phased deliverables. Workstream 2 (WS2), co-led by Oman and the ICAO MID Regional Office, is responsible for the Readiness Assessment Framework, with the mandate to develop a gap-analysis methodology framework and produce State-level gap analysis reports.

In fulfilment of this mandate, the ICAO MID Regional Office issued a structured survey to all MID States on 11 September 2025 (SL Ref.: AN 8/4 – 25/201), requesting States to provide a self-assessment of their progress in AIM digitalization and the transition from AIS to AIM. Responses were received from 13 States by the time of analysis.

The present report is designed to provide an evidence-based snapshot of current regional implementation status, identify areas of strength and weakness, and support regional discussion on priorities for the next stage of implementation. The report describes where the MID Region stands as of early 2026.

1.2. Objective

The objective of this report is to assess the current status of the AIS to AIM transition and AIM digitalization across the ICAO MID Region, in order to identify implementation progress, maturity levels, systemic gaps, and cross-cutting issues that may affect regional harmonization and operational interoperability.

1.3. Scope

- **Geographical scope:** All responding States from the ICAO MID Region (13 States). Iran and Yemen are not represented due to the absence of responses at the time of analysis.
- **Subject scope:** Governance and compliance foundations, automation, core digital data sets, digital products and services, training, and aeronautical information briefing.
- **Analytical scope:** Regional trends, implementation maturity by State, implementation maturity by domain, and qualitative interpretation of key challenges and support needs.
- **Regulatory reference:** The assessment framework is aligned with ICAO Annex 15 (Aeronautical Information Services), PANS-AIM (Doc 10066), Doc 8126 (Aeronautical Information Services Manual and relevant ICAO guidance.

- **Disclaimer:** The report does not attribute underperformance to any State individually. Results are presented for regional planning purposes and to support a strategy and roadmap towards a vision for Aeronautical Information Management based on a harmonized and digitised AIS.

2. Methodology

The analysis draws upon four primary sources: the official survey issuance letter from the ICAO MID Regional Office (SL Ref.: AN 8/4 – 25/201); the structured survey questionnaire; the individual State response workbooks submitted by 13 responding States; and the initial draft results compilation prepared from the survey data. Iran and Yemen are not represented in the analysis as no response was received from either State within the analysis period.

The survey framework covered ten implementation areas and incorporated both quantitative scoring and qualitative questions. Quantitative results were aggregated to derive completion percentages by State and by implementation area. Qualitative responses were reviewed to identify common implementation barriers, enabling factors, and support requirements.

Source	Purpose in this report	Use
Survey letter	Defines official regional context and action requested	Background and methodology
Questionnaire structure	Defines implementation areas and detailed indicators	Analytical framework
State response workbooks	Primary evidence base	Scoring, readiness indicators, and qualitative observations
Initial draft results report	Consolidates charts and aggregate percentages	Cross-checking and presentation baseline

2.1 Maturity model used in this report

To facilitate interpretation of the regional picture, the report classifies overall State performance into four maturity levels:

Level	Range	Interpretation
Initial	0 – 25%	Foundational structures not yet broadly in place; substantial support required
Developing	26 – 50%	Partial implementation visible but uneven across domains
Advanced	51 – 75%	Key structures established with operational capability in several domains; gaps remain in specific higher-complexity areas
Mature	76 – 100%	Broad-based implementation across most domains; selective remaining gaps

These classifications serve as analytical reference points for regional discussion. They do not constitute formal ICAO compliance determinations and are not intended to replace any ICAO Universal Safety Oversight Audit Programme (USOAP) findings.

2.2 Limitations

The survey is based on State self-assessment and therefore reflects the level of detail and interpretation provided by each individual respondent. Independent verification of reported scores was not undertaken as part of this exercise.

The survey provides strong visibility over implementation status indicators, but offers more limited direct evidence on certain advanced operational topics, such as full SWIM service operationalization, end-to-end data service consumption, and actual data quality performance.

States with equal overall completion percentages may represent significantly different underlying operational realities. The maturity levles and aggregate scores should therefore be interpreted in conjunction with the domain-level detail provided in Annexes B and C.

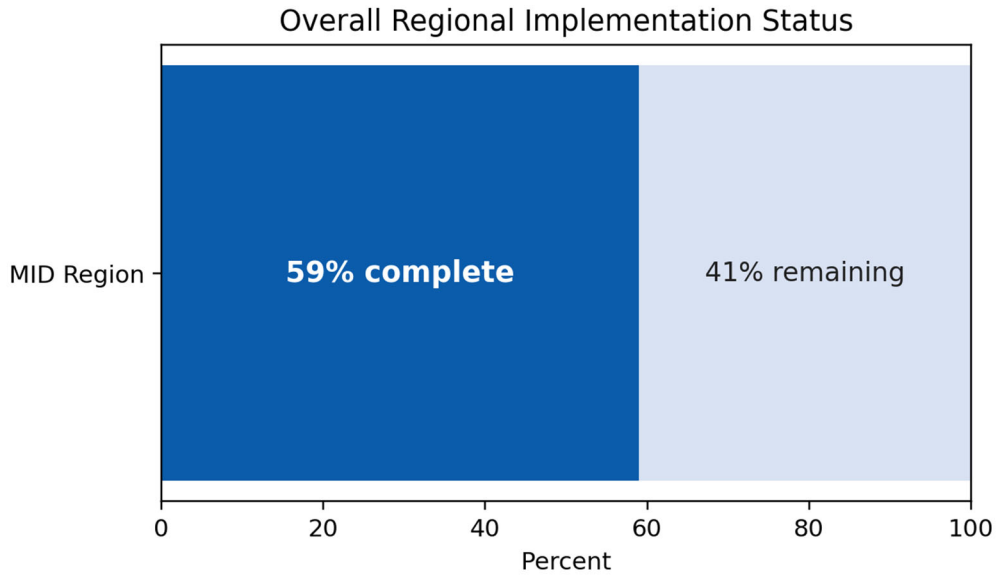
The response rate of 87 percent (13 of 15 MID States) is considered representative for regional planning purposes. However, the absence of responses from Iran and Yemen means that the regional picture is incomplete with respect to geographic coverage.

3. Analysis

3.1 Regional overview

The regional average of 59 percent confirms that the MID Region is actively in transition, but has not yet reached a state of consistent operational digital AIM maturity, as illustrated in Figure 1. The strongest results are concentrated in foundational and compliance-related domains. The BBB reaches 83 percent, reflecting that the majority of responding States have established core AIS structures, AIRAC arrangements, and baseline governance frameworks in accordance with ICAO Annex 15. Training at 69 percent indicates that many States have at least a basic training framework in place, although the depth and institutional sustainability of training arrangements remains uneven.

Data set-related implementation is mixed. Obstacle data (66 percent) and terrain data (62 percent) show moderate progress, suggesting that a substantial number of States have begun building the underlying digital data environment necessary to support AIM evolution. The eAIP result of 65 percent also indicates that the region is advancing from traditional product-centric publication toward more structured digital publication. However, AMDB remains at only 42 percent, confirming that airport-surface digitalization, a prerequisite for more advanced collaborative operations and surface data use cases, has not yet been broadly established.



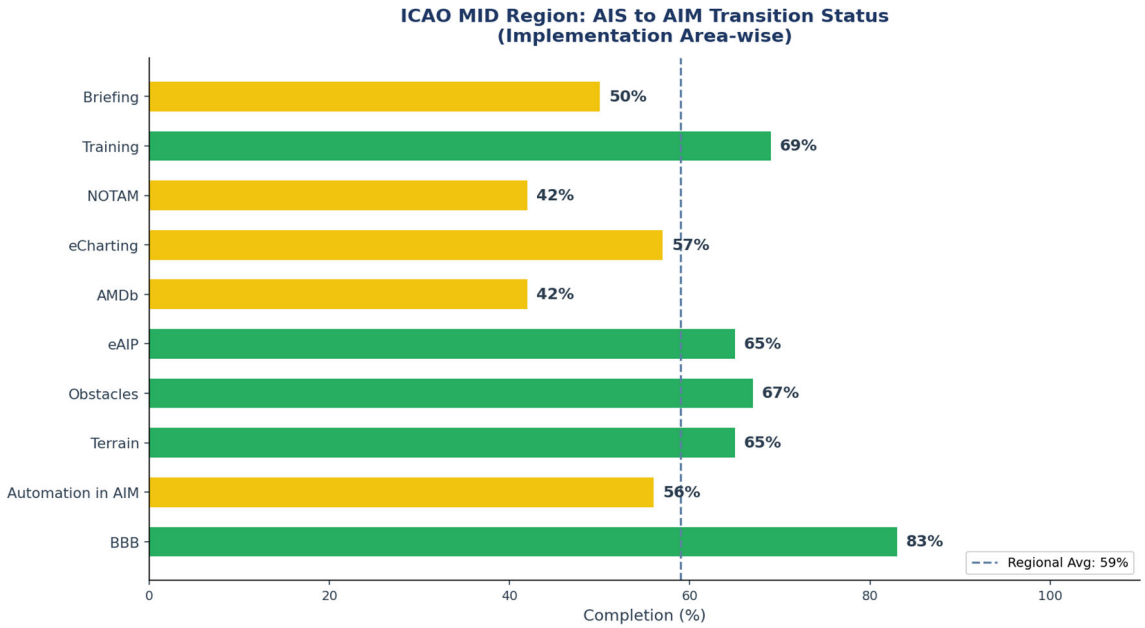


Figure 1. Regional performance by implementation area

3.2 State maturity distribution

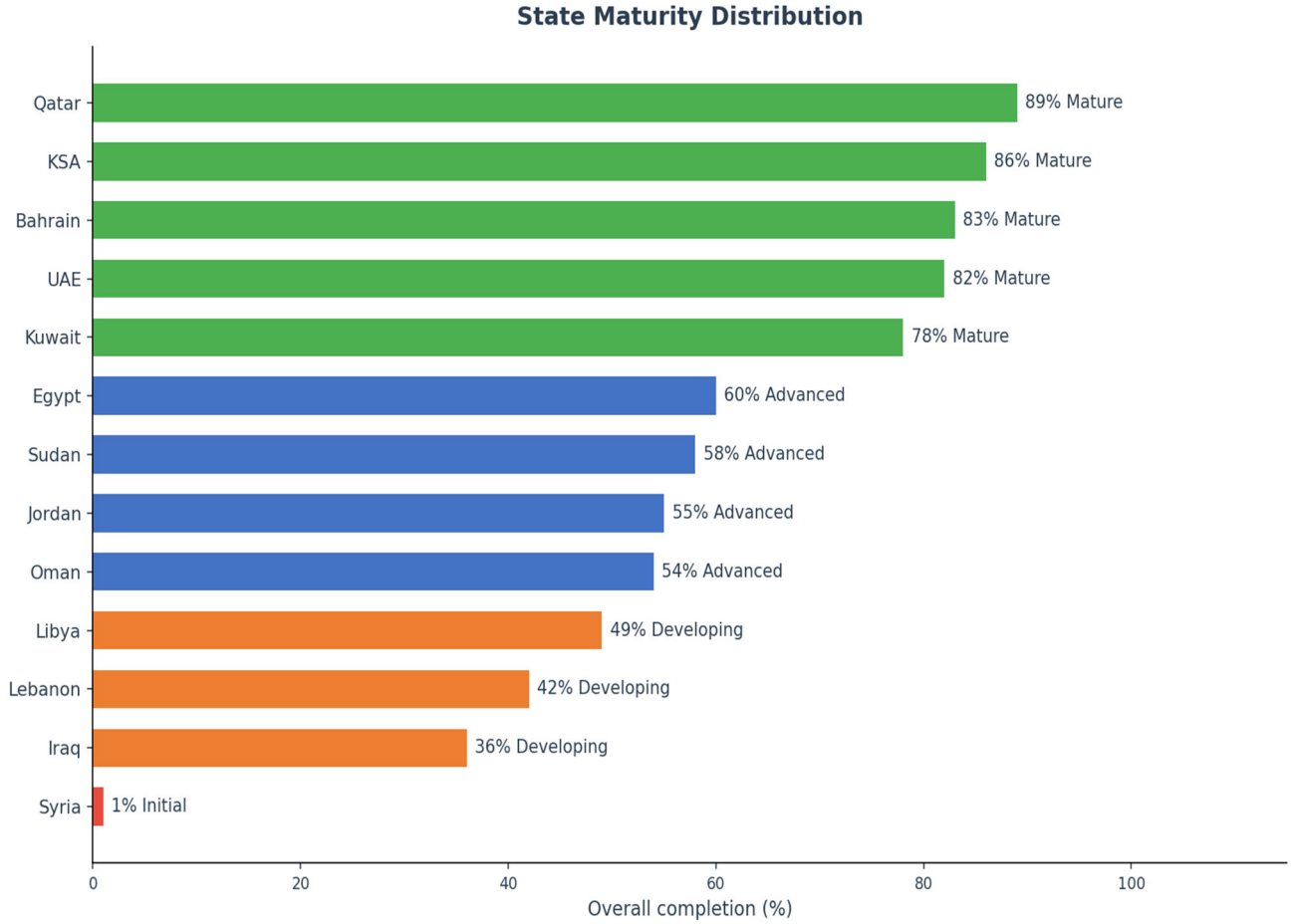


Figure 2. Overall State maturity distribution

Five States are assessed as mature overall: Qatar (89 percent), KSA (86 percent), Bahrain (83 percent), UAE (82 percent), and Kuwait (78 percent). These States demonstrate broad-based implementation across the majority of survey areas and represent the leading reference cases within the region. Their performance confirms that the MID Region already contains practical examples of mature digital AIM transition that can be leveraged for regional learning and peer support.

Four States are assessed as advanced: Egypt (60 percent), Sudan (58 percent), Jordan (55 percent), and Oman (54 percent). These States have established key enabling structures and demonstrated capability across several digital domains, but continue to show gaps in specific higher-complexity areas such as AMDB or briefing automation.

Three States fall in the developing category: Libya (49 percent), Lebanon (42 percent), and Iraq (36 percent). In these cases, implementation is visible but structurally uneven.

One State, Syria (1 percent), remains at an initial stage. The exceptionally low score across all implementation areas reflects the prevailing operational and institutional circumstances in that State and should be treated separately in regional planning, with appropriate support pathways tailored to national conditions.

Maturity Level	Range	States
Mature	76–100%	Qatar, KSA, Bahrain, UAE, Kuwait
Advanced	51–75%	Egypt, Oman, Sudan, Jordan
Developing	26–50%	Libya, Lebanon, Iraq
Initial	0–25%	Syria

3.3 Detailed interpretation by implementation theme

3.3.1 Governance, compliance and institutional foundations

The BBB domain is the strongest regional result at 83 percent. This indicates that, across most responding States, the transition from AIS to AIM is being built on an established base of regulatory oversight, defined service provision responsibilities, AIRAC adherence, and core quality management arrangements consistent with ICAO Annex 15 and Doc 8126. The survey responses confirm that 11 States reported a quality management system in place, of which 8 indicated ISO certification. Additionally, 8 States reported that formal arrangements with data originators or other AISPs had been established, while 3 reported such arrangements to be in progress.

This strong governance baseline is strategically significant. The region is not commencing from a position without established foundations; rather, many States already possess the institutional framework required to underpin more advanced digitalization. However, material gaps persist. The uneven status of formal data originator arrangements, the presence of non-certified quality management systems in several States, and the continued impact of resource-related implementation barriers indicate that baseline governance does not yet guarantee a uniformly digital and reliable data chain across the region.

3.3.2 Automation, data-centric AIM, and interoperability

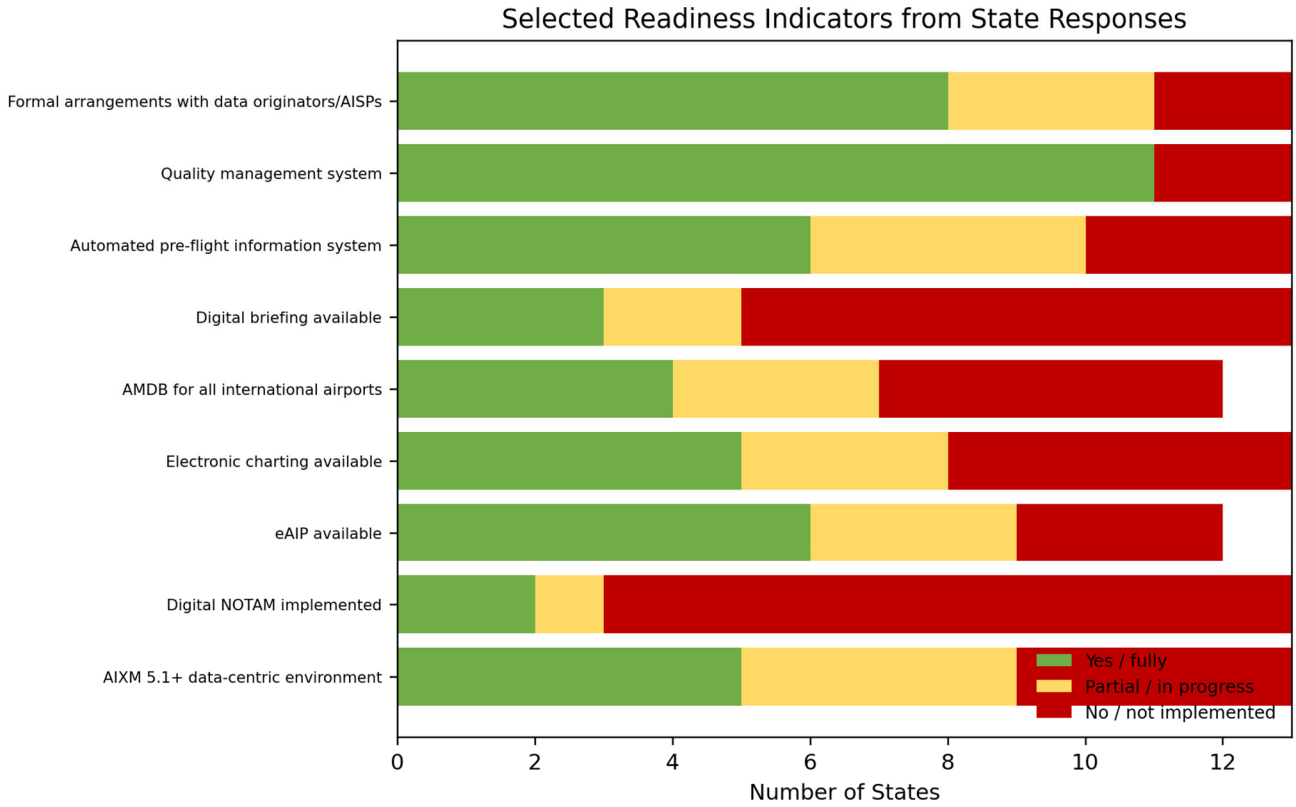


Figure 3. Selected readiness indicators derived from State responses

Automation in AIM averages 56 percent across the region and exhibits the most pronounced disparity between leading and lagging States. The indicator on migration to an AIXM 5.1+ data-centric environment is particularly informative: 5 States reported full implementation, 4 reported partial implementation, and 4 reported that such an environment has not yet been established. This confirms that the region is progressing toward data-centric AIM but has not yet achieved consistent implementation.

In operational terms, the results indicate that the MID Region currently contains three distinct implementation groups: a first group already operating in, or approaching, a modern automated environment consistent with ICAO digital AIM standards; a second group in partial transition with key system components in place but not yet fully operational; and a third group still relying largely on manual or fragmented processes. This disparity is one of the primary constraints on regional harmonization, since digital interoperability depends not only on national progress within individual States but on compatible maturity across the broader information chain.

Qualitative responses reinforce this interpretation. States identified the following barriers to automation progress: limited availability of source data in formats suitable for AIXM-based processing; absence of automated interfaces with data originators; insufficient technical capacity and trained personnel; requirements for SWIM-related infrastructure investment; and cybersecurity considerations for two-way data exchange. These findings confirm that achieving automation maturity is not simply a system procurement challenge, it requires a coordinated approach encompassing data readiness, technical architecture, workforce development, and institutional coordination with multiple stakeholders.

3.3.3 Digital data sets and publication products

The regional picture for digital data sets is mixed. Terrain (62 percent) and obstacle (66 percent) data show moderate to satisfactory progress, suggesting that a significant number of States have invested in the foundational datasets that underpin AIM digitalization and support safety-critical applications including instrument flight procedure design and flight planning. The eAIP result of 65 percent. with 6 States reporting eAIP availability and 3 reporting partial availability, indicates visible modernization in aeronautical publication, consistent with the ICAO roadmap for structured digital publication under Annex 15.

AMDB, however, remains one of the weakest regional domains at 42 percent. Only 4 States reported AMDB available for all international airports, 3 reported partial coverage, and 5 reported that this capability is not yet in place. This indicates that while the region has made progress on broader data set concepts, airport-surface digitalization represents a persistent and substantial implementation challenge. In operational terms, this constrains readiness for advanced airport collaborative operations, surface movement data use cases, and future digital information services reliant on high-resolution airport spatial data.

Electronic charting at 55 percent presents a similarly mixed picture. Five States reported eCharting availability, five reported non-availability, and three reported partial availability. Chart modernization is therefore underway but not yet regionally stable, and the co-existence of digital and conventional charting modes across the region reduces consistency in product delivery and downstream data use.

3.3.4 NOTAM modernization, briefing, and operational use

The NOTAM domain is the weakest performing implementation area at 41 percent. The direct survey response is unambiguous: only 2 States reported full implementation of digital NOTAM, 1 reported partial implementation, and 10 reported that digital NOTAM has not yet been implemented. This represents the most critical gap identified in the survey from the perspective of operational AIM digitalization.

The significance of this finding extends beyond the NOTAM domain itself. NOTAM serves as the primary conduit between static aeronautical data, dynamic operational change, and end-user consumption. Low digital NOTAM maturity means that even where States have achieved advanced capability in publication or data management, the transition to machine-readable, service-oriented operational information remains incomplete. The consequence is continued dependency on conventional text-based NOTAM workflows, with limited opportunity for automation in pre-flight briefing, intelligent NOTAM filtering, and downstream integration into flight management and air traffic management systems.

The briefing domain supports the same conclusion at 50 percent. Only 3 States reported digital aeronautical information briefing as available, 2 reported partial implementation, and 8 reported that digital briefing is not yet available. Although 6 States reported an automated pre-flight information system in place and 4 reported such capability in progress, the overall regional result confirms that automated operational use of digital AIM outputs is advancing more slowly than publication-side capability. This represents a structural gap in the AIM value chain, the benefits of digital data management are not yet being fully delivered to end users in an operationally efficient form.

3.3.5 Training and implementation sustainability

Training is one of the region's relatively stronger domains at 69 percent. However, the survey data indicates that this result should not be interpreted as confirmation of a fully secure or sustainable implementation base. Eight States reported an established AIS/AIM training manual, while 3 reported

none and 2 reported partial status. Only 6 States reported a formal agreement with a recognized training organization. This indicates that while the region has acknowledged the importance of human capability development, institutionalized arrangements for sustained AIM training are not yet universally established.

This assessment is consistent with the support requests received through the survey. Technical workshops and targeted AIM training were the most frequently requested forms of external support. Respondents also expressed needs for peer-State knowledge sharing, structured guidance on newer ICAO digital requirements, and practical implementation assistance. In summary, training represents both a comparative regional strength and a continuing dependency that must be structurally addressed to sustain the pace and quality of AIM digitalization.

3.4 State group observations

Mature States demonstrate a pattern of broad implementation across governance, digital publication, and automation domains, with selective remaining gaps frequently concentrated in AMDB or specific operational digital services such as digital NOTAM or eCharting. These States represent the most valuable regional reference cases and can provide practical implementation experience for regional workshops, peer support programmes, and knowledge-sharing initiatives facilitated by the AIMDP TF.

Advanced States have established credible governance foundations and demonstrated visible progress across multiple domains, but continue to exhibit critical gaps in one or more higher-complexity areas. Their primary near-term implementation gains are likely to come from targeted investment in digital NOTAM, AMDB, briefing automation, and structured data exchange with originators and end users.

Developing States show structurally uneven performance profiles, frequently with acceptable or strong results in one or two domains alongside significant shortfalls in others. For these States, a sequenced implementation approach, addressing foundational capabilities before progressing to more complex digital services, is likely to be more effective and sustainable than attempting concurrent progress across all ten domains.

The initial-stage result for Syria demonstrates clearly that a uniform regional implementation strategy would be insufficient. Regional planning must therefore combine harmonized objectives and timelines with differentiated support pathways that reflect the specific starting points and national circumstances of each State group.

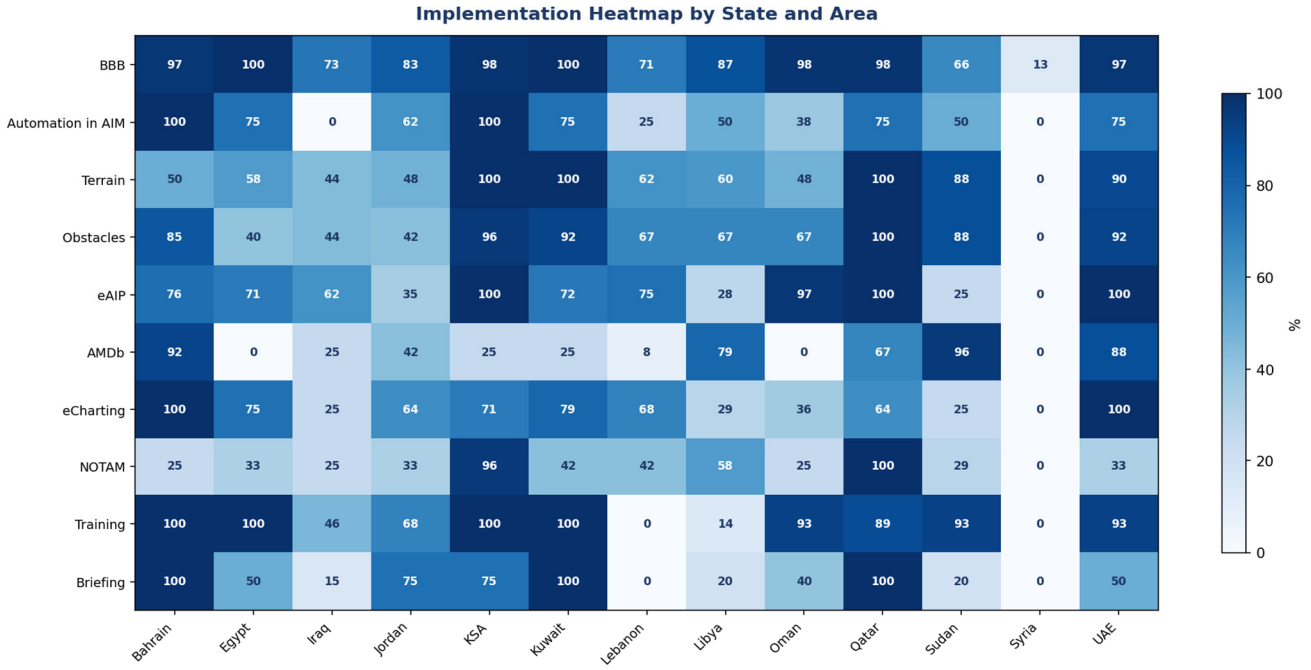


Figure 4. Implementation heatmap by State and implementation area

4. Gap Analysis

The survey results reveal a consistent regional pattern: governance and basic compliance are considerably more advanced than digital operationalization. The following gaps are assessed as the most material from a regional transition and harmonization perspective.

Gap	Evidence from the survey	Regional implication
Digital NOTAM maturity remains low	Only 2 States reported implementation, 1 partial, 10 not implemented	Continued dependence on conventional NOTAM workflows; limited readiness for machine-readable dynamic information and downstream automation
AMDB deployment is uneven and incomplete	Regional average 42%; only 4 States reported AMDB available for all international airports	Limits advanced airport-surface digitalization and constrains future digital service use cases and collaborative airport operations
Automation is not regionally harmonized	AIXM 5.1+ data-centric environment reported as fully implemented in 5 States, partially in 4, not implemented in 4	Interoperability and data exchange maturity differ significantly across the region, inhibiting end-to-end digital AIM chains
Digital briefing capability is underdeveloped	Only 3 States reported digital briefing available, with 8 reporting none	End users do not yet consistently benefit from digital AIM outputs in an operationally efficient and machine-readable form
Institutional capability remains uneven	States consistently cited funding constraints, technical capacity deficits, staffing shortages, guidance gaps, and training needs as barriers	Implementation pace and sustainability may remain inconsistent unless structural capacity constraints are systematically addressed

4.1 Root-cause observations

A synthesis of the qualitative survey responses reveals that the key barriers to AIM digitalization in the MID Region are multidimensional in nature:

Financial and procurement constraints: Funding limitations and associated procurement delays were the most recurrently cited barriers across all State groups, including several States in the developing and advanced categories.

Technical capacity and human resources: Multiple States reported insufficient specialist technical capacity, a shortage of trained AIM digitalization staff, and the need for practical guidance on implementing newer ICAO digital requirements, including AIXM, SWIM, and structured eAIP production.

Data readiness and interface requirements: Several States identified the limited availability of source data in AIXM-compatible formats, the absence of automated interfaces with aeronautical data originators, and insufficient data chain governance as significant constraints on digitalization progress.

Infrastructure and cybersecurity: Requirements for SWIM-related infrastructure investment and cybersecurity frameworks to support two-way digital data exchange were cited as enabling conditions not yet in place in a number of States.

Collectively, these findings confirm that the principal barriers to AIM digitalization are not exclusively technical in nature. They encompass sequencing and prioritization decisions, coordination with data originators and system integrators, access to implementation guidance, and the institutional capacity required to convert system acquisition into operationally sustainable, high-quality digital AIM delivery.

5. Conclusions

The ICAO MID Region has established a credible and measurable foundation for the transition from AIS to AIM. The regional average of 59 percent, supported by the presence of five mature States and four advanced States, confirms that regional implementation momentum exists and that practical, replicable reference cases are available within the region itself.

However, the transition remains structurally uneven and operationally incomplete. The more advanced elements of the regional implementation picture are concentrated in governance, baseline compliance, and selected publication or data set capabilities. The most critical deficiencies persist precisely in those areas that would convert these foundations into a consistently digital, automated, and operationally useful AIM environment, specifically digital NOTAM, AMDB, automated briefing, and end-to-end AIM automation.

From a regional planning perspective, the central strategic challenge is therefore no longer whether the transition has commenced, it clearly has, and at a meaningful scale in several States. The central challenge is how to reduce the maturity gap between States, how to extend operational digitalization beyond the current leading group, and how to progress from a collection of nationally diverse digital capabilities toward a harmonized, interoperable, and operationally effective regional AIM ecosystem consistent with the ICAO GANP objectives and the MIDANPIRG AIM implementation framework.

6. Recommendations

The following recommendations are proposed in an evidence-based and action-oriented manner, directly derived from the survey findings and calibrated to the current maturity of the MID Region. States and the AIMDP TF are invited to consider these recommendations in the context of MIDANPIRG priorities and the phased workstream deliverables.

No.	Recommendation	Rationale	Suggested Target
1	Prioritize digital NOTAM and operational briefing modernization	Given the low regional maturity in NOTAM and briefing, these domains should receive focused regional attention because they are critical to operational use of digital AIM outputs.	
2	Adopt differentiated regional support pathways	Mature, advanced, developing, and initial-stage States have fundamentally different needs. A tiered support model will improve relevance, efficiency, and outcomes. Applying identical support mechanisms to all States is not effective.	Define tiered support framework under WS4 Capacity-Building Roadmap by mid-2026
3	Strengthen implementation support on AIXM, automation, and data exchange	States require practical guidance on data-centric AIM architecture, AIXM data readiness, automated interfaces with originators, and end-to-end distribution workflows.	WS4 to consider the conduct of dedicated AIXM/automation workshops by 2027
4	Accelerate AMDB and airport-surface data development	AMDB at 42% represents one of the most persistent gaps. Lack of guidance combined with unclear obligations.	AMDB is required when there is an operational need, particularly: Aerodromes where: surface movement operations are complex, or advanced guidance systems are in use, such as: • A-SMGCS • electronic flight bags (EFB) with moving maps • enhanced vision / surface awareness systems AIMDP shall define applicability criteria by mid-2026
5	Institutionalize training and peer learning mechanism	Regional workshops, targeted technical training, and peer exchanges coordinated by mature States through the AIMDP TF would address the most frequently cited support need and build sustainable AIM capability across the region.	Define tiered support framework under WS4 Capacity-Building Roadmap by mid-2026

No.	Recommendation	Rationale	Suggested Target
6	Promote stronger formal arrangements with originators and partner AISPs	Formal data originator agreements are essential to improving data quality, timeliness, and readiness for digital exchange. The current status: • 8 States with arrangements established, • 3 in progress, and • 2 not yet addressed, requires active follow-up.	All States to have formal originator arrangements by 2027
7	Document and disseminate mature State implementation practices as regional reference material	Selected best practices from leading States should be systematically documented and shared through AIMDP TF channels to reduce duplication of effort, increase confidence in implementation pathways, and accelerate progress in developing States.	Develop first set of reference practices by end 2026 for sharing with MID States

Annex A. Participation and regional coverage

Thirteen of the 15 ICAO MID States responded to the survey, representing an 87 percent response rate. The responding States are: Bahrain, Egypt, Iraq, Jordan, KSA, Kuwait, Lebanon, Libya, Oman, Qatar, Sudan, Syria, and UAE. Iran and Yemen were not included in the analysis as no response was received from either State within the analysis period.

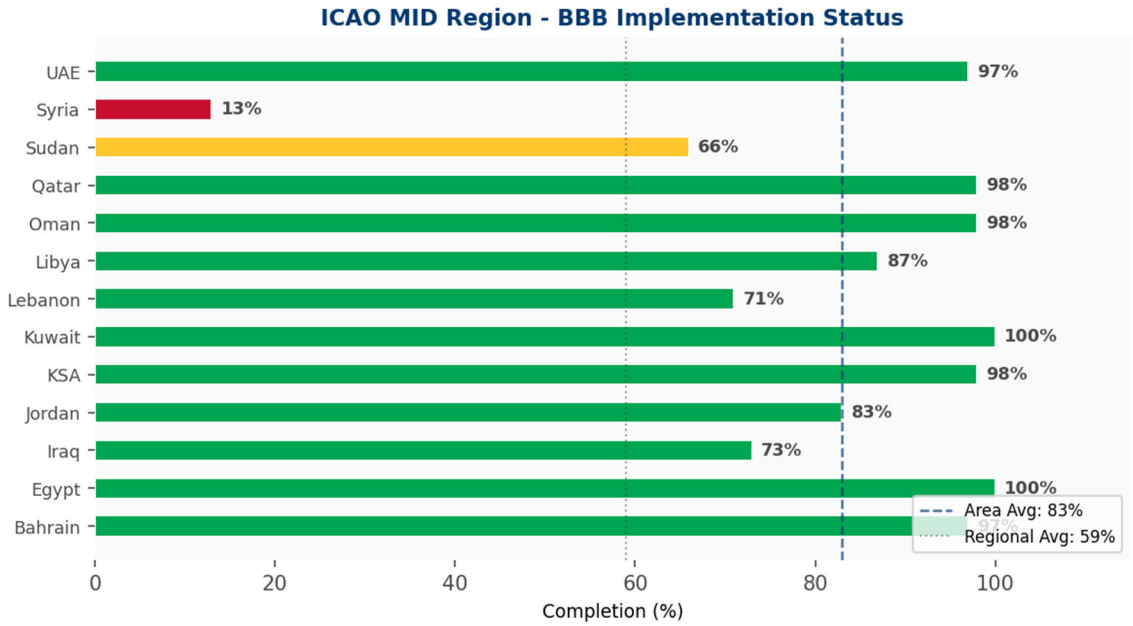
State	Overall completion	Maturity level
Qatar	89%	Mature
KSA	86%	Mature
Bahrain	83%	Mature
UAE	82%	Mature
Kuwait	78%	Mature
Egypt	60%	Advanced
Sudan	58%	Advanced
Jordan	55%	Advanced
Oman	54%	Advanced
Libya	49%	Developing
Lebanon	42%	Developing
Iraq	36%	Developing
Syria	1%	Initial
Regional Average	**59%**	**Advanced**

Annex B. Implementation Area-wise Status

This annex presents the AIS to AIM transition completion status for each of the ten implementation areas, including per-State scores and regional averages.

B.1 BBB

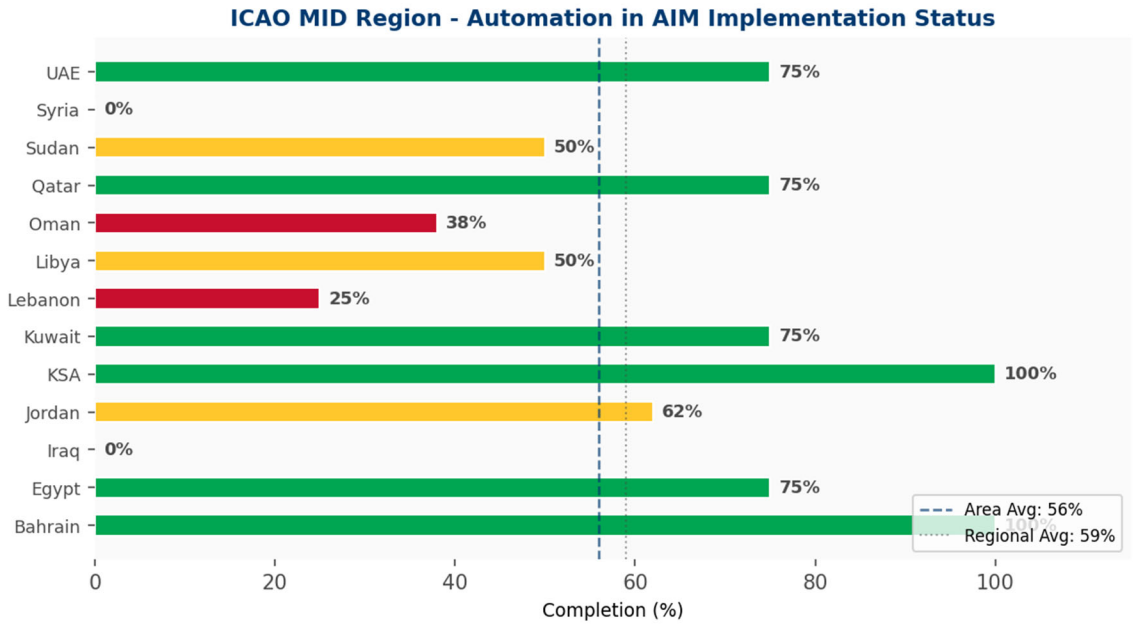
The BBB implementation area has an average regional completion of 83% across the 13 participating States.



State	Completion (%)	Remaining (%)
Bahrain	97%	3%
Egypt	100%	0%
Iraq	73%	27%
Jordan	83%	17%
KSA	98%	2%
Kuwait	100%	0%
Lebanon	71%	29%
Libya	87%	13%
Oman	98%	2%
Qatar	98%	2%
Sudan	66%	34%
Syria	13%	87%
UAE	97%	3%

B.2 Automation in AIM

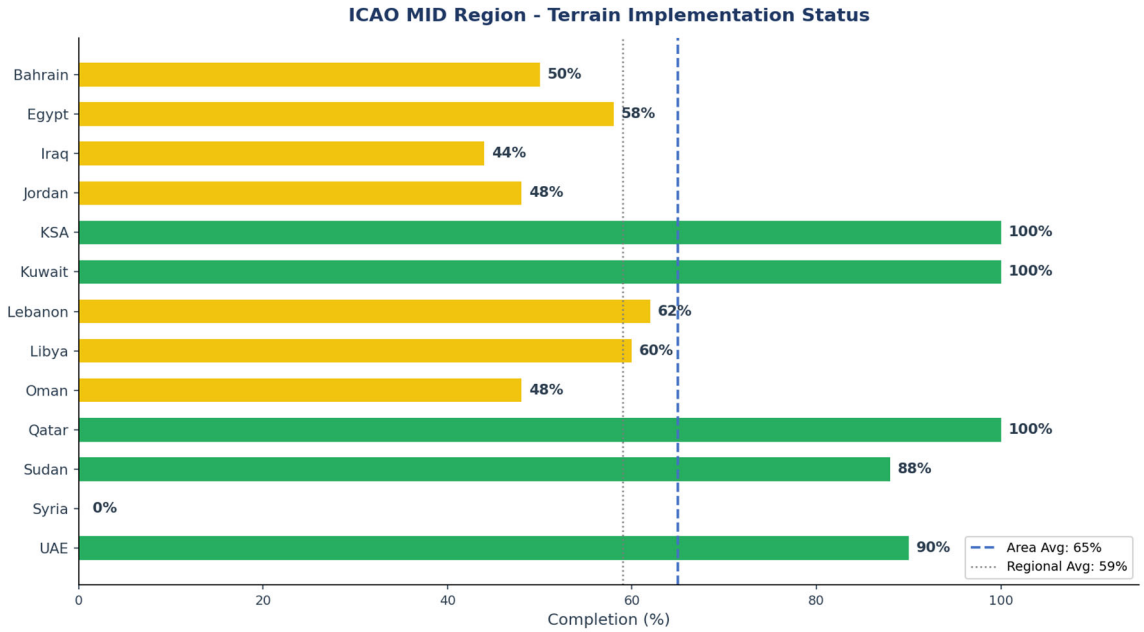
The Automation in AIM implementation area has an average regional completion of 56% across the 13 participating States.



State	Completion (%)	Remaining (%)
Bahrain	100%	0%
Egypt	75%	25%
Iraq	0%	100%
Jordan	62%	38%
KSA	100%	0%
Kuwait	75%	25%
Lebanon	25%	75%
Libya	50%	50%
Oman	38%	62%
Qatar	75%	25%
Sudan	50%	50%
Syria	0%	100%
UAE	75%	25%

B.3 Terrain

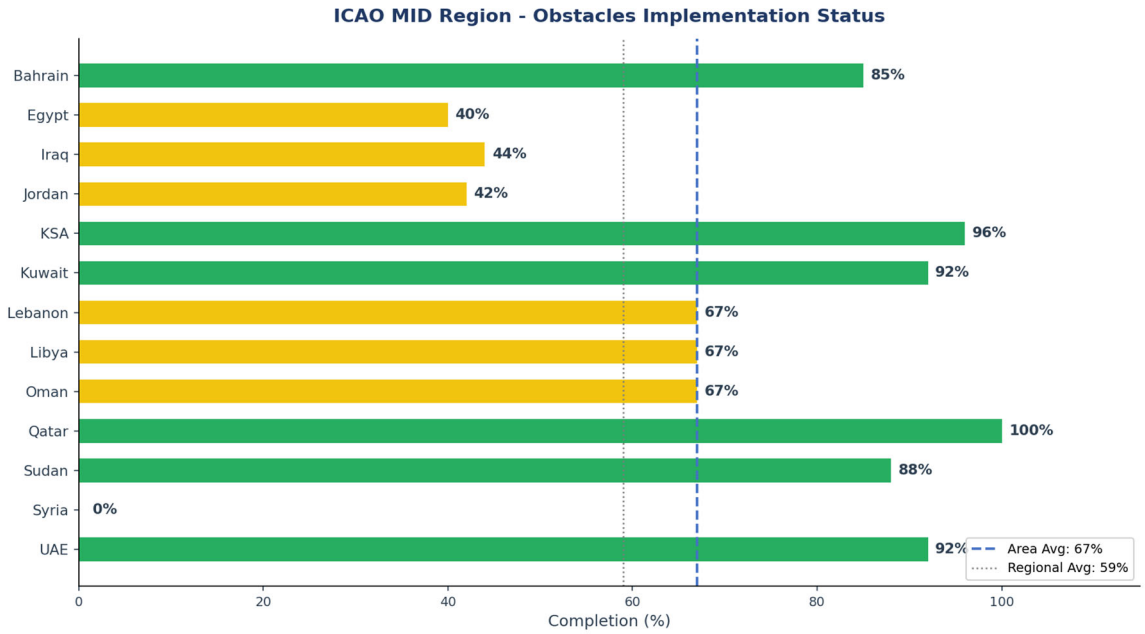
The Terrain implementation area has an average regional completion of 62% across the 13 participating States.



State	Completion (%)	Remaining (%)
Bahrain	50%	50%
Egypt	58%	42%
Iraq	44%	56%
Jordan	48%	52%
KSA	100%	0%
Kuwait	100%	0%
Lebanon	62%	38%
Libya	60%	40%
Oman	48%	52%
Qatar	100%	0%
Sudan	88%	12%
Syria	0%	100%
UAE	90%	10%

B.4 Obstacles

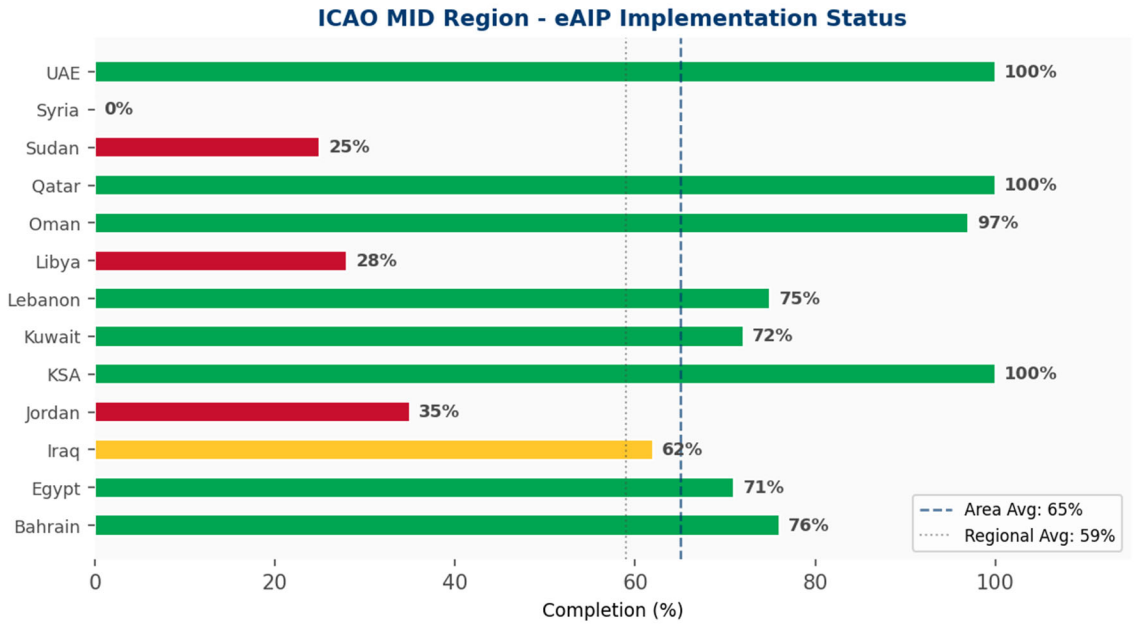
The Obstacles implementation area has an average regional completion of 66% across the 13 participating States.



State	Completion (%)	Remaining (%)
Bahrain	85%	15%
Egypt	40%	60%
Iraq	44%	56%
Jordan	42%	58%
KSA	96%	4%
Kuwait	92%	8%
Lebanon	67%	33%
Libya	67%	33%
Oman	67%	33%
Qatar	100%	0%
Sudan	88%	12%
Syria	0%	100%
UAE	92%	8%

B.5 eAIP

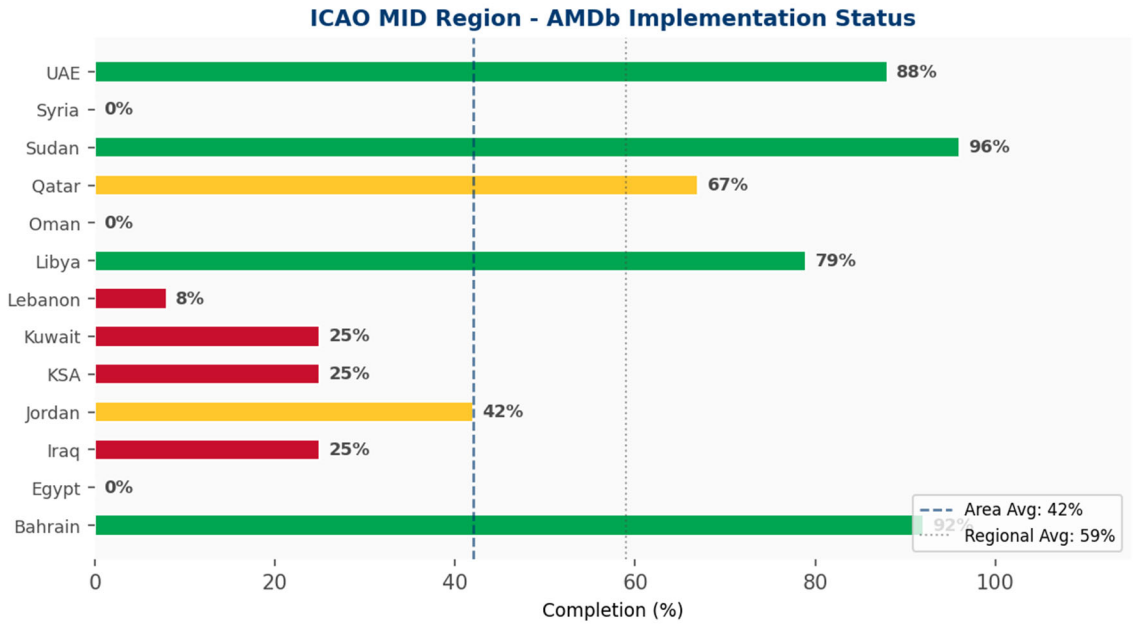
The eAIP implementation area has an average regional completion of 65% across the 13 participating States.



State	Completion (%)	Remaining (%)
Bahrain	76%	24%
Egypt	71%	29%
Iraq	62%	38%
Jordan	35%	65%
KSA	100%	0%
Kuwait	72%	28%
Lebanon	75%	25%
Libya	28%	72%
Oman	97%	3%
Qatar	100%	0%
Sudan	25%	75%
Syria	0%	100%
UAE	100%	0%

B.6 AMDb

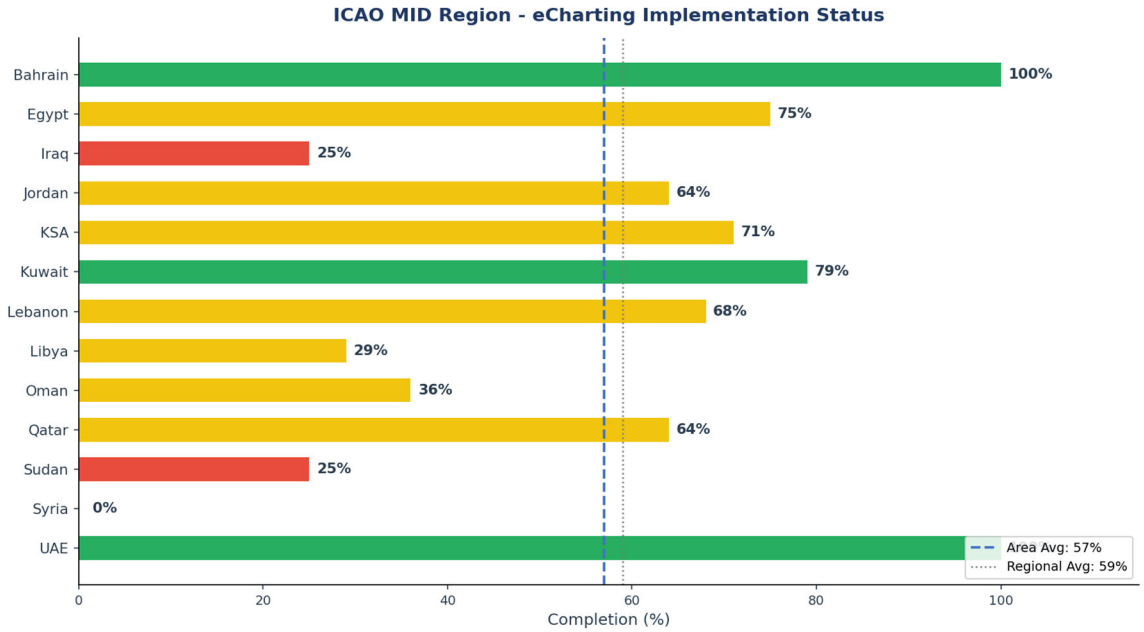
The AMDb implementation area has an average regional completion of 42% across the 13 participating States.



State	Completion (%)	Remaining (%)
Bahrain	92%	8%
Egypt	0%	100%
Iraq	25%	75%
Jordan	42%	58%
KSA	25%	75%
Kuwait	25%	75%
Lebanon	8%	92%
Libya	79%	21%
Oman	0%	100%
Qatar	67%	33%
Sudan	96%	4%
Syria	0%	100%
UAE	88%	12%

B.7 eCharting

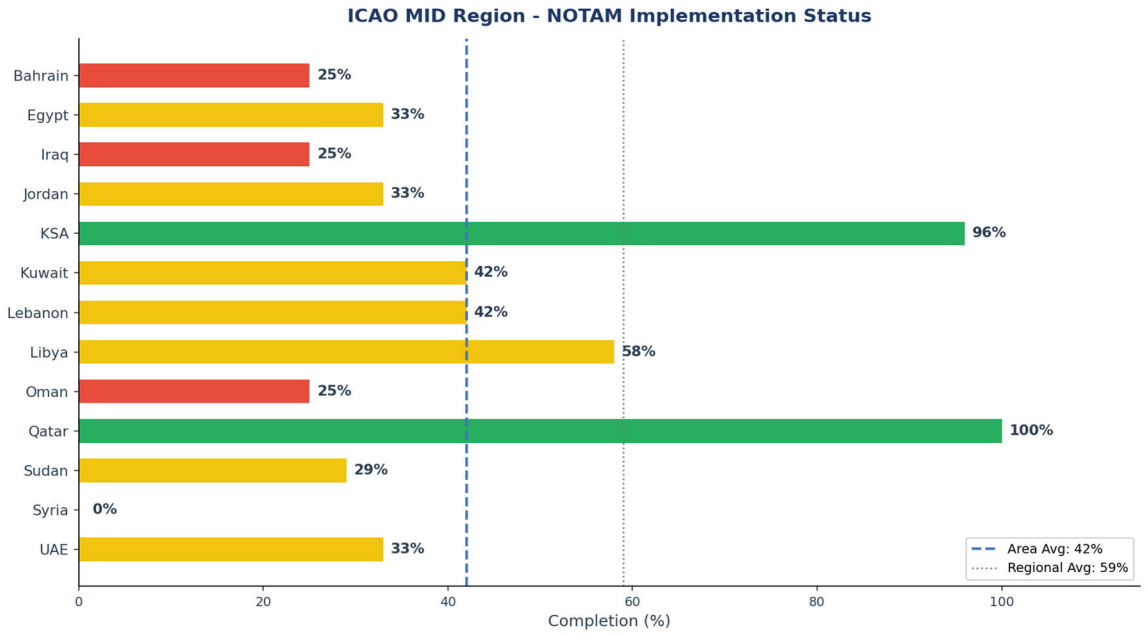
The eCharting implementation area has an average regional completion of 55% across the 13 participating States.



State	Completion (%)	Remaining (%)
Bahrain	100%	0%
Egypt	75%	25%
Iraq	25%	75%
Jordan	64%	36%
KSA	71%	29%
Kuwait	79%	21%
Lebanon	68%	32%
Libya	29%	71%
Oman	36%	64%
Qatar	64%	36%
Sudan	25%	75%
Syria	0%	100%
UAE	100%	0%

B.8 NOTAM

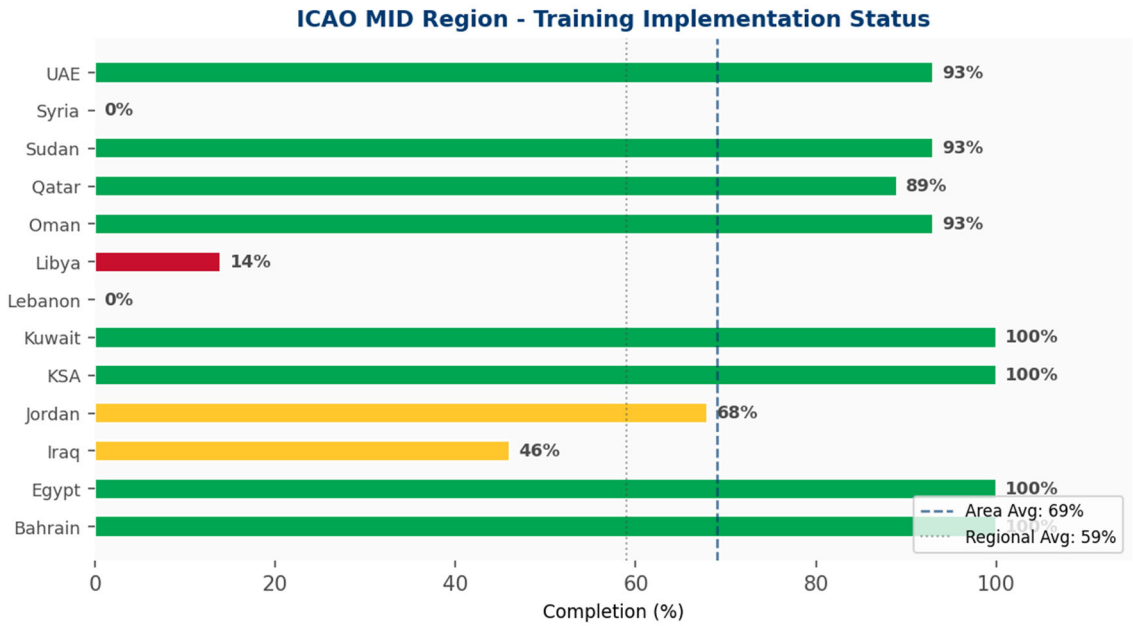
The NOTAM implementation area has an average regional completion of 41% across the 13 participating States.



State	Completion (%)	Remaining (%)
Bahrain	25%	75%
Egypt	33%	67%
Iraq	25%	75%
Jordan	33%	67%
KSA	96%	4%
Kuwait	42%	58%
Lebanon	42%	58%
Libya	58%	42%
Oman	25%	75%
Qatar	100%	0%
Sudan	29%	71%
Syria	0%	100%
UAE	33%	67%

B.9 Training

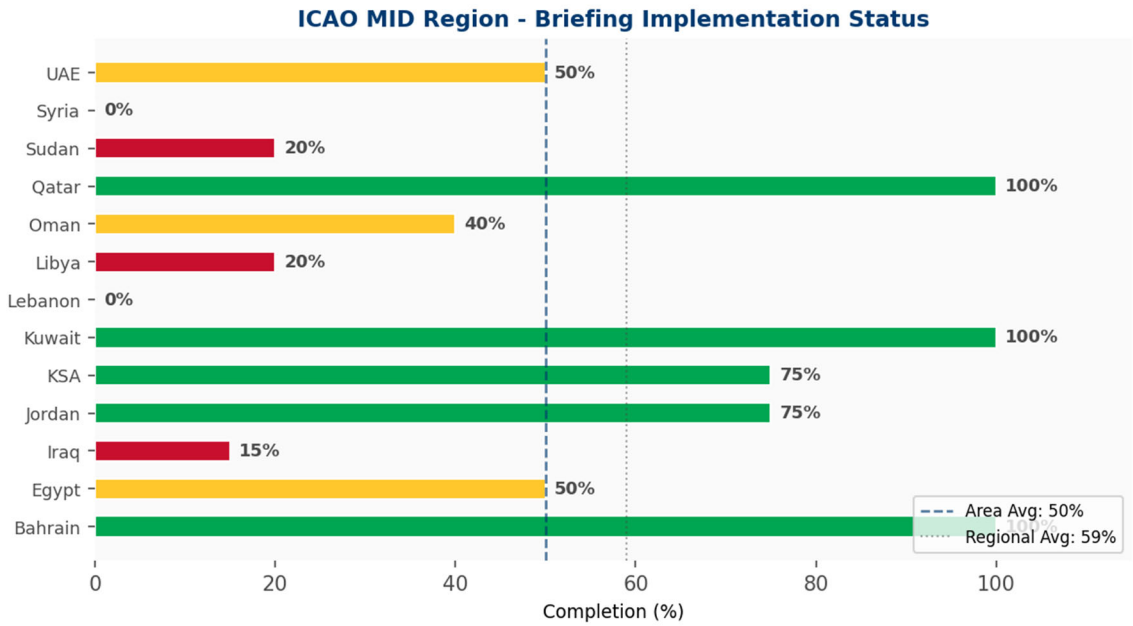
The Training implementation area has an average regional completion of 69% across the 13 participating States.



State	Completion (%)	Remaining (%)
Bahrain	100%	0%
Egypt	100%	0%
Iraq	46%	54%
Jordan	68%	32%
KSA	100%	0%
Kuwait	100%	0%
Lebanon	0%	100%
Libya	14%	86%
Oman	93%	7%
Qatar	89%	11%
Sudan	93%	7%
Syria	0%	100%
UAE	93%	7%

B.10 Briefing

The Briefing implementation area has an average regional completion of 50% across the 13 participating States.

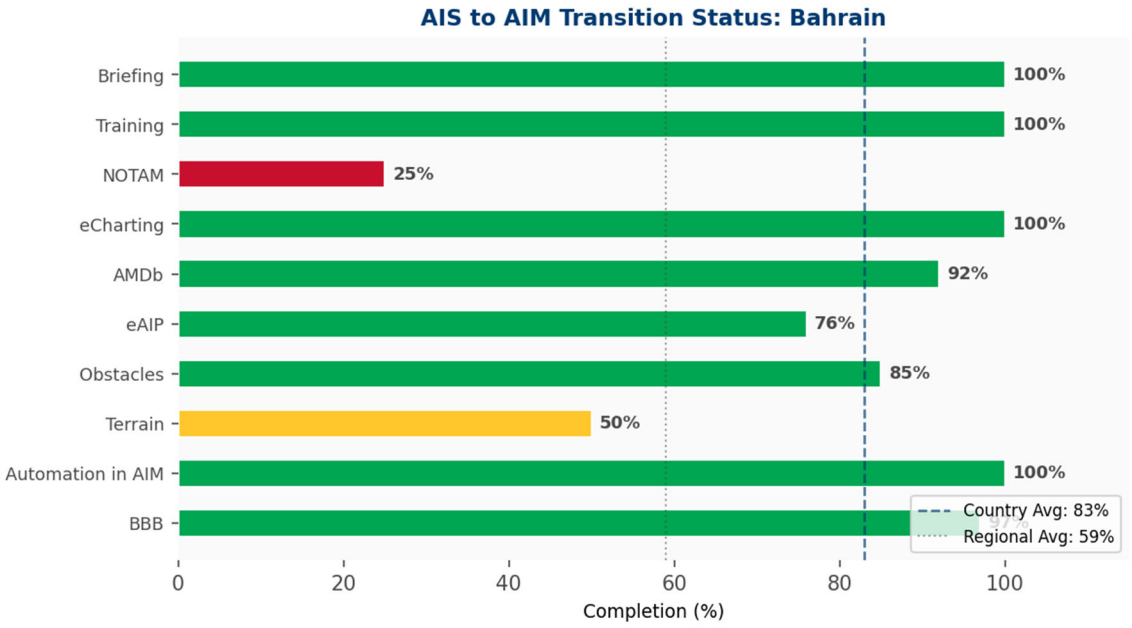


State	Completion (%)	Remaining (%)
Bahrain	100%	0%
Egypt	50%	50%
Iraq	15%	85%
Jordan	75%	25%
KSA	75%	25%
Kuwait	100%	0%
Lebanon	0%	100%
Libya	20%	80%
Oman	40%	60%
Qatar	100%	0%
Sudan	20%	80%
Syria	0%	100%
UAE	50%	50%

Annex C. State-wise Status

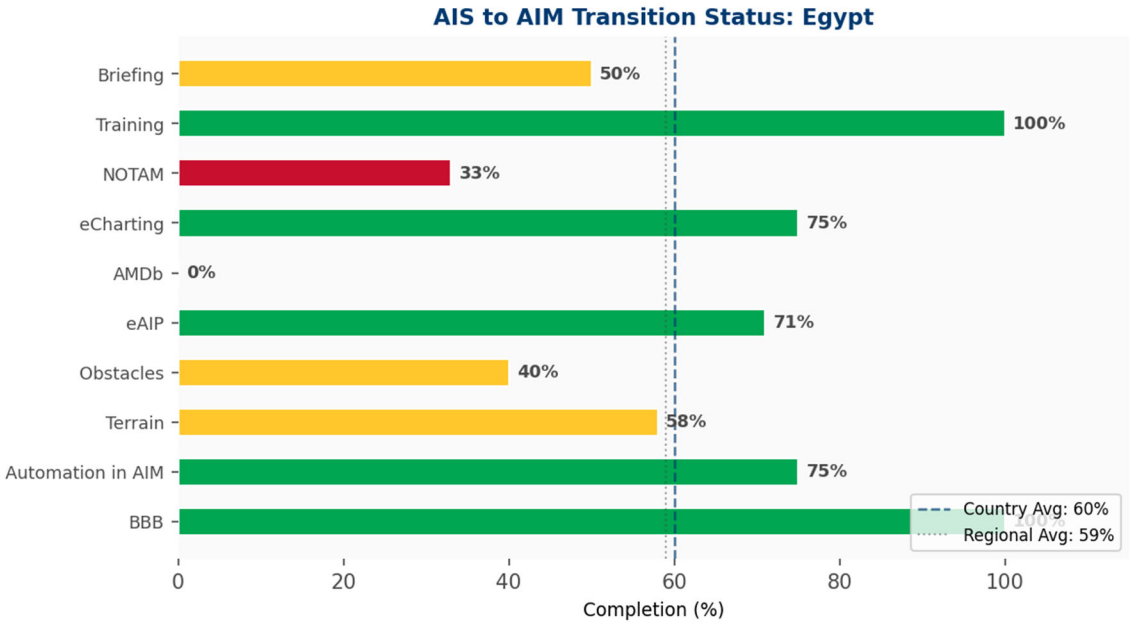
C.1 Bahrain

Bahrain achieves complete implementation across six of the ten implementation areas : BBB (100%), automation in AIM (100%), obstacle data (100%), eAIP (100%), eCharting (100%), and training (100%) and reports a strong briefing score of 100 percent, confirming a comprehensively digitalized AIM environment with fully operationalized publication, charting, and briefing capabilities. AMDB at 75 percent is above the regional average and indicates meaningful progress in airport-surface digitalization, though full coverage across all international airports has not yet been achieved. Terrain data at 50 percent represents a secondary gap that, given Bahrain's otherwise mature profile, should be addressable through targeted data acquisition and processing investment. NOTAM at 25 percent is the most significant remaining weakness and the principal priority for Bahrain's continued AIM development. The contrast between Bahrain's near-complete scores across most domains and its low NOTAM result suggests that digital NOTAM implementation has not yet been given proportionate priority relative to the State's overall digitalization level, and its completion would bring Bahrain to one of the highest overall AIM maturity levels in the region.



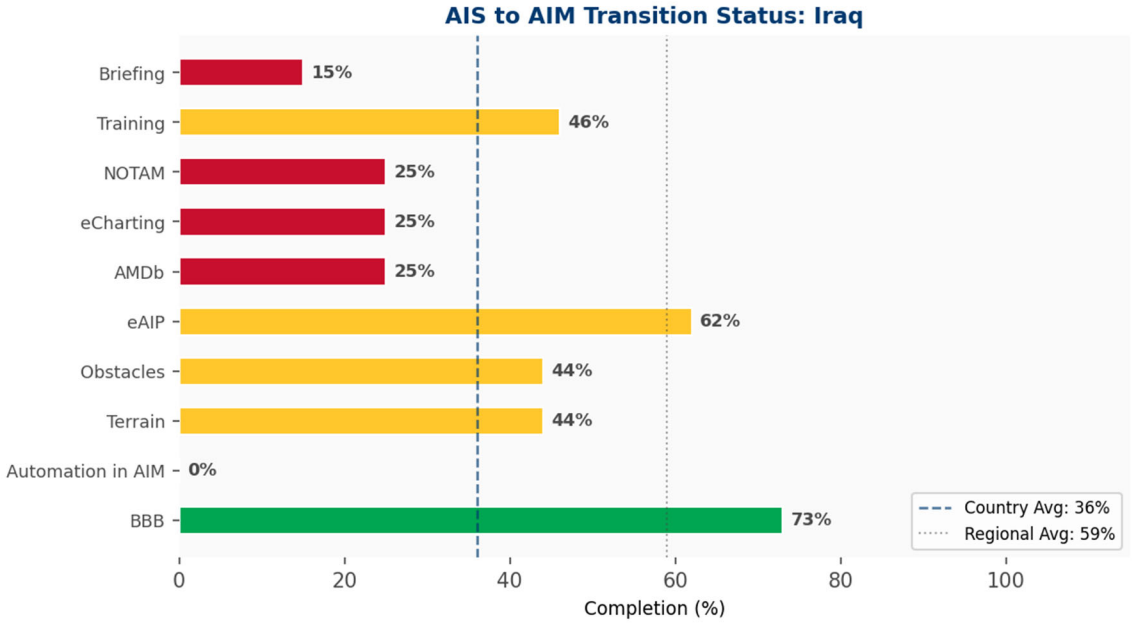
C.2 Egypt

Egypt is assessed as an advanced State with a profile combining strong governance and publication foundations with significant gaps in operational digital services. The BBB (100%), obstacle data (100%), eAIP (97%), and training (97%) results confirm that Egypt has established a comprehensive compliance and publication framework fully aligned with ICAO Annex 15 requirements, and that the institutional and human resource foundations for further digitalization development are in place. Terrain data at 50 percent indicates partial data coverage, and eCharting at 80 percent suggests visible but not yet complete charting modernization. Automation in AIM at 73 percent is a relatively positive result for an advanced-band State and indicates that Egypt has made meaningful progress toward a data-centric AIM environment. The most critical gaps are AMDB at 42 percent, NOTAM at 25 percent, and briefing at 10 percent, the last of which is the most striking finding in Egypt's profile, indicating that despite the State's strong performance in publication and governance domains, the automated digital delivery of aeronautical information to operational end users remains at a very early stage. Addressing briefing automation and digital NOTAM should be treated as Egypt's highest-priority next steps to convert its strong governance and publication foundations into a complete and operationally effective digital AIM environment.



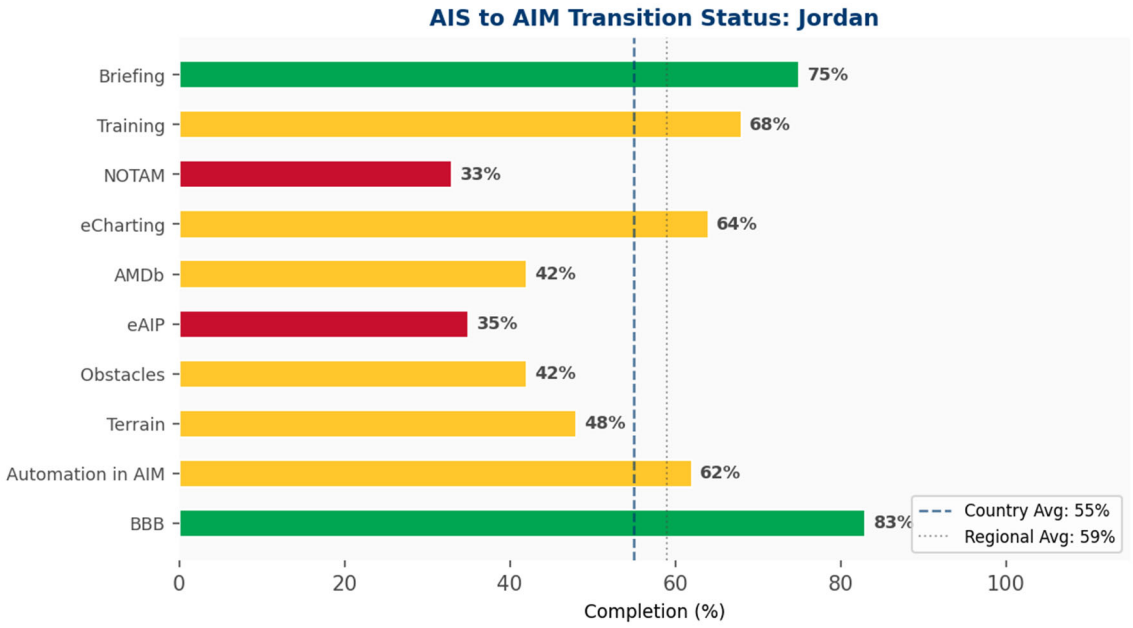
C.3 Iraq

Iraq is assessed as a developing State with one of the lower overall implementation scores among the responding States, reflecting the challenging operating environment and institutional capacity constraints that have affected the pace of AIM modernization. BBB at 83 percent is a genuinely positive finding and confirms that, despite these constraints, Iraq has maintained a foundational compliance and governance framework broadly consistent with ICAO Annex 15 requirements. Training at 73 percent also suggests that some foundational human resource investment has been made. However, beyond these two areas, implementation scores decline significantly across all remaining domains: obstacle data at 42 percent, eAIP at 42 percent, eCharting at 33 percent, automation in AIM at 27 percent, NOTAM at 12 percent, terrain data at 12 percent, AMDB at 8 percent, and briefing at 17 percent. This pattern confirms that while Iraq possesses the governance and institutional acknowledgement of AIM modernization requirements, the translation of this foundation into implemented digital AIM capability across data sets, publication, automation, and operational services has been very limited to date. Iraq's implementation approach should be sequenced and prioritized, beginning with the most high-impact foundational capabilities, structured data set development, eAIP completion, and basic automation, before progressing to more complex digital services. Dedicated and sustained regional technical support, including capacity building and practical implementation assistance, is assessed as essential for Iraq to make meaningful progress within the current MIDANPIRG planning cycle.



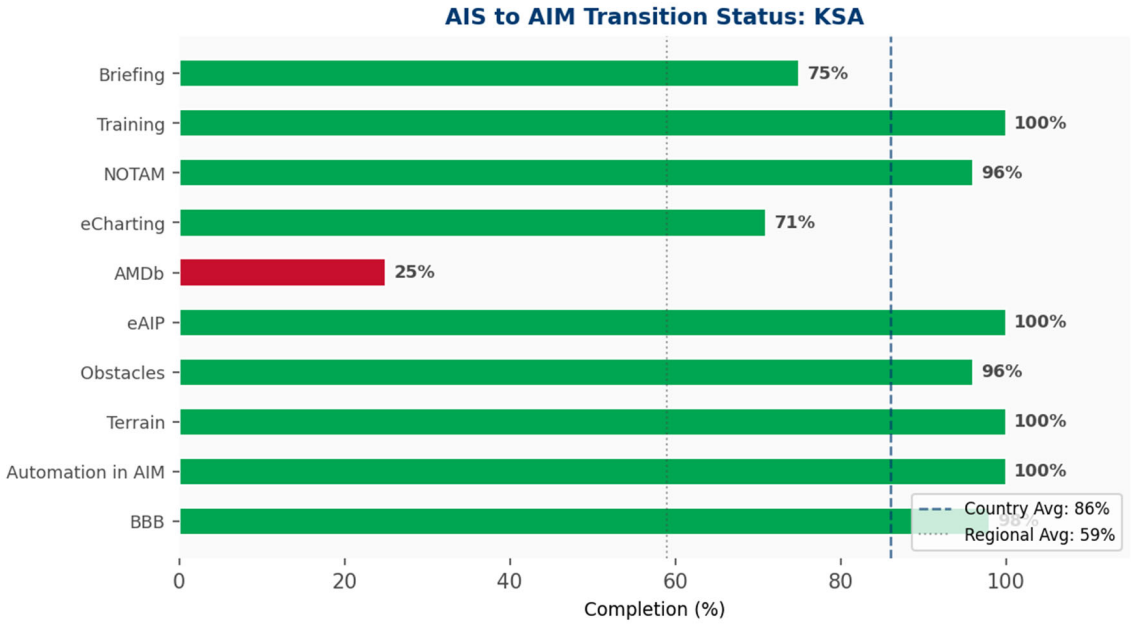
C.4 Jordan

Jordan is assessed as an advanced State with a profile reflecting partial but relatively balanced progress across most implementation areas, underlaid by a governance framework that, while strong, has not yet achieved the complete BBB score of several peer States. BBB at 88 percent, training at 80 percent, and eAIP at 75 percent confirm that foundational compliance arrangements and digital publication capability are reasonably well established, while terrain data (75%), obstacle data (75%), and eCharting (67%) indicate meaningful, if not yet complete, progress in data set and charting modernization. Automation in AIM at 48 percent and NOTAM at 37 percent suggest that the transition toward automated, data-centric AIM workflows is at an early-to-intermediate stage. The most pronounced gaps are AMDB at 33 percent and briefing at 30 percent, confirming that airport-surface digitalization and the automated delivery of digital aeronautical information to operational users are the areas requiring most attention. Jordan's overall profile relatively consistent across mid-level implementation stages, suggests that a broad-front development approach, supported by targeted technical assistance in digital NOTAM, AMDB, and automation, would be the most effective pathway for Jordan to progress from the advanced to the mature band.



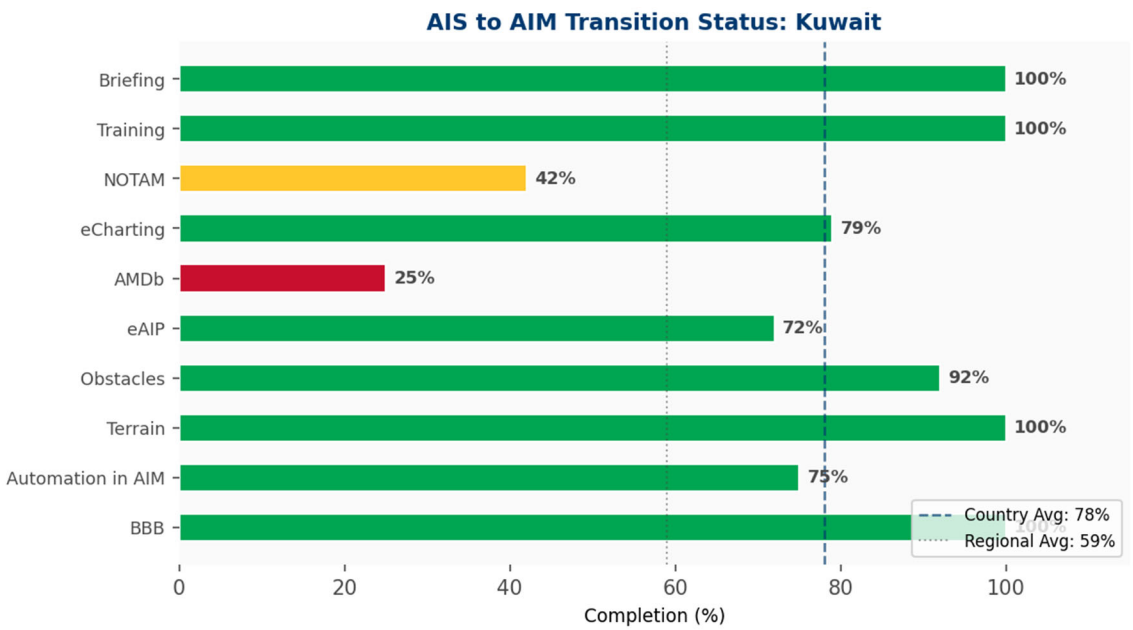
C.5 KSA

The Kingdom of Saudi Arabia presents a mature and broadly balanced AIM digitalization profile, with complete or near-complete scores in BBB (100%), obstacle data (100%), eAIP (97%), training (97%), automation in AIM (92%), eCharting (93%), briefing (90%), and terrain data (88%). These results confirm that KSA has developed a deeply institutionalized digital AIM environment with strong regulatory foundations, advanced publication capability, and an automated operational architecture that places it among the highest-performing States in the region.



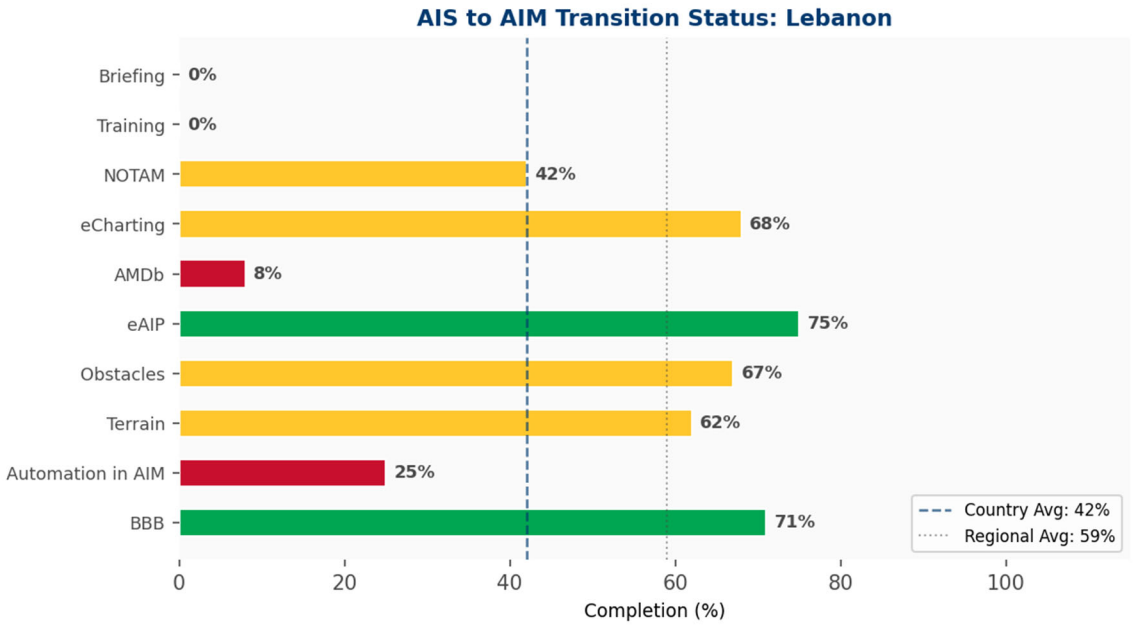
C.6 Kuwait

Kuwait has achieved overall AIS to AIM transition completion rate of 78%, with 22% implementation remaining across the ten areas.



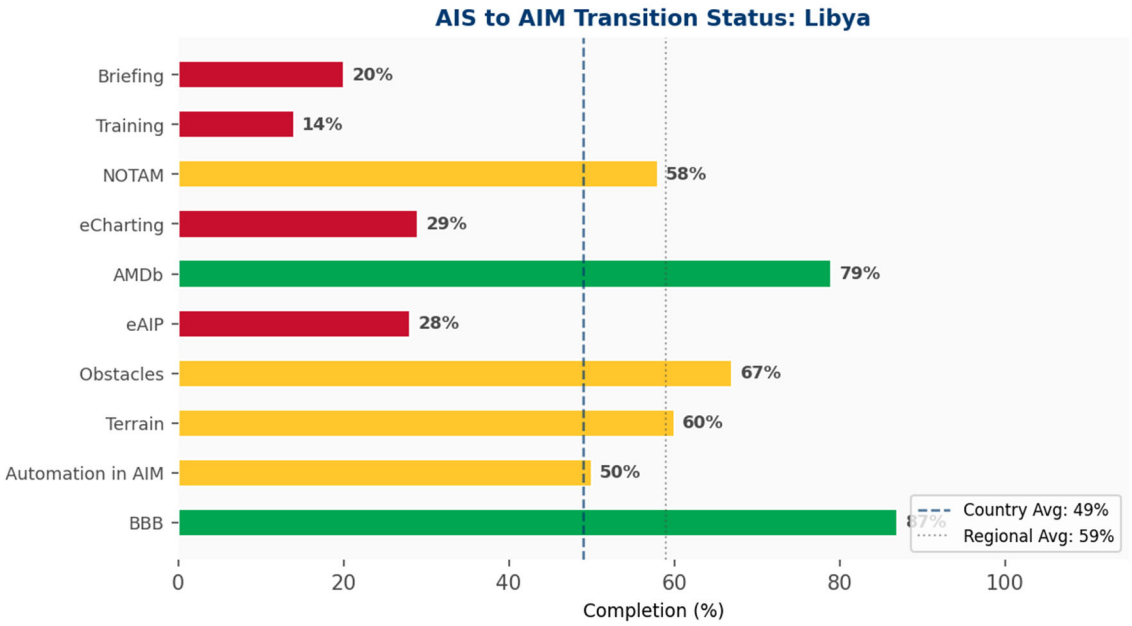
C.7 Lebanon

Lebanon is assessed as a developing State whose implementation profile reflects a combination of established foundational structures and material gaps across the majority of operational and data-intensive domains. BBB at 83 percent and training at 73 percent confirm that Lebanon has maintained meaningful compliance and governance arrangements and has sustained a degree of institutional engagement with AIM workforce development, which together provide a basis for future investment. Obstacle data at 58 percent and terrain data at 50 percent indicate partial progress in data set coverage, while eAIP at 50 percent suggests that publication modernization is at an intermediate stage. Automation in AIM at 38 percent indicates that the transition toward data-centric AIM workflows is at an early stage, and eCharting at 40 percent confirms that digital charting has not yet been fully established. The most critical gaps are AMDB at 25 percent, NOTAM at 25 percent, and briefing at 17 percent, collectively confirming that Lebanon's operational AIM environment retains significant traditional, non-digital characteristics. The survey evidence also reflects that Lebanon faces real institutional and resource constraints that affect implementation capacity. Focused external support, particularly in technical workshops, practical AIXM and NOTAM implementation guidance, and human resource development, would be expected to yield meaningful improvement in Lebanon's digitalization trajectory.



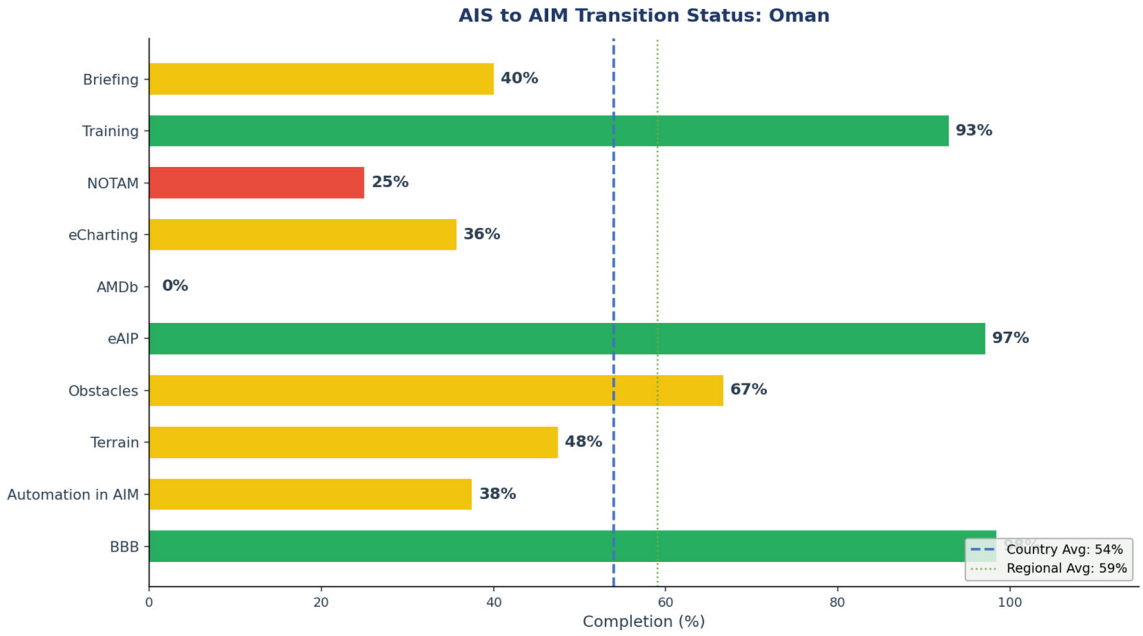
C.8 Libya

Libya is assessed as a developing State with an implementation profile reflecting genuine but uneven progress across the ten survey domains, against a backdrop of institutional and operational constraints that have historically affected implementation momentum. BBB at 83 percent is a substantively positive result and confirms that Libya has established meaningful foundational compliance and governance arrangements consistent with ICAO Annex 15. Obstacle data at 75 percent, eAIP at 75 percent, and terrain data at 62 percent indicate that progress has been made in core data set and publication areas, with eAIP in particular showing that Libya has begun the transition from conventional publication practices toward more structured digital products. Training at 73 percent is above the level that might be expected for a developing-band State and suggests that workforce development has been a recognized priority. However, automation in AIM at 47 percent, eCharting at 47 percent, AMDB at 33 percent, NOTAM at 25 percent, and briefing at 20 percent collectively confirm that the operational and automation dimensions of AIM digitalization remain significantly underdeveloped. The overall profile suggests that Libya's primary challenge is not an absence of institutional engagement with AIM modernization but rather the need for sustained investment and technical support to convert its governance and data set foundations into a more complete and operationally active digital AIM environment.



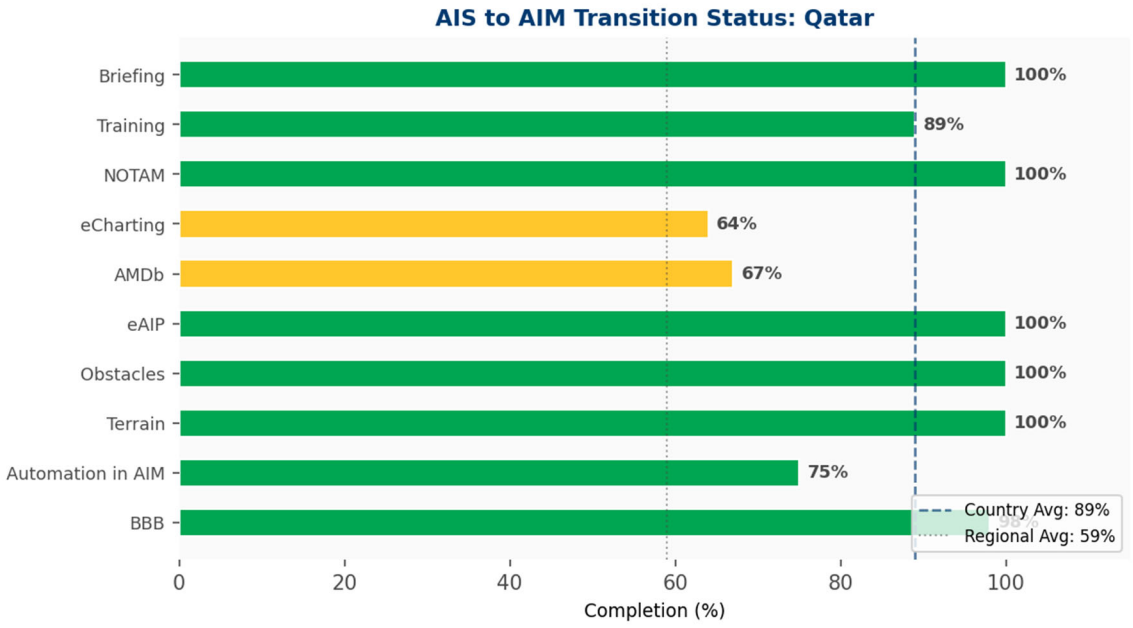
C.9 Oman

Oman presents one of the most distinctive implementation profiles in the MID Region. Its overall score of 54 percent places it in the advanced category, but this aggregate result substantially understates the State's advanced capability in several foundational and publication domains. BBB at 98 percent, eAIP at 97 percent, and training at 93 percent are among the highest results in the region for those areas, confirming that Oman has established an exceptionally strong governance, compliance, and publication foundation, with a highly developed institutional and human resource base for AIM. These strengths represent a critical enabling platform for further digitalization. However, Oman's profile is sharply differentiated between these high-performing areas and lower scores in terrain data (48%), AMDB (0%), NOTAM (25%), and eCharting (36%), indicating that investment in digital data sets, operational digital services, and automation has been limited or only recently initiated. The overall score must therefore be interpreted as reflecting selective implementation depth rather than broad-based institutional weakness. Oman's strategic priority is clear: to mobilize its advanced governance and institutional foundations to drive targeted and urgent investment in terrain, AMDB, digital NOTAM, and eCharting, ideally within a structured multi-year programme aligned with the AIMDP TF workstream framework.



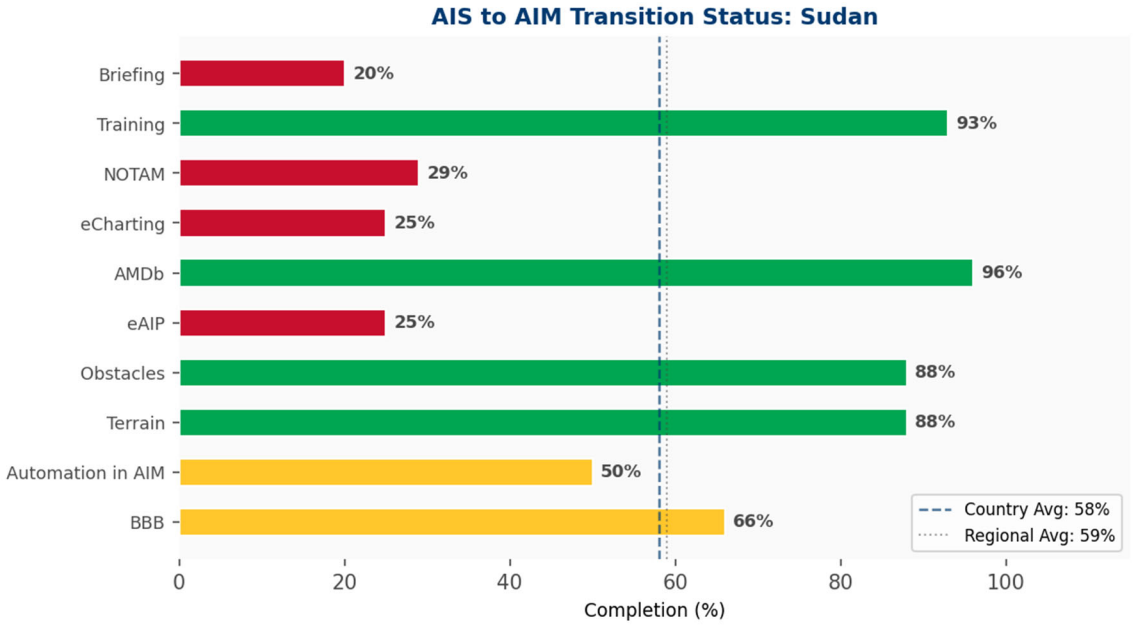
C.10 Qatar

Qatar demonstrates one of the strongest and most comprehensive AIM digitalization profiles in the MID Region, achieving near-complete or complete implementation across the majority of domains, including BBB (100%), eCharting (100%), terrain data (97%), obstacle data (97%), training (97%), eAIP (95%), briefing (90%), and AMDB (88%). This breadth of performance confirms that Qatar has established not only a strong governance and compliance foundation but also substantial operational digital capability, positioning it as a leading reference State within the region. The sole area of relative weakness is NOTAM modernization at 47 percent, which, while the highest NOTAM score among all responding States, remains below the threshold of full digital operationalization and represents the principal remaining priority for Qatar's AIM digitalization programme. Addressing the NOTAM gap would bring Qatar to a level of near-complete digital AIM maturity across all ten implementation areas.



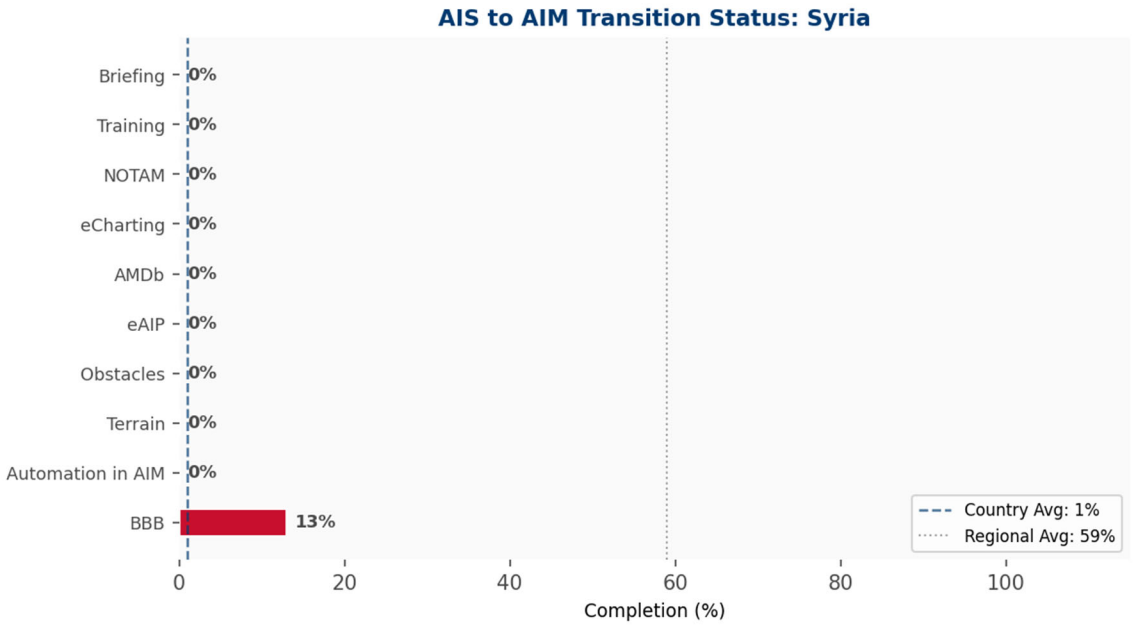
C.11 Sudan

Sudan is assessed as advanced with a profile distinguished by an exceptionally strong governance and training foundation alongside markedly lower results in operational and data-intensive domains. The BBB (100%) and training (100%) scores, both at complete implementation, confirm that Sudan has established a fully compliant regulatory and institutional base and a strong commitment to AIM workforce development, which together represent a meaningful platform for further digitalization investment. Terrain data (75%), obstacle data (75%), eAIP (75%), and eCharting (75%) results suggest that Sudan has made consistent, if partial, progress across the core digital data and publication areas, though none of these areas has yet been fully implemented. Automation in AIM at 57 percent indicates that the transition toward a data-centric environment is underway but remains in its intermediate stages. The most significant gaps are AMDB at 25 percent, NOTAM at 25 percent, and briefing at 25 percent, all of which are at an early level of implementation and confirm that the operational end of the digital AIM value chain has not yet been adequately developed. Sudan's clear priority is to leverage its strong governance and training base to drive targeted investment in automation, digital NOTAM, AMDB, and briefing capability, supported by regional technical assistance as needed.



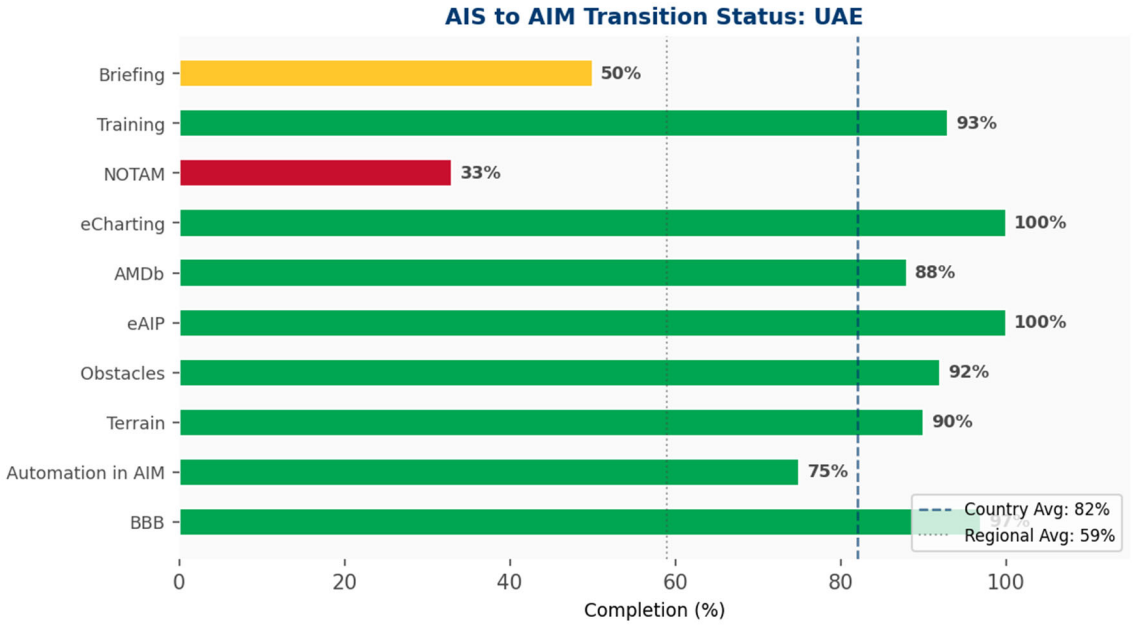
C.12 Syria

Syria is assessed at the initial stage of AIM digitalization, with an overall score of 1 percent reflecting the exceptional operational and institutional circumstances prevailing in that State, rather than an absence of recognition of AIM modernization requirements. The single recorded score of 13 percent in the BBB domain is the only area where any partial implementation is indicated; all remaining nine implementation areas are reported at zero percent. This result is understood to reflect the profound disruption to civil aviation infrastructure, institutional capacity, and operational continuity that Syria has experienced, and it must be treated in regional planning discussions with commensurate sensitivity and contextual awareness. Syria's situation is not analogous to that of other developing-band States where implementation gaps result primarily from resource or prioritization constraints. Rather, a foundational reconstruction of civil aviation institutional capacity, including the re-establishment of qualified AIM personnel, regulatory oversight structures, basic operational systems, and external connectivity, will be a prerequisite before standard AIM digitalization programming can be meaningfully initiated. The AIMDP TF and the ICAO MID Regional Office should consider designing a dedicated, tailored, and long-term support pathway for Syria that begins with foundational institutional stabilization and basic AIM service restoration before progressing toward the digitalization targets applicable to other MID States.

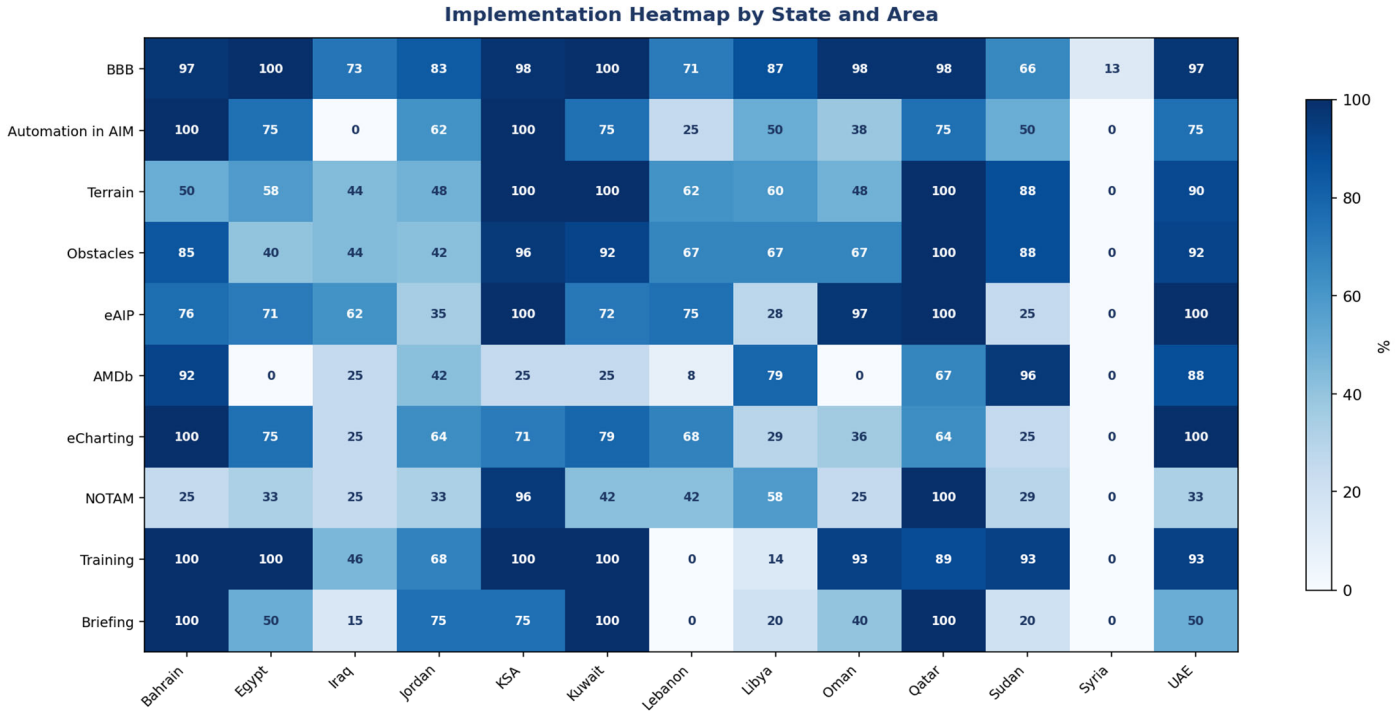


C.13 UAE

The UAE's profile confirms a fully established digital AIM governance framework supported by comprehensive terrain and obstacle data coverage, advanced publication and charting capability, and a mature automation environment, collectively representing one of the most operationally complete AIM implementations in the MID Region. AMDB at 67 percent indicates continued progress in airport-surface digitalization, with full coverage not yet achieved. Briefing at 80 percent, while above the regional average, also indicates some residual gaps in the automated delivery of digital information to operational end users. The most critical remaining gap is NOTAM at 12 percent. Prioritizing digital NOTAM implementation would address the most material gap in the UAE's AIM digitalization programme and substantially strengthen the end-to-end digital information chain.



Annex D. Implementation Status by State and Area



Annex figure. Heatmap view of detailed State-by-area implementation percentages

Annex E. Common implementation issues raised by respondents

- The following implementation challenges were identified through analysis of the qualitative sections of the State response workbooks. These issues are presented in consolidated form to inform the prioritization of regional support measures under the AIMDP TF workstreams.

- Barriers most frequently cited:
  - Funding constraints and procurement delays, cited as the most recurrent barrier across all maturity groups.
  - Insufficient technical capacity and shortage of personnel with specialist AIM digitalization skills.
  - Need for additional practical guidance on ICAO digital data requirements, including AIXM implementation, eAIP production, and SWIM architecture.
  - Limited availability of aeronautical source data in formats compatible with AIXM-based processing.
  - Absence of automated interfaces with data originators and the associated institutional coordination challenges.
  - Requirements for SWIM-related infrastructure investment.
  - Cybersecurity considerations for two-way digital data exchange.

- Most frequently requested forms of support:
  - Technical workshops and targeted AIM training (most frequently requested).
  - Peer-State knowledge sharing and reference practice documentation.
  - Practical step-by-step implementation guidance for specific domains (NOTAM, AMDB, AIXM).
  - Strengthening of human resources and institutional capacity for AIM digitalization programme management.
  - Regional guidance material on data originator agreement templates and data chain governance.

APPENDIX B

MID Region Implementation Plan for Digital Data sets

First Edition — 2026

International Civil Aviation Organization
MIDDLE EAST Air Navigation Planning and Implementation Regional Group
(MIDANPIRG)

RECORD OF AMENDMENTS AND CORRIGENDA

Version	Date	Description
1.0	March 2026	First edition

FOREWORD

This First Edition (2026) has been developed under the authority of MIDANPIRG and reflects the collective commitment of MID Region States to the digitalization of aeronautical information in support of FF-ICE and Trajectory-Based Operations.

The Plan establishes the MID Region framework for the provision of digital aeronautical data sets, addressing what to provide, how to provide it, and when to provide it. It is intended to complement, and must be read in conjunction with, ICAO Annex 15 — Aeronautical Information Services, PANS-AIM (Doc 10066), and the supporting guidance material listed in Appendix A.

This Plan is a living document. It will be reviewed and updated periodically by the AIMDP TF under MIDANPIRG, to reflect progress in national implementation, developments in international standards, and the evolving requirements of the ATM environment, including the transition to System-Wide Information Management (SWIM) and the future applicability of Flight and Flow Information for a Collaborative Environment (FF-ICE).

States are encouraged to use this Plan as the reference framework for developing their national digital data sets implementation plans, in accordance with the template provided in Appendix B.

The Plan is structured in three Parts and three Appendices:

Part I — General Aspects of Digital Aeronautical Data Sets
Part II — Digital Aeronautical Data Sets: Requirements, Standards, and Specifications
Part III — Coordinated Regional Deployment
Appendix A — Regulatory and Guidance Material References
Appendix B — National Implementation Plan Template
Appendix C — PANS-AIM to AIXM 5.1/5.1.1 Mapping Tables

EXECUTIVE SUMMARY

The aeronautical information environment is undergoing a fundamental transformation. The shift from paper-based Aeronautical Information Services (AIS) to digital Aeronautical Information Management (AIM) is no longer a future aspiration, it is an ongoing obligation, grounded in the Standards and Recommended Practices of ICAO Annex 15 and the Procedures for Air Navigation Services , Aeronautical Information Management (PANS-AIM, Doc 10066).

This MID Region Implementation Plan for Digital Data sets provides MID Region States with a coordinated framework to manage that transition. It answers three practical questions: what digital aeronautical data sets are required, how they should be produced and encoded, and when they should be made available.

What. Five categories of digital aeronautical data sets are addressed: terrain data sets, obstacle data sets, AIP data sets, aerodrome mapping data sets, and instrument flight procedure data sets. The scope, content, and quality requirements for each category are specified in accordance with Annex 15 and PANS-AIM, with MID Region-specific elaborations where appropriate.

How. All digital data sets shall be encoded in internationally agreed formats, primarily the Aeronautical Information Exchange Model (AIXM) version 5.1/5.1.1, with AIXM 5.2 applicable to instrument flight procedure data sets. Detailed coding specifications and PANS-AIM to AIXM mapping tables are provided in Appendix C for the AIP data set, which constitutes the most complex data set in terms of encoding scope. In the medium term, digital data sets shall be made available as System-Wide Information Management (SWIM) information services.

When. Target provision dates are defined for each data set category, taking into account PANS-AIM applicability and the phased nature of the transition. The implementation timeline spans 2020 to 2031, with Terrain and Obstacle Data (TOD) from 2020 to 2027, aerodrome mapping data sets from 2020 to 2027, AIP data sets from 2026 to 2030, and instrument flight procedure (IFP) data sets from 2026 to 2031.

Each member State is required to prepare and submit a national digital data sets implementation plan, structured in accordance with the template provided in Appendix B, and to update it at least annually. The AIM Sub-Group (AIM/SG) will monitor implementation progress and report to MIDANPIRG, as needed.

This Plan shall be reviewed by the AIMDP TF at intervals not exceeding two years, or sooner if triggered by:

- Amendments to ICAO Annex 15 or PANS-AIM
- Material changes to AIXM standards (e.g., AIXM 5.2 finalization)
- Significant shifts in regional implementation status

Amendments to this Plan shall be reviewed by the AIM/SG and endorsed by MIDANPIRG. An amendment record shall be maintained.

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GLOSSARY

Terms and definitions used in this document are, unless otherwise stated, those contained in ICAO Annex 15 — Aeronautical Information Services, PANS-AIM (Doc 10066), and the ICAO Aeronautical Information Services Manual (Doc 8126).

ABBREVIATIONS/ACRONYMS

AIM	Aeronautical information management
AIP	Aeronautical information publication
AIRAC	Aeronautical Information Regulation and Control
AIS	Aeronautical information service
AIXM	Aeronautical information exchange model
AMD	Aerodrome Mapping Data
AMDB	Aerodrome Mapping Database
ANSP	Air Navigation Services Provider
ASBU	Aviation System Block Upgrade
ATM	Air traffic management
DAIM	Digital Aeronautical Information Management
DPS	Data Product Specification
DTM	Digital Terrain Model
EUROCONTROL	European Organization for the Safety of Air Navigation
FF-ICE	Flight and Flow Information for a Collaborative Environment
FMS	Flight Management System
GANP	Global Air Navigation Plan
GIS	Geographic Information System
GML	Geography Markup Language
IFP	Instrument Flight Procedure
IM	Information management
IP	Internet protocol
MIDANPIRG	Middle East Air Navigation Planning and Implementation Regional Group
NDIP	National Digital Data Set Implementation Plan
PBN	Performance-Based Navigation
QMS	Quality Management System
SARPs	Standards and Recommended Practices
SWIM	System Wide Information Management
TBO	Trajectory Based Operations
TOD	Terrain and Obstacle Data
UUID	Universal Unique Identifier
UML	Unified Modelling Language
WGS-84	World Geodetic System-1984
XML	Extensible Markup Language

PART I — BACKGROUND, OBJECTIVES, AND GOVERNANCE

1. Introduction

1.1 The necessity of quality-assured digital data sets to support the integration of aeronautical information in ATM and aviation-related applications, and the rationale for the transition from product-centric to data-centric environments, are explained in are described in PANS-AIM (Doc 10066), Chapters 1 and 5, and elaborated in EUROCONTROL Guidelines for Harmonised AIP Publication and Data Set Provision (SD 1, Appendix A). Member States should be familiar with those documents as the foundation for this implementation plan.

1.2 The term Aeronautical Information Product was introduced with the 16th Edition of Annex 15 to cover all AIS deliverables provided in digital form or as standardized presentation in paper or electronic form. PANS-AIM (Doc 10066) provides expanded specifications for digital data sets and digital data exchange. The five categories of digital data sets specified in Annex 15 as elements of the Aeronautical Information Products are:

- Terrain data set;
- Obstacle data set;
- AIP data set;
- Aerodrome mapping data set; and
- Instrument flight procedure (IFP) data set.

Note: The ordering above reflects the regulatory priority established in Annex 15 and the recommended sequencing for MID Region implementation. Terrain and obstacle data sets are governed by mandatory Standards (shall) in Annex 15. AIP, aerodrome mapping and IFP data sets are currently governed by Recommended Practices (should). This distinction determines implementation priority under the MID Region deployment framework in Part III.

1.3 Providing digital data sets in compliance with standard digital data exchange requirements, including the use of the Aeronautical Information Exchange Model (AIXM), is a fundamental step toward the implementation of System-Wide Information Management (SWIM). For further guidance, refer to PANS-AIM (Doc 10066), Section 5.4, and the ICAO Manual on System-Wide Information Management (SWIM) Concept (Doc 10039).

2. Regulatory Foundation

2.1 The provision of digital aeronautical data sets is governed by:

- ICAO Annex 15 — Aeronautical Information Services (terrain and obstacle data sets are mandatory Standards; AIP, aerodrome mapping, and IFP data sets are Recommended Practices)
- PANS-AIM (Doc 10066) — Procedures for Air Navigation Services — Aeronautical Information Management
- Doc 8126 — Aeronautical Information Services Manual, 7th Edition, 2022 (Parts I, II and III — informative guidance for AIS operations)
- Doc 9881 — Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information

Note: Doc 8126 Part IV — Digital Data Sets is under development. It is not yet published and therefore does not form part of the normative basis of this Plan. Upon publication, the AIMDP TF shall assess its impact and propose amendments as required.

2.2 A complete list of applicable ICAO documents and supporting guidance material is provided in Appendix A.

3. MID Region Imperative

3.1 The MID Region presents particular operational characteristics that strengthen the case for early and comprehensive implementation of digital data sets, including high-density international traffic, a concentration of major international hub aerodromes, and the operational needs of cross-regional ATM coordination.

3.2 Harmonised provision of digital data sets across MID Region States will enable seamless data exchange, reduce fragmentation of the aeronautical information chain, and support State obligations under ICAO's Global Air Navigation Plan (GANP) and the Aviation System Block Upgrades (ASBU) framework.

4. Objectives

4.1 The MID Region Implementation Plan for Digital Data sets pursues the following objectives:

- Establish a harmonised regional framework for the provision of all five categories of digital aeronautical data sets in accordance with ICAO Annex 15 and PANS-AIM
- Define the technical standards, encoding specifications, data quality requirements, and distribution mechanisms applicable across the MID Region
- Establish a coordinated implementation timeline enabling progressive, phased transition to full digital data set provision by 2031
- Support States in developing and maintaining National Digital Data Set Implementation Plans
- Provide a monitoring and governance framework to track regional implementation progress and report to MIDANPIRG

5. Governance and Institutional Framework

5.1 MIDANPIRG and the AIM Sub-Group

The MIDANPIRG (MID Air Navigation Planning and Implementation Regional Group) provides strategic oversight of AIM modernisation in the MID Region. MIDANPIRG directs the AIM Sub-Group (AIM/SG) to monitor implementation progress and report at each MIDANPIRG meeting.

The AIM Sub-Group (AIM/SG) is the primary working body for AIM matters within MIDANPIRG. Its responsibilities with respect to digital data sets include:

- Monitoring State progress against this Plan and National Plans
- Reviewing and endorsing updates to the Plan
- Recommending regulatory or procedural actions to MIDANPIRG where implementation gaps are identified.

5.2 AIM Digitalization and planning Task Force (AIMDP TF)

The Aeronautical Information Management Digitalization & Planning Task Force (AIMDP TF) was established by the MIDANPIRG/21 meeting to interalia ensure the synchronized and harmonized deployment of digital AIS data sets across the MID Region. The AIMDP TF aims to foster the harmonization and digitalization of the aeronautical data chain. The Task Force develops and aligns the Regional Plan for the provision of digital data sets, in accordance with ICAO Annex 15 , PANS-AIM and AIS Manual. This includes defining the required formats, coding specifications, and implementation timelines to ensure consistent deployment across the MID Region. The AIMDP TF shall continue to provide technical support during the implementation period of this plan, including:

- Reviewing and updating Appendix C (mapping tables) as AIXM standards evolve
- Supporting States with technical queries related to data encoding and validation

5.3 State Responsibilities

Each MID member State shall:

- Develop and maintain a National Digital Data Set Implementation Plan (NDIP) in accordance with the template in Appendix B, and submit it to the ICAO MID Office by End of December each year;
- Update the NDIP at least annually, or following any material change to the national implementation position;
- Report implementation progress to AIM/SG through the ICAO MID Office.

5.4 ICAO MID Office

The ICAO MID Regional Office provides secretariat support to MIDANPIRG AIM/SG and AIMDP TF. With respect to this Plan, the ICAO MID Office shall:

- Maintain a registry of National Digital Data Set Implementation Plans
- Report the current status of MID Region implementation to MIDANPIRG on annual basis.

PART II — DIGITAL AERONAUTICAL DATA SETS: REQUIREMENTS, STANDARDS, AND SPECIFICATIONS

1. GENERAL REQUIREMENTS FOR ALL DIGITAL DATA SETS

1.1. Data Set Categories and Scope

1.1.1. Five categories of digital aeronautical data sets are required under ICAO Annex 15 and PANS-AIM. Their regulatory status and primary intended uses are summarized below:

Category	Regulatory Status	Primary Use
Terrain data set	Standard (shall)	TAWS, EGPWS, airspace design, ATM systems
Obstacle data set	Standard (shall)	Obstacle clearance, procedure design, TAWS
AIP data set	Recommended Practice (should)	Flight planning, data service provision, avionics databases
Aerodrome Mapping data set	Recommended Practice (should)	A-SMGCS, surface movement, electronic charts
IFP data set	Recommended Practice (should)	Procedure coding, avionics databases, FMCS

1.1.2. The distinction between mandatory Standards and Recommended Practices does not reduce the urgency of implementation for the latter categories. The growing dependence of ATM systems and avionics on machine-readable procedure and aerodrome data renders AIP, aerodrome mapping, and IFP data sets operationally essential.

1.1.3. The purpose and intended use of each data set category are further described in PANS-AIM (Doc 10066), Chapter 5, and ICAO Doc 9881 — Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information.

1.2. Data format requirements

1.2.1. For the interoperability of aeronautical data and the effectiveness of the upstream and downstream data chain across the MID Region, AIP data sets, AMDB and obstacle data sets shall be provided in AIXM 5.1/5.1.1 format, as a minimum.

1.2.2. AIXM version 5.2 has been published and is recommended for use with instrument flight procedure (IFP) data sets. It supports IFP data sets, including the elements required for Performance-Based Navigation (PBN). States are encouraged to monitor its implementation status through the AIXM Change Control Board. Further technical information is available at: https://aixm.aero/page/aixm-52

1.2.3. The recommended exchange formats for terrain data sets are GeoTIFF and point cloud formats (for example, LiDAR-derived data). Technical specifications, packaging guidance and best practices for terrain data exchange are provided in EUROCONTROL Terrain and Obstacle Data (TOD) Manual available at : https://www.eurocontrol.int/sites/default/files/2021-07/eurocontrol-tod-manual-ed-3-0.pdf

1.3. Data quality requirements

1.3.1 The quality of aeronautical data is a direct safety determinant. Inaccurate, incomplete or untimely digital data sets can adversely affect the safety of air navigation. States and aeronautical information service providers therefore have an obligation to ensure that all digital data sets provided under this Plan meet the applicable quality requirements before being made available to users.

1.3.2 Data quality specifications for digital data sets include meeting accuracy, resolution, integrity, traceability, timeliness, completeness, and format requirements. These requirements are specified in ICAO Annex 15, Chapter 3, elaborated in PANS-AIM (Doc 10066), Section 5.3, and further developed in EUROCAE ED-76A / RTCA DO-200B — Standards for Processing Aeronautical Data. Non-compliant digital data setscan potentially affect the safety of air navigation.

1.4. Data product specification

1.4.1 Each provider of a digital data set shall publish a Data Product Specification (DPS) that enables users to evaluate the data set and determine whether it meets their requirements for a specific intended use. The DPS shall be prepared in accordance with ISO 19131 — Geographic Information: Data Product Specifications (SD 7, Appendix A) and PANS-AIM (Doc 10066), Section 5.3.4.

1.4.2 The availability of a DPS for each data set series shall be indicated in the national AIP, in section GEN 3.1.6. For data sets provided through information services, the DPS availability shall also be referenced in the relevant Information Service Overview, in accordance with PANS-AIM (Doc 10066), Section 5.4.2.

1.4.3 The data set provider shall notify users of DPS amendments in a timely manner. At a minimum:

- at least 12 months' advance notice shall be given for changes that require technical adaptations on client systems; and
- at least 56 days' advance notice shall be given for other significant structural or content changes.

1.4.4 Supporting guidance and worked examples of Data Product Specifications are provided in the EUROCONTROL Guidelines for Harmonised AIP Publication and Data Set Provision (SD 1, Appendix A) and in ISO 19131 — Geographic Information: Data Product Specifications (SD 7, Appendix A)

1.5. Metadata requirements for digital data sets

1.5.1 In accordance with ICAO Annex 15 para. 5.3.1.2 and PANS-AIM Section 5.3.2, each data set shall be provided to the next intended user together with at least the following minimum set of metadata:

a) the names of the organization or entities providing the data set;
b) the date and time when the data set was provided;
c) period of validity of the data set; and
d) any limitations with regard to the use of the data set.

1.5.2 Further guidance on metadata requirements, including additional metadata elements for Obstacle and Terrain data sets and metadata coding in accordance with ISO 19115, are provided in PANS-AIM (Doc 10066), Section 5.3.2, and ISO 19115 — Geographic Information: Metadata (SD 8, Appendix A). A worked example of AIP data set metadata coding is provided in Appendix C, Section 3 of this Plan.

1.6. Validation and verification of digital data sets

1.6.1 Data sets shall be verified and validated before being provided to the next intended users, in accordance with PANS-AIM Section 5.3.1.5/5.3.1.6.

1.6.2 For AIXM-encoded data sets, validation is a two-step process:

Step 1 — XML schema validation: The data set is checked for structural conformance with the AIXM XML schema.

Step 2 — Business rule verification: The data set is checked against aeronautical business rules expressed using the Semantics of Business Vocabulary and Rules (SBVR) standard.

1.6.3 Automated validation and verification rules for AIP and Obstacle data sets, are available at https://aixm.aero/page/data-verification

1.7. Omission of AIP Tables Following Data Set Provision

1.7.1 In accordance with PANS-AIM para. 5.2.1.1.3 (applicable from 27 November 2025), a State that provides a digital data set may omit the corresponding AIP tables from the printed/PDF AIP, provided that:

a) The digital data set fully covers the information that would otherwise appear in the AIP table;
b) Advance notice is published by means of an Aeronautical Information Circular (AIC) sufficiently in advance for users to adapt their systems — as a minimum, 56 days before the omission takes effect; and
c) The DPS is publicly available and referenced in AIP section GEN 3.1.6.

1.7.2 States shall indicate in their National Digital Data Set Implementation Plans (Appendix B) which AIP sections they intend to omit and the planned effective date.

1.7.3 The transition period applicable to each data set category is specified in the implementation table in Part III (*See Part III, Section 1, Table, Column 7 - Transition Period).*

1.7.4 Recommended Transition Steps" covering:

- Establish DPS and publish in AIP GEN 3.1.6
- Validate digital data set against AIXM schema and SBVR rules
- Issue AIC with 56-day advance notice
- Publish digital data set via agreed distribution mechanism
- Update NDIP to reflect omission decision

2. PROVISION OF TERRAIN AND OBSTACLE DATA (TOD)

2.1 The requirements for the provision of terrain and obstacle data (TOD) in electronic form are part of the transition from traditional AIS to Aeronautical Information Management (AIM). The purpose and context of TOD digital data sets, including their role in supporting ATM applications and safety systems, are described in Doc 9881, Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information.

2.2 TOD Relevant Areas , Surfaces and coverage

2.2.1 The geographic areas and three-dimensional surfaces that constitute the spatial scope of the ICAO TOD provisions defined in ICAO Annex 15, Annex 14, and Annex 4, and referenced in PANS-AIM are described in ICAO Doc 9881 — Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information (RD 8, Appendix A) and the EUROCONTROL Terrain and Obstacle Data Manual (SD 2, Appendix A).

2.2.2 ICAO Annex 15 (as amended by Amendment 33 and *incorporated in the 16th Edition and subsequent amendments*) defines four coverage areas for terrain and obstacle data:

a) Area 1: The entire territory of a State;
b) Area 2: The vicinity of an aerodrome (further sub-divided into Areas 2a–2d by Amendment 36);
c) Area 3: An area bordering the movement area on an aerodrome; and
d) Area 4: The radio altimeter operating area in front of a precision approach runway, Category II or III.

2.2.3 The detailed definitions and numerical requirements for each area are set out in ICAO Annex 15 para. 5.3.3.1 and PANS-AIM Appendix 8.

2.3 TOD Planning and Implementing steps

2.3.1 EUROCONTROL Terrain and Obstacle Data Manual , available at https://www.eurocontrol.int/publication/eurocontrol-terrain-and-obstacle-data-manual, outlines a recommended approach to planning and implementing terrain and obstacle data on a national basis. The steps described constitute a list of activities for States to coordinate the provision of TOD.

2.4 Terrain Digital Data sets Provision

2.5.1 AIXM 5.1 does not encompass terrain data. For terrain data sets, commonly used exchange formats are GeoTIFF, Digital Elevation Model (DEM) and Point Cloud (e.g., LiDAR-derived). Technical specifications, best practices, and packaging guidance for terrain data exchange are provided in the EUROCONTROL Terrain and Obstacle Data Manual (SD 2, Appendix A), available at https://www.eurocontrol.int/publication/eurocontrol-terrain-and-obstacle-data-manual. States should apply those specifications when producing and distributing terrain data sets.

2.5 Obstacle data set provision

2.5.2 The Aeronautical Information Exchange Model (AIXM) version 5.1 shall be used for modelling and encoding obstacle data in the MID Region. AIXM 5.1 supports all attributes required by PANS-AIM (Doc 10066) for the obstacle data set, including identification of new, edited, or deleted attributes.

2.5.3 Guidelines for a harmonized approach to the provision of an obstacle data set are set out in the EUROCONTROL Guidelines for Harmonised AIP Publication and Data Set Provision, available at : https://www.eurocontrol.int/publication/eurocontrol-guidelines-harmonised-aip-publication-and-data-set-provision

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2.6 Announcement of the TOD availability in the AIP

2.6.1 In accordance with PANS-AIM Appendix 2, the availability of terrain and obstacle data sets shall be announced in the national AIP in section GEN 3.1.6.

3. PROVISION OF AERODROME MAPPING DATA SETS (AMD)

3.1 Overview and Regulatory Basis

3.1.1 In accordance with ICAO Annex 14, aerodrome mapping data (AMD) should be made available to aeronautical information services for aerodromes where safety and/or performance-based operations indicate potential benefits.

3.1.2 An Aerodrome Mapping Database (AMDB) is an AMD set fulfilling the requirements of industry standards EUROCAE ED-99 / RTCA DO-272 (content requirements) and EUROCAE ED-119 / RTCA DO-291 (exchange requirements).

3.1.3 Aerodrome mapping data should be supported by electronic terrain and obstacle data for Area 3 to ensure consistency and quality of all geographic data associated with the aerodrome.

3.2 Coding specifications for Aerodrome Mapping Data Set

3.2.1 Coding specifications and supporting material for the encoding of AMD features in AIXM 5.1.1 , including aerodrome mapping data mappings between RTCA/EUROCAE industry standards and AIXM 5.1.1 features, and metadata aspects are provided at the AIXM web site at https://ext.eurocontrol.int/aixm_confluence/display/ACGAMD/Information+exchange+models.

3.3 Implementation Approach

3.3.1 AMD implementation shall follow a collaborative approach involving all relevant stakeholders. The primary responsibility for initiating AMD provision rests with the AISP, which may delegate data origination to the aerodrome operator.

3.3.2 Detailed implementation guidance, including step-by-step production workflows for each initiating scenario, is maintained by EUROCONTROL and shall be consulted by MID Region States and AISPs: *https://ext.eurocontrol.int/aixm_confluence/display/ACGAMD/Implementation*

4. PROVISION OF AERONAUTICAL INFORMATION PUBLICATION (AIP) DATA SETS

4.1 Introduction

4.1.1 The main purpose of the AIP Data Set is to ensure the minimum digital data necessary for efficiently and safely conducting flight planning and en-route air navigation. The intended use of the AIP data set, including its use by data service providers, air navigation service providers, and other State AIS, is described in PANS-AIM (Doc 10066), Section 5.2.1.

4.1.2 The content of an AIP Data Set is specified in PANS-AIM (Doc 10066) as a list of subjects and their properties, including airspace, routes, significant points, radio navigation and landing aids, and airport and runway data. The detailed scope applicable in the MID Region, including additional subjects identified through the MID Region gap analysis conducted by the AIMDP TF, is specified in Appendix C to this Plan.

4.2 Coding Specification for AIP Data Set

4.2.1 The Aeronautical Information Exchange Model (AIXM) provides a globally accepted data model and data coding format for the aeronautical data subjects contained in the AIP data set. AIP data set specimen ("DONLON" data) is available at : https://ext.eurocontrol.int/aixm_confluence/pages/viewpage.action?pageId=20415246

4.2.2 Common coding rules and guidelines for the provision of the AIP Data Set in AIXM 5.1(.1) format, with the aim of ensuring interoperability across the downstream AIS data chain, are available at https://ext.eurocontrol.int/aixm_confluence/display/ACGAIP/Introduction. The detailed PANS-AIM to AIXM 5.1/5.1.1 mapping applicable in the MID Region is provided in Appendix C to this Plan.

5. PROVISION OF INSTRUMENT FLIGHT PROCEDURE DATA SETS

5.1 Introduction

5.1.1 Instrument Flight Procedure (IFP) data sets are defined in ICAO Annex 15, 16th edition. Such data sets contain the departure, arrival and approach procedure data for airports used for international air traffic, as published in the AIP. PANS-AIM (Doc 10066) specifies the minimum subjects and properties to be included in IFP data sets.

5.2 Coding Specification for IFP data set

5.2.1 AIXM 5.2 should be considered for the provision of IFP data sets, as it introduces critical data elements in support of Performance-Based Navigation (PBN) procedures. States are encouraged to monitor developments through the AIXM Change Control Board at https://aixm.aero and to refer to the AIXM 5.2 release documentation available at https://aixm.aero/page/aixm-52 for technical information on AIXM versions.

5.2.2 Until formal IFP coding guidelines are published at global level, MID States providing IFP data sets should document their encoding approach in a Data Product Specification (DPS) in accordance with ISO 19131 — Geographic Information: Data Product Specifications (SD 7, Appendix A) and PANS-AIM (Doc 10066), Section 5.3.4, and notify the AIMDP TF accordingly.

PART III – COORDINATED DEPLOYMENT OF THE DIGITAL DATA SETS IN MID REGION

1. IMPLEMENTATION TIMELINE AND MILESTONES

The following table establishes the MID Region coordinated deployment framework for digital data sets, specifying what is to be provided, how it is to be provided, when provision is expected. The deployment framework encompasses the five digital data set categories. Implementation dates reflect the progressive regional timeline agreed by the AIMDP TF. States are strongly encouraged to implement as early as practicable within each window.

#	Data Set Category	Area / Scope	Format	Encoding / Coding Specification	Target Provision Window	AIP Omission Permissible?	Transition Period
1	Terrain data set	Area 1 — Entire State territory	GeoTIFF / DEM/Point Cloud	EUROCONTROL TOD Manual (SD 2, Appendix A); OGC GeoTIFF Standard (SD 6, Appendix A)	2020 – 2027	N/A	Not applicable
2	Terrain data set	Area 2a + Take-off flight path + OLS — International aerodromes	GeoTIFF /DEM/ Point Cloud	EUROCONTROL TOD Manual (SD 2, Appendix A); OGC GeoTIFF Standard (SD 6, Appendix A)	2020 – 2027	N/A	Not applicable
3	Terrain data set	Area 4 — CAT II/III aerodromes	GeoTIFF /DEM/Point Cloud	EUROCONTROL TOD Manual (SD 2, Appendix A); OGC GeoTIFF Standard (SD 6, Appendix A)	2020 – 2027	N/A	Not applicable
4	Terrain data set	Areas 2b, 2c, 2d, 3 — International aerodromes	GeoTIFF /DEM/Point Cloud	EUROCONTROL TOD Manual (SD 2, Appendix A); OGC GeoTIFF Standard (SD 6, Appendix A)	At State discretion	N/A	Not applicable
5	Obstacle data set	Area 1 — Entire State territory (ENR 5.4)	AIXM 5.1/5.1.1	EUROCONTROL AIXM obstacle coding guidelines	2020 – 2027	Yes	5 years from provision date
6	Obstacle data set	Areas 2a, 4, OLS + take-off flight path — International aerodromes (AD 2.10 / AD 3.10)	AIXM 5.1/5.1.1	EUROCONTROL AIXM obstacle coding guidelines	2020 – 2027	Yes	5 years from provision date
7	Obstacle data set	Areas 2b, 2c, 2d, 3 — International aerodromes	AIXM 5.1/5.1.1	EUROCONTROL AIXM obstacle coding guidelines	At State discretion	Yes	5 years from provision date
8	AIP data set	GEN, ENR, AD sections as specified in Part II, Section 4	AIXM 5.1/5.1.1	EUROCONTROL ACGAIP Specification + Appendix C	2026 – 2030	Yes	5 years from provision date
9	Aerodrome Mapping data set	International aerodromes	AIXM 5.1.1	EUROCONTROL ACGAMD Specification	2020 – 2027	N/A	Not applicable
10	IFP data set	All instrument procedures at international aerodromes	AIXM 5.2 (preferred) / AIXM 5.1.1 (interim)	AIXM 5.2 release documentation (https://aixm.aero/page/aixm-52)	2026 – 2031	Yes	5 years from provision date

Note 1: "Provision window" indicates the period within which States should achieve initial provision. States that have already achieved provision before 2025 are recognized as early implementers.
Note 2: "AIP Omission Permissible?" indicates whether the relevant PANS-AIM provisions permit omission of AIP content once the data set is provided. See Part II, Section 1.7.
Note 3: Terrain data sets are not subject to the AIP omission mechanism as terrain data does not appear as tables in the AIP.
Note 4: The format of the terrain data sets georeferencing information depends on the file format and that GeoTIFF/DEM/point cloud are only of the most common file formats.

2. DISTRIBUTION SERVICES

2.1 PANS-AIM (5.4.1.1) allows AIS products, including digital data sets, to be distributed either physically (e.g. by post) or electronically. Distribution via physical media (USB, DVD) is a temporary solution already used for AIP/eAIP.

2.2 In the context of evolving ATM requirements, the sharing of aeronautical information on a system-wide basis is essential to ensure comprehensive situational awareness across the ATM community. To fully support this objective, aeronautical information, including digital data sets, should be made available as System-Wide Information Management (SWIM) information services, thereby facilitating seamless and interoperable information exchange among all ATM system participants.

3. NATIONAL PLANS FOR THE PROVISION OF DIGITAL DATA SETS

3.1 Each member State shall prepare, maintain, and submit a National Digital Data Set Implementation Plan (NDIP), which translates the regional framework of this Plan into specific national commitments and timelines.

3.2 The NDIP shall be structured using the Excel template provided in Appendix B. The template covers the following elements:

Element	Content
1	Name of the State
2	AIP Data Set — provision date, encoding specification, remarks
3	Obstacle Data Set (Area 1) — provision date, format, remarks
4	Obstacle Data Sets — international aerodromes (Areas 2a, 4, OLS, and others as applicable)
5	IFP Data Sets — provision date, encoding format, aerodromes covered, remarks
6	Aerodrome Mapping Data Sets — provision date, aerodromes covered, remarks
7	Terrain Data Set (Area 1) — provision date, format, remarks
8	Terrain Data Sets — international aerodromes (Areas 2a, 4, OLS, and others)
9	AIP Omission Decision — list of AIP sections to be omitted and planned effective dates
10	Date of last update / review

3.3 Submission and Update Schedule

Initial NDIP submissions shall be made by the date confirmed by MIDANPIRG; thereafter, NDIPs shall be updated and re-submitted by 31 December each year.

NDIPs shall be updated at least annually, or immediately following any material change to a State's implementation position (e.g., change of provision date, change of encoding format, addition of a new aerodrome).

The ICAO MID Office shall maintain a central registry of NDIPs and publish a consolidated MID Region status dashboard on the ICAO MID website, updated following each AIM/SG meeting.

Appendix A – Regulatory and Guidance Material References

Regulatory References

Ref.	Document
RD 1	ICAO Annex 15 — Aeronautical Information Services, 16th Edition, 2018 (incorporating all amendments)
RD 2	ICAO Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066), 2nd Edition
RD 3	ICAO Aeronautical Information Services Manual (Doc 8126), 7th Edition, 2022
RD 4	ICAO Annex 14 — Aerodromes, Volume I, Aerodrome Design and Operations (current edition)
RD 5	ICAO Annex 4 — Aeronautical Charts (current edition)
RD 6	ICAO Manual on System-Wide Information Management (SWIM) Concept (Doc 10039), 1st Edition
RD 7	ICAO Procedures for Air Navigation Services — Information Management (PANS-IM, Doc 10199), 1st Edition
RD 8	ICAO Doc 9881 — Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information

Supporting References

Ref.	Document
SD 1	EUROCONTROL Guidelines for Harmonised AIP Publication and Data Set Provision (current edition), available at https://www.eurocontrol.int/publication/eurocontrol-guidelines-harmonised-aip-publication-and-data-set-provision
SD 2	EUROCONTROL Terrain and Obstacle Data Manual (current edition), available at https://www.eurocontrol.int/publication/eurocontrol-terrain-and-obstacle-data-manual
SD 3	EUROCONTROL Specification for AIS Data Sets in AIXM 5.1.1 (current edition)
SD 4	RTCA DO-272D / EUROCAE ED-99D — User Requirements for Aerodrome Mapping Information (current edition)
SD 5	RTCA DO-291B / EUROCAE ED-119B — Interchange Standards for Terrain, Obstacle, and Aerodrome Mapping Data (current edition)
SD 6	OGC GeoTIFF Standard (current edition), available at https://www.ogc.org/standards/geotiff
SD 7	ISO 19131 — Geographic information: Data product specifications (current edition)
SD 8	ISO 19115 — Geographic information: Metadata (current edition)
SD 9	ICAO Doc 9854 — Global Air Traffic Management Operational Concept, 1st Edition, 2005

Appendix B – NATIONAL DIGITAL DATA SET IMPLEMENTATION PLAN (NDIP) Standardised Template — Version 1.0, 2026

INSTRUCTIONS FOR USE

This template shall be completed by each member State and submitted to the ICAO MID Office no later than 31 December 2026. States shall use this template without structural modification. Requests for field additions shall be submitted to AIMDP TF for consideration.

National Plan for the provision of Digital Data Sets

National Plan Template for DDS pro

Appendix C - AIP Data set

1 Introduction

The context and rationale for the AIP data set, including the role of the 16th Edition of ICAO Annex 15 and PANS-AIM (Doc 10066) in enabling the transition from AIP table provision to digital data set provision, and the conditions under which States may omit AIP sections when equivalent digital data sets are made available, are described in PANS-AIM (Doc 10066), Section 5.2.1, and EUROCONTROL Guidelines for Harmonised AIP Publication and Data Set Provision (SD 1, Appendix A).

The following paragraphs specify the MID Region scope of the AIP data set, including:

a) The AIP sections that may be omitted when an AIP data set is provided, as specified in PANS-AIM para. 5.2.1.1.3, supplemented by additional sections identified through MID Region gap analysis; and

b) The AIXM 5.1/5.1.1 mapping applicable in the MID Region for encoding each subject and its properties.

1.1 AIP Data Set — Scope of Subjects

1.1.1 In accordance with PANS-AIM para. 5.2.1.1.3, when an AIP data set is provided, States may omit the following AIP sections from their AIP, provided that the information is available in the data set:

a)	GEN 2.5	List of radio navigation aids;
b)	ENR 2.1	FIR, UIR, TMA and CTA;
c)	ENR 3.1	Conventional navigation routes;
d)	ENR 3.2	Area navigation routes;
e)	ENR 3.5	Other routes;
f)	ENR 3.6	En-route holding;
g)	ENR 4.1	Radio navigation aids — en-route;
h)	ENR 4.2	Special navigation systems;
i)	ENR 4.4	Name-code designators for significant points;
j)	ENR 4.5	Aeronautical ground lights – en-route;
k)	ENR 5.1	Prohibited, restricted and danger areas;
l)	ENR 5.2	Military exercise and training areas and air defence identification zone (ADIZ);
m)	ENR 5.3.1	Other activities of a dangerous nature;
n)	ENR 5.3.2	Other potential hazards;
o)	ENR 5.5	Aerial sporting and recreational activities;
p)	AD 2.17	Air traffic services airspace;
q)	AD 2.19	Radio navigation and landing aids;
r)	AD 3.16	Air traffic services airspace (Heliports);
s)	AD 3.18	Radio navigation and landing aids (Heliports);

Note: The list reproduces PANS-AIM para. 5.2.1.1.3 for ease of reference. The PANS-AIM provision is authoritative. Where the PANS-AIM text and this list differ, the PANS-AIM text prevails. The effective date of this provision is 27 November 2025.

1.1.2 Through a MID Region gap analysis, the following additional AIP sections have been identified as containing data that can be systematically encoded in AIXM 5.1/5.1.1 and should be included in the MID Region AIP data set scope, beyond the minimum required by PANS-AIM para. 5.2.1.1.3:

(1)	AD 1.3	Index to Aerodromes/Heliports
(2)	AD 1.5	Status of certification of aerodromes
(3)	AD 2.1	Aerodrome location/ indicator and name

(4) AD 2.2 Aerodrome geographical and administrative data
(5) AD 2.12 Runway Physical Characteristics
(6) AD 2.13 Declared Distances
(7) AD 2.14 Approach and Runway Lighting
(8) AD 2.15 Other Lighting, Secondary Power Supply
(9) AD 2.16 Helicopter Landing Area
(10) AD 3.1 Heliport location indicator and name
(11) AD 3.2 Heliport geographical and admin data

Note: The inclusion of these additional sections in the MID Region AIP data set scope is a MID Region-specific provision, agreed by the AIMDP TF. It is consistent with, and extends, the minimum scope specified in PANS-AIM para. 5.2.1.1.3. States are encouraged to include these sections in their AIP data set implementations in order to maximise the value and completeness of data set provision."

1.1.3 Minimum Subject Properties (PANS-AIM para. 5.3.3.1.1)

The AIP data set shall include data about the following subjects, with the properties indicated in brackets being included as a minimum (if applicable):

a) Air traffic services (ATS) Airspace (type, name, lateral limits, vertical limits, class of airspace);
b) Special activity airspace (type, name, lateral limits, vertical limits, restriction, activation);
c) ATS route and other route (designator, flight rules);
d) Route segment (navigation specification, from point, to point, track, length, upper limit, lower limit, minimum en-route altitude (MEA), minimum obstacle clearance altitude (MOCA), direction of cruising level, required navigation performance);
e) Waypoint – en-route (identification, location, formation);
f) Aerodrome/Heliport (ICAO location indicator, name, designator IATA, served city, certified ICAO, certification date, certification expiration date, control type, field elevation, reference temperature, magnetic variation, reference point);
g) Runway (designator, nominal length, nominal width, surface type, strength);
h) Runway Direction (designator, true bearing, threshold, take off run available (TORA), take-off distance available (TODA), accelerate-stop distance available (ASDA), landing distance available (LDA));
i) Final approach and take-off (FATO) (designation, length, width, threshold point);
j) Touchdown and left-off (TLOF) (designator, centre point, length, width, surface type);
k) Radio navigation aid (type, identification, name, aerodrome/heliport served, hours of operation, magnetic variation, frequency/channel, position, elevation, magnetic bearing, true bearing, zero bearing direction).

All lines a) to k) supplemented by the below (1) & (2) are considered as part of mapping – for details, refer to the paragraph that follows.
(1) Aeronautical Ground Lights (type, designator, name, intensity, characteristics, hours of operations, position)
(2) En-route Holding (fix, waypoint, inbound track, turn direction, speed, minimum/maximum holding level, time/distance outbound, special instruction, controlling unit name/frequency)

Note: The highlighted lines are the AIP sections (paragraph 1.1.1 of this Appendix) and list of properties (paragraph 1.1.2 of this Appendix) respectively that are identified during internal "gap analysis" in order to assure the consistency in information and content with AIP when delivering the digital AIP Data set files.

2 Mapping PANS AIM and AIP Data set to AIXM 5.1/AIXM 5.1.1 Model

The following AIXM 5.1/5.1.1 mapping tables specify how each PANS-AIM AIP data set subject and its properties shall be encoded in the MID Region AIP data set. These mapping tables are derived from and consistent with the EUROCONTROL AIP Data Set coding guidelines, and have

been adapted where necessary to reflect MID Region-specific requirements or to address gaps identified in the coding guidelines.

2.1 ATS airspace

The mapping will be for the content of sections (ICAO Doc. 10066 PANS-AIM paragraph 5.2.1.1.3) respectively:

- ✓ ENR 2.1 FIR, UIR, TMA and CTA - *line b);*
- ✓ AD 2.17 ATS Airspace - *line p);*
- ✓ AD 3.16 ATS Airspace*, line r);*

AIXM 5.1/AIXM 5.1.1 Mapping details:

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Type	Airspace.type, and/or Airspace.localType
Name	Airspace.name, and/or Airspace.designator
Lateral Limits	(Airspace.AirspaceVolume.horizontalProjection.Surface, Airspace.AirspaceVolume.horizontalProjection.Surface.horizontalAccuracy) or (Airspace.AirspaceVolume.centreline.Curve, Airspace.AirspaceVolume.centreline.Curve.horizontalAccuracy, Airspace.AirspaceVolume.width)
Vertical Limit – Upper Limit	Airspace.AirspaceVolume.upperLimit, Airspace.AirspaceVolume.upperLimitReference
Vertical Limit – Lower Limit	Airspace.AirspaceVolume.lowerLimit, Airspace.AirspaceVolume.lowerLimitReference and/or AirspaceVolume.annotation.Note.namedProperty equal to 'lowerLimit' .translatedNote.LinguisticNote.note PANS-AIM defines an accuracy for the lower limit of an ATS airspace. There is no dedicated attribute in AIXM 5.1.1. Workaround: A **Note** may be used to encode that information.
Class of Airspace	Airspace.class.AirspaceLayerClass.classification
Class – Upper Limit	Airspace.class.AirspaceLayerClass.associatedLevels.AirspaceLayer.upperLimit
Class – Lower Limit	Airspace.class.AirspaceLayerClass.associatedLevels.AirspaceLayer.lowerLimit

PANS-AIM	AIXM 5.1/AIXM 5.1.1
ATS Unit	(SearchRescueService.clientAirspace, SearchRescueService.serviceProvider) and/or (InformationService.clientAirspace, InformationService.serviceProvider) and/or (AirTrafficControlService.clientAirspace, AirTrafficControlService.serviceProvider)
ATS Unit Name	Unit.name and/or (SearchRescueService.name) and/or (InformationService.name) and/or (AirTrafficControlService.name)
ATS Unit Call sign	SearchRescueService.call-sign.CallsignDetail.callSign and/or InformationService.call-sign.CallsignDetail.callSign and/or AirTrafficControlService.call-sign.CallsignDetail.callSign
ATS Unit Language	SearchRescueService.call-sign.CallsignDetail.language and/or InformationService.call-sign.CallsignDetail.language and/or AirTrafficControlService.call-sign.CallsignDetail.language
ATS Unit Applicability	SearchRescueService.annotation.Note and/or InformationService.annotation.Note and/or AirTrafficControlService.annotation.Note and/or Airspace.annotation.Note
Frequency	AirTrafficControlService.radioCommunication and/or InformationService.radioCommunication and/or SearchRescueService.radioCommunication
Frequency Value	RadioCommunicationChannel.frequencyTransmission and/or RadioCommunicationChannel.frequencyReception

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Frequency Purpose	RadioCommunicationChannel.rank
SATVOICE number	AirTrafficControlService.annotation.Note and/or InformationService.annotation.Note and/or SearchRescueService.annotation.Note
SATVOICE number value	AirTrafficControlService.annotation.Note and/or InformationService.annotation.Note and/or SearchRescueService.annotation.Note
SATVOICE number purpose	AirTrafficControlService.annotation.Note and/or InformationService.annotation.Note and/or SearchRescueService.annotation.Note
ATS Unit hour of service	SearchRescueService.availability.ServiceOperationalStatus.timeInterval and/or InformationService.availability.ServiceOperationalStatus.timeInterval and/or AirTrafficControlService.availability.ServiceOperationalStatus.timeInterval
Hours of applicability	Airspace.activation.AirspaceActivation.timeInterval
Transition altitude	AirportHeliport.transitionAltitude
Nav Spec	Airspace.annotation[purpose='OTHER:NAV_SPEC'].Note
Remarks	Airspace.annotation

2.2 Special Activity Airspace

The mapping will be for the content of the following sections (ICAO Doc. 10066 PANS-AIM paragraph 5.2.1.1.3) respectively:

- ✓ ENR 5.1 Prohibited, restricted and danger areas – *line k);*
- ✓ ENR 5.2 Military exercise and training areas/Air Defence Identification Zone (ADIZ) - *line l);*
- ✓ ENR 5.3.1 Other activities of a dangerous nature – *line m);*
- ✓ ENR 5.3.2 Other potential hazards – *line n)*;
- ✓ ENR 5.5 Aerial sporting and recreational activities – *line o);*

AIXM 5.1/AIXM 5.1.1 Mapping details

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Type	Airspace.type and/or Airspace.localType

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Identification/Designator	Airspace.designator
Name	Airspace.name
Lateral Limits	(Airspace.AirspaceVolume.horizontalProjection.Surface, Airspace.AirspaceVolume.horizontalProjection.Surface.horizontalAccuracy) Or (Airspace.AirspaceVolume.centreline.Curve, Airspace.AirspaceVolume.centreline.Curve.horizontalAccuracy, Airspace.AirspaceVolume.width)
Vertical Limits – Upper Limit	Airspace.AirspaceVolume.upperLimit, Airspace.AirspaceVolume.upperLimitReference
Vertical Limits – Lower Limit	Airspace.AirspaceVolume.lowerLimit, Airspace.AirspaceVolume.lowerLimitReference
Restriction	Airspace.activation.AirspaceActivation.activity
Activation	Airspace.annotation[propertyName='activation'].Note
Time of activity	Airspace.activation.AirspaceActivation.timeInterval
Risk of interception	Airspace.annotation.Note
Advisory measures	Airspace.annotation.Note
Authority responsible for provision of information	**Option 1:** AuthorityForAirspace.assignedAirspace AuthorityForAirspace.responsibleOrganisation **Option 2:** Airspace.activation.AirspaceActivation.user **Option 3** (*in case Frequency needs to be encoded*): (SearchRescueService.clientAirspace, SearchRescueService.serviceProvider, SearchRescueService.radioCommunication) Or (InformationService.clientAirspace, InformationService.serviceProvider, InformationService.radioCommunication) Or (AirTrafficControlService.clientAirspace, AirTrafficControlService.serviceProvider, AirTrafficControlService.radioCommunication)

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Operator	**Option 1:** Airspace.activation.AirspaceActivation.user, OrganisationAuthority.contact.ContactInformation.phoneFax.TelephoneContact.voice **Option 2** (*in case Frequency has to be defined*): (AirTrafficControlService.clientAirspace, AirTrafficControlService.groundCommunication.ContactInformation.phoneFax.TelephoneContact.voice) Or (InformationService.clientAirspace, InformationService.groundCommunication.ContactInformation.phoneFax.TelephoneContact.voice) Or (SearchRescueService.clientAirspace, SearchRescueService.groundCommunication.ContactInformation.phoneFax.TelephoneContact.voice)

2.3 ATS Route and other routes

The mapping will be for the content of the following sections (ICAO Doc. 10066 PANS-AIM paragraph 5.2.1.1.3) respectively:

- ✓ ENR 3.1 Conventional navigation routes – *line c);*
- ✓ ENR 3.2 Area navigation routes – *line d);*
- ✓ ENR 3.5 Other routes – *line e);*

AIXM 5.1/AIXM 5.1.1 Mapping details

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Designator (ATS Route), Designator (Other Route)	Route.designatorPrefix and/or (Route.designatorSecondLetter, Route.designatorNumber) and/or RouteSegment.designatorSuffix and/or Route.multipleIdentifier
Flight rules	Route[flightRule='IFR'] .flightRule
ATS Routes, Other Route	Route[type='ATS'].type, Route[contains(type, 'OTHER:')].type
Remarks	Route.annotation

2.4 Route segment

The mapping will be for the content of the following sections (ICAO Doc. 10066 PANS-AIM paragraph 5.2.1.1.3) respectively:

- ✓ ENR 3.1 Conventional navigation routes – *line c);*
- ✓ ENR 3.2 Area navigation routes – *line d);*
- ✓ ENR 3.5 Other routes – *line e);*

AIXM 5.1/AIXM 5.1.1 Mapping details

PANS-AIM	**AIXM 5.1/AIXM 5.1.1**
Navigation Specification	RouteSegment.navigationType The current AIXM 5.1.1 version does not support all PBN values. The navigationType attribute of AIXM only provides as values 'RNAV', 'CONV' and 'TACAN', but no PBN specifications (such as RNAV 10 , RNP 4 etc). Most missing PBN values can be coded using navigationType equal to 'RNAV' or 'OTHER:RNP' and requiredNavigationPerformance with the navigation accuracy value, e.g. '10' or '4'.
Navigation Performance	RouteSegment.requiredNavigationPerformance
From point – Designator	RouteSegment.start.EnRouteSegmentPoint.pointChoice_navaidSystem or RouteSegment.start.EnRouteSegmentPoint.pointChoice_fixDesignatedPoint or RouteSegment.start.EnRouteSegmentPoint.pointChoice_airportReferencePoint For the mapping the assumption is made that RunwayCentrelinePoint, TouchDownLiftOff, AirportHeliport and Point are not used as "From" point.
From point – Reporting	RouteSegment.start.EnRouteSegmentPoint.reportingATC
To point – Designator	RouteSegment.end.EnRouteSegmentPoint.pointChoice_navaidSystem or RouteSegment.end.EnRouteSegmentPoint.pointChoice_fixDesignatedPoint or RouteSegment.end.EnRouteSegmentPoint.pointChoice_airportReferencePoint
To point – Reporting	RouteSegment.end.EnRouteSegmentPoint.reportingATC
Track	RouteSegment.trueTrack and/or RouteSegment.reverseTrueTrack and/or RouteSegment.magneticTrack and/or RouteSegment.reverseMagneticTrack
Length	RouteSegment.length, RouteSegment.pathType PANS-AIM requires an accuracy to be specified for the Airway segments length. AIXM 5.1.1 does not have a dedicated attribute for that purpose. Workaround for AIXM 5.1(.1): Code a corresponding **Note.**
Upper limit	RouteSegment.upperLimit, RouteSegment.upperLimitReference

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Lower limit	RouteSegment.lowerLimit, RouteSegment.lowerLimitReference
Minimum En route Altitude	RouteSegment.minimumEnrouteAltitude and RouteSegment.annotation.Note.propertyName value equal-to 'minimumEnrouteAltitude' PANS-AIM requires a accuracy to be specified for the MEA. AIXM 5.1.1 does not have a dedicated attribute for that purpose. Workaround for AIXM 5.1(.1): Code a corresponding **Note**.
Minimum Obstacle Clearance Altitude	RouteSegment.minimumObstacleClearanceAltitude and RouteSegment.annotation.Note.propertyName value equal-to 'minimumObstacleClearanceAltitude' PANS-AIM requires a accuracy to be specified for the MEA. AIXM 5.1.1 does not have a dedicated attribute for that purpose. Workaround for AIXM 5.1(.1): Code a corresponding **Note.**
Minimum flight altitude	(RouteSegment.minimumObstacleClearanceAltitude and RouteSegment.annotation.Note.propertyName value equal-to 'minimumObstacleClearanceAltitude') or (RouteSegment.minimumEnrouteAltitude And RouteSegment.annotation.Note.propertyName value equal-to 'minimumEnrouteAltitude') AIXM 5.1.1 does not have a dedicated attribute for that purpose. As, in PANS-AIM there is no definition for Minimum flight altitude. For this mapping it is assumed that it may be the either the MEA or the MOCA for helicopters. Workaround for AIXM 5.1(.1): Code a RouteSegment.minimumObstacleClearanceAltitude, or RouteSegment.minimumEnrouteAltitude
Lateral Limits	RouteSegment.widthLeft, RouteSegment.widthRight
Direction of cruise levels – Forward	RouteSegment.availability.RouteAvailability[direction='FORWARD'].levels.AirspaceLayer.discreteLevelSeries.series
Direction of cruise levels – Backward	RouteSegment.availability.RouteAvailability[direction='BACKWARD'].levels.AirspaceLayer.discreteLevelSeries.series
Class of airspace	RouteSegment.availability.RouteAvailability.levels.AirspaceLayer.annotation[purpose='OTHER:CLASS'].Note

PANS-AIM	AIXM 5.1/AIXM 5.1.1
PBN requirements - Sensor requirements	Option RouteSegment.annotation[purpose='OTHER:PBN'].Note
Controlling unit	(SearchRescueService.clientRoute.RoutePortion, SearchRescueService.serviceProvider) and/or (InformationService.clientRoute.RoutePortion, InformationService.serviceProvider) and/or (AirTrafficControlService.clientRoute.RoutePortion, AirTrafficControlService.serviceProvider)
Controlling unit – Name	(InformationService.serviceProvider and/or AirTrafficControlService.serviceProvider), Unit.name
Controlling unit – Channel	(AirTrafficControlService.radioCommunication, and/or InformationService.radioCommunication, and/or SearchRescueService.radioCommunication) and (RadioCommunicationChannel.frequencyTransmission, and/or RadioCommunicationChannel.frequencyReception, and/or RadioCommunicationChannel.channel)
Controlling unit - Logon address	Unit.contact.ContactInformation InformationService For TrafficSeperationService two dedicated attributes are provided: dataLinkEnable and dataLinkChannel. For InformationService only one attribute datalink is provided. In addition it is possible to encode datalink information for an Unit via the object OnlineContact using the attributes linkage, network and protocol.
Change over point	ChangeOverPoint.distance, ChangeOverPoint.applicableRoutePortion, ChangeOverPoint.location_position
Restrictions	RouteSegment.annotation,
Availability	RouteSegment.availability.RouteAvailability.timeInterval RouteSegment.availability.RouteAvailability.status

2.5 Waypoint – en-route

The mapping will be for the content of the following sections (ICAO Doc. 10066 PANS-AIM paragraph 5.2.1.1.3) respectively:

- ✓ ENR 4.4 Name Code Designators for Significant Point – *line i);*

AIXM 5.1/AIXM 5.1.1 Mapping details

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Identification	DesignatedPoint.designator, DesignatedPoint.name
Position	DesignatedPoint.location, DesignatedPoint.location.horizontalAccuracy
Formation – Navaid	AngleIndication.pointChoice_navaidSystem and/or DistanceIndication.pointChoice_navaidSystem
Formation – Bearing	AngleIndication.angle and/or AngleIndication.angleType and/or AngleIndication.trueAngle and/or AngleIndication[indicationDirection='FROM'].fix, and/or AngleIndication.annotation[propertyName='angle'].Note
Formation – Distance	DistanceIndication.distance, and/or DistanceIndication.fix, and/or DistanceIndication.annotation[propertyName='distance'].Note
Reference to route	RouteSegment.routeFormed, RouteSegment.start.EnRouteSegmentPoint.pointChoice_fixDesignatedPoint, RouteSegment.end.EnRouteSegmentPoint.pointChoice_fixDesignatedPoint
Terminal Area	DesignatedPoint.annotation

2.6 Aerodrome / Heliport

The mapping will be for the following sections (ICAO Doc. 10066 PANS-AIM paragraph 5.2.1.1.3) respectively:

- ✓ AD 1.3 “Index to Aerodromes/Heliports”, – new line (1);
- ✓ AD 1.5 “Status of certification of aerodromes”, – new line (2);
- ✓ AD 2.1 “Aerodrome location indicator and name”, – new line (3);
- ✓ AD 2.2 “Aerodrome geographical and administrative data, – new line (4);
- ✓ AD 2.15 “Other Lighting, Secondary Power Supply, – new line (8);

- ✓ AD 3.1 “Heliport location indicator and name, – new line (10);
- ✓ AD 3.2 “Heliport geographical and admin data”, – new line (11);

AIXM 5.1/AIXM 5.1.1 Mapping details

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Aerodrome/Heliport	AirportHeliport.type
Designator - ICAO location indicator	AirportHeliport.locationIndicatorICAO, AirportHeliport.designator
Designator - Designator IATA	AirportHeliport.designatorIATA, AirportHeliport.designator
Designator – Other	AirportHeliport.designator
Name	AirportHeliport.name
Served city	AirportHeliport.servedCity.City.name,
Administrative authority	AirportHeliport.responsibleOrganisation.theOrganisationAuthority, OrganisationAuthority.name, OrganisationAuthority.designator, OrganisationAuthority.contact
Control type	AirportHeliport.controlType
Certified ICAO	AirportHeliport.certifiedICAO
Certification date	AirportHeliport.certificationDate
Certification expiration date	AirportHeliport.certificationExpirationDate
Field elevation – Elevation	AirportHeliport.fieldElevation, AirportHeliport.fieldElevationAccuracy
Field elevation - Geoid undulation	AirportHeliport.ARP.ElevatedPoint.geoidUndulation
Reference temperature	AirportHeliport.referenceTemperature
Magnetic variation – Angle	AirportHeliport.magneticVariation, AirportHeliport.magneticVariationAccuracy
Magnetic variation – Date	AirportHeliport.dateMagneticVariation
Magnetic variation - Annual change	AirportHeliport.magneticVariationChange
Airport reference point – Position	AirportHeliport.ARP.ElevatedPoint, AirportHeliport.ARP.ElevatedPoint.horizonalAccuracy,
A reference surface	AirportHeliport.verticalDatum
Airport reference point – Site	AirportHeliport.annotation[propertyName=‘arp'].Note
Airport reference point – Direction	AirportHeliport.annotation[propertyName=‘arp'].Note
Airport reference point – Distance	AirportHeliport.annotation[propertyName=‘arp'].Note

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Type of Traffic Permitted - IFR/VFR/International/National/Schedule/Non Schedule/Private	AirportHeliport.availability.AirportHeliportAvailability.usage.AirportHeliportUsage.selection.ConditionCombination.flight.FlightCharacteristic.rule, AirportHeliport.availability.AirportHeliportAvailability.usage.AirportHeliportUsage.selection.ConditionCombination.flight.FlightCharacteristic.military, AirportHeliport.availability.AirportHeliportAvailability.usage.AirportHeliportUsage.selection.ConditionCombination.flight.FlightCharacteristic.origin, AirportHeliport.availability.AirportHeliportAvailability.usage.AirportHeliportUsage.selection.ConditionCombination.flight.FlightCharacteristic.purpose
checking of an altimeter system can be accomplished	AirportHeliport.altimeterCheckLocation
windDirectionIndicator	AirportHeliport .windDirectionIndicator
landingDirectionIndicator	AirportHeliport.landingDirectionIndicator
transitionAltitude	AirportHeliport transitionAltitude
transitionLevel	AirportHeliport transitionLevel
lowestTemperature	AirportHeliport lowestTemperature
abandoned	AirportHeliport abandoned
ABN/IBN location, characteristics and operational hours	AeronauticalGroundLight[type='IBN'] Or AeronauticalGroundLight[type='ABN'], AeronauticalGroundLight.location.ElevatedPoint, AeronauticalGroundLight.colour, AeronauticalGroundLight.flashing, AeronauticalGroundLight.annotation, AeronauticalGroundLight.aerodromeBeacon
LDI location and LGT	AirportHeliport.annotation[propertyName='landingDirectionIndicator'][purpose='DESCRIPTION'].Note
Anemometer location and LGT	AirportHeliport.annotation[pupose='OTHER:Anemometer'].Note
TWY lighting	TaxiwayLightSystem[position='EDGE'] Or TaxiwayLightSystem[position='CL'] Or TaxiwayLightSystem[position='OTHER:floodlight'], TaxiwayLightSystem.intensityLevel, TaxiwayLightSystem.colour, TaxiwayLightSystem.position, TaxiwayLightSystem.element.LightElement.type, TaxiwayLightSystem.lightedTaxiway and Taxiway.designator, Taxiway.width, Taxiway.surfaceProperties.SurfaceCharacteristics.composition, Taxiway.surfaceProperties.SurfaceCharacteristics.classPCN, Taxiway.surfaceProperties.SurfaceCharacteristics.pavementTypePCN, Taxiway.surfaceProperties. SurfaceCharacteristics.pavementSubgradePCN, Taxiway.surfaceProperties. SurfaceCharacteristics.maxTyrePressurePCN, Taxiway.surfaceProperties. SurfaceCharacteristics.evaluationMethodPCN, Taxiway.associatedAirportHeliport
Secondary power supply/switch-over time	AirportHeliport.annotation[propertyName='secondaryPowerSupply'][purpose='DESCRIPTION'].Note
Remarks	AirportHeliport.annotation.Note

2.7 Runway

The mapping will be for the following sections (ICAO Doc. 10066 PANS-AIM paragraph 5.2.1.1.3) respectively:

- ✓ AD 2.12 “Runway Physical Characteristics” – new line (5);
- ✓ AD 2.14 “Approach and Runway Lighting” – new line (7);

AIXM 5.1/AIXM 5.1.1 Mapping details

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Designator	Runway.designator
Type	Runway.[type=’RWY’]
Nominal length	Runway.nominalLength, Runway.lengthAccuracy
Nominal width	Runway.nominalWidth, Runway.widthAccuracy
Surface type	Runway.surfaceProperties.SurfaceCharacteristics.composition
Strength – PCN	Runway.surfaceProperties.SurfaceCharacteristics.classPCN
Strength - Pavement type	Runway.surfaceProperties.SurfaceCharacteristics.pavementTypePCN
Strength - Subgrade category	Runway.surfaceProperties.SurfaceCharacteristics.pavementSubgradePCN
Strength - Allowable pressure	Runway.surfaceProperties.SurfaceCharacteristics.maxTyrePressurePCN
Strength - Evaluation method	Runway.surfaceProperties.SurfaceCharacteristics.evaluationMethodPCN
Shoulder - Width	Runway.widthShoulder
Runway geometry	RunwayElement[type=’NORMAL’], RunwayElement.associatedRunway, RunwayElement.extent
Strip Length	Runway.lengthStrip
Strip Width	Runway.widthStrip
Shoulder Type	RunwayElement[type=’SHOULDER’], RunwayElement.associatedRunway
Shoulder Geometry	RunwayElement[type=’SHOULDER’], RunwayElement.associatedRunway, RunwayElement.extent
Runway Remarks	Runway.annotation
OFZ	RunwayProtectArea[type=’OFZ’], RunwayProtectArea.annotation
Runway Approach light intensity, type & length	ApproachLightingSystem.intensityLevel, ApproachLightingSystem.type, ApproachLightingSystem.length, ApproachLightingSystem.servedRunwayDirection
Threshold colour	RunwayDirectionLightSystem[position=’THR’], RunwayDirectionLightSystem.colour, RunwayDirectionLightSystem.associatedRunwayDirection

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Threshold wing bar	RunwayDirectionLightSystem[position='END'], RunwayDirectionLightSystem.colour, RunwayDirectionLightSystem.annotation[purpose= 'OTHER:WING_BAR_DESC'].Note RunwayDirectionLightSystem.associatedRunwayDirection
Visual approach slope indicator systems type, position, slope & Minimum eye height over threshold	VisualGlideSlopeIndicator.type, VisualGlideSlopeIndicator.position, VisualGlideSlopeIndicator.slopeAngle, VisualGlideSlopeIndicator.minimumEyeHeightOverThreshold, VisualGlideSlopeIndicator.runwayDirection
Runway Touchdown zone light system	RunwayDirectionLightSystem[position='TDZ'], RunwayDirectionLightSystem.colour, RunwayDirectionLightSystem.intensityLevel, RunwayDirectionLightSystem.annotation, RunwayDirectionLightSystem.associatedRunwayDirection
Runway Center Line Light system	RunwayDirectionLightSystem[position='CL'], RunwayDirectionLightSystem.colour, RunwayDirectionLightSystem.intensityLevel, RunwayDirectionLightSystem.annotation, RunwayDirectionLightSystem.associatedRunwayDirection
Runway Edge Light System	RunwayDirectionLightSystem[position='EDGE'], RunwayDirectionLightSystem.colour, RunwayDirectionLightSystem.intensityLevel, RunwayDirectionLightSystem.annotation, RunwayDirectionLightSystem.associatedRunwayDirection
RWY End LGT colour WBAR	RunwayDirectionLightSystem[position='END'], RunwayDirectionLightSystem.colour, RunwayDirectionLightSystem.intensityLevel, RunwayDirectionLightSystem.annotation[purpose= 'OTHER:WING_BAR_DESC'].Note, RunwayDirectionLightSystem.associatedRunwayDirection
Stopway Light System	RunwayProtectAreaLightSystem[position='CL'] Or RunwayProtectAreaLightSystem[position='END'] Or RunwayProtectAreaLightSystem[position='EDGE'], RunwayProtectAreaLightSystem.colour, RunwayProtectAreaLightSystem.intensityLevel, RunwayProtectAreaLightSystem.annotation, RunwayProtectAreaLightSystem.lightedArea
Runway Direction Light System Remarks	RunwayDirectionLightSystem.annotation

2.8 Runway Direction

The mapping will be for the following sections (ICAO Doc. 10066 PANS-AIM paragraph 5.2.1.1.3) respectively:

- ✓ AD 2.12 "Runway Physical Characteristics", - new line (5);
- ✓ AD 2.13 "Declared Distances", – new line (6);

AIXM 5.1/AIXM 5.1.1 Mapping details

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Designator	RunwayDirection.designator
True bearing	RunwayDirection.trueBearing, RunwayDirection.trueBearingAccuracy
MagneticBreaing	RunwayDirection.magneticBearing
Threshold - Position	RunwayCentrelinePoint.location.ElevatedPoint, RunwayCentrelinePoint.location.ElevatedPoint.horizontalAccuracy
Threshold - Elevation	RunwayCentrelinePoint.location.ElevatedPoint.elevation, RunwayCentrelinePoint.location.ElevatedPoint.verticalAccuracy
Threshold - Geoid undulation	RunwayCentrelinePoint.location.ElevatedPoint.geoidUndulation, RunwayCentrelinePoint.location.ElevatedPoint.verticalAccuracy
Threshold - Type	RunwayCentrelinePoint[role='DISTHR'].role Or RunwayCentrelinePoint[role='THR'].role Or RunwayCentrelinePoint[role='END'].role Or RunwayCentrelinePoint[role='TDZ'].role
Runway Slope	RunwayDirection.annotation[purpose='OTHER:RWY_SLOPE'].Note
Stopway Slope	RunwayDirection.annotation[purpose= 'OTHER:SWY_SLOPE'].Note
Threshold - Displacement	RunwayCentrelinePoint[role='DISTHR'].associatedDeclaredDistance.RunwayDeclaredDistance[type='DTHR'].declaredValue.RunwayDeclaredDistanceValue.distance, RunwayCentrelinePoint[role='DISTHR'].associatedDeclaredDistance.RunwayDeclaredDistance[type='DTHR'].declaredValue.RunwayDeclaredDistanceValue.distanceAccuracy
Declared distance - TORA	RunwayCentrelinePoint.role.associatedDeclaredDistance.RunwayDeclaredDistance[type='TORA'].declaredValue.RunwayDeclaredDistanceValue.distance, RunwayCentrelinePoint.role.associatedDeclaredDistance.RunwayDeclaredDistance[type='TORA'].declaredValue.RunwayDeclaredDistanceValue.distanceAccuracy
Declared distance - TODA	RunwayCentrelinePoint.role.associatedDeclaredDistance.RunwayDeclaredDistance[type='TODA'].declaredValue.RunwayDeclaredDistanceValue.distance, RunwayCentrelinePoint.role.associatedDeclaredDistance.RunwayDeclaredDistance[type='TODA'].declaredValue.RunwayDeclaredDistanceValue.distanceAccuracy
Declared distance - ASDA	RunwayCentrelinePoint.role.associatedDeclaredDistance.RunwayDeclaredDistance[type='ASDA'].declaredValue.RunwayDeclaredDistanceValue.distance, RunwayCentrelinePoint.role.associatedDeclaredDistance.RunwayDeclaredDistance[type='ASDA'].declaredValue.RunwayDeclaredDistanceValue.distanceAccuracy

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Declared distance - LDA	RunwayCentrelinePoint.role.associatedDeclaredDistance.RunwayDeclaredDistance[type='LDA'] .declaredValue.RunwayDeclaredDistanceValue.distance, RunwayCentrelinePoint.role.associatedDeclaredDistance.RunwayDeclaredDistance[type='LDA'] .declaredValue.RunwayDeclaredDistanceValue.distanceAccuracy
Declared distances - Remarks	RunwayCentrelinePoint.associatedDeclaredDistance.RunwayDeclaredDistance.annotation Or RunwayCentrelinePoint.associatedDeclaredDistance.RunwayDeclaredDistance.declaredValue.RunwayDeclaredDistanceValue.annotation
STOPWAY	RunwayProtectArea[type =’STOPWAY’].width, RunwayProtectArea[type =’STOPWAY’].length, RunwayProtectArea[type =’STOPWAY’].lighting, RunwayProtectArea[type =’STOPWAY’].surfaceProperties, RunwayProtectArea[type =’STOPWAY’].protectedRunwayDirection
CLEARWAY	RunwayProtectArea[type =’CWY’].width, RunwayProtectArea[type =’CWY’].length, RunwayProtectArea[type =’CWY’].lighting, RunwayProtectArea[type =’CWY’].surfaceProperties, RunwayProtectArea[type =’CWY’].protectedRunwayDirection
Runway End safety Area	RunwayProtectArea[type =’RESA’].width, RunwayProtectArea[type =’RESA’].length, RunwayProtectArea[type =’RESA’].lighting, RunwayProtectArea[type =’RESA’].surfaceProperties, RunwayProtectArea[type =’RESA’].protectedRunwayDirection
Runway Obstacle free zone	RunwayProtectArea[type =’OFZ’].width, RunwayProtectArea[type =’OFZ’].length, RunwayProtectArea[type =’OFZ’].lighting, RunwayProtectArea[type =’OFZ’].surfaceProperties, RunwayProtectArea[type =’OFZ’].protectedRunwayDirection
Arresting System	RunwayDirection.annotation[purpose =‘OTHER:ARRESTING-SYSTEM’].Note

2.9 FATO (Final Approach and Take Off)

The mapping will be for the following sections (ICAO Doc. 10066 PANS-AIM paragraph 5.2.1.1.3) respectively:

- ✓ AD 2.16 “Helicopter Landing Area” – new line (9);

AIXM 5.1/AIXM 5.1.1 Mapping details

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Designator	Runway.designator, Runway.associatedAirportHeliport, or RunwayDirection.designator, RunwayDirection.usedRunway

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Type	Runway[type='FATO']
Length	Runway.nominalLength, Runway.lengthAccuracy
Width	Runway.nominalWidth
Surface Characteristics	Runway.surfaceProperties.SurfaceCharacteristics.composition, Runway.surfaceProperties.SurfaceCharacteristics.classPCN, Runway.surfaceProperties.SurfaceCharacteristics.pavementTypePCN, Runway.surfaceProperties.SurfaceCharacteristics.pavementSubgradePCN, Runway.surfaceProperties.SurfaceCharacteristics.maxTyrePressurePCN, Runway.surfaceProperties.SurfaceCharacteristics.evaluationMethodPCN
True Bearing	RunwayDirection.trueBearing, RunwayDirection.trueBearingAccuracy
Magnetic Bearing	RunwayDirection.magneticBearing
Threshold point	RunwayCentrelinePoint[role = 'THR']
Threshold point - Position	RunwayCentrelinePoint[role='THR'].location.ElevatedPoint , RunwayCentrelinePoint[role='THR'].location.ElevatedPoint.horizontalAccuracy
Threshold point - Elevation	RunwayCentrelinePoint[role='THR'].location.ElevatedPoint.elevation, RunwayCentrelinePoint[role='THR'].location.ElevatedPoint.verticalAccuracy
Threshold point - Geoid undulation	RunwayCentrelinePoint[role='THR'].location.ElevatedPoint.geoidUndulation, RunwayCentrelinePoint[role='THR'].location.ElevatedPoint.verticalAccuracy
FATO Approach Light System	ApproachLightingSystem.intensityLevel, ApproachLightingSystem.type, ApproachLightingSystem.length, ApproachLightingSystem.servedRunwayDirection
Remarks	Runway.annotation

2.10 TLOF (Touchdown and Lift-Off Area)

The mapping will be for the following sections (ICAO Doc. 10066 PANS-AIM paragraph 5.2.1.1.3) respectively:

- ✓ AD 2.16 "Helicopter Landing Area" – new line (9);

AIXM 5.1/AIXM 5.1.1 Mapping details

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Designator	TouchDownLiftOff.designator

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Centre point - Position	TouchDownLiftOff.aimingPoint.ElevatedPoint, TouchDownLiftOff.aimingPoint.ElevatedPoint.horizontalAccuracy
Centre point - Elevation	TouchDownLiftOff.aimingPoint.ElevatedPoint.elevation, TouchDownLiftOff.aimingPoint.ElevatedPoint.verticalAccuracy
Centre point - Geoid undulation	TouchDownLiftOff.aimingPoint.ElevatedPoint.geoidUndulation, TouchDownLiftOff.aimingPoint.ElevatedPoint.horizontalAccuracy
Length	TouchDownLiftOff.length, TouchDownLiftOff.annotation[propertyName='length'].Note
Width	TouchDownLiftOff.width, TouchDownLiftOff.annotation[propertyName='width'].Note
Slope	TouchDownLiftOff.slope
Markings	TouchDownLiftOffMarking.markingICAOStandard, TouchDownLiftOffMarking.condition, TouchDownLiftOffMarking.element.MarkingElement.colour, TouchDownLiftOffMarking.element.MarkingElement.style, TouchDownLiftOffMarking.element.MarkingElement.extent_surfaceExtent.ElevatedSurface, TouchDownLiftOffMarking.markedTouchDownLiftOff
Surface type	TouchDownLiftOff.SurfaceCharacteristics.composition, TouchDownLiftOff.surfaceProperties.SurfaceCharacteristics.classPCN, TouchDownLiftOff.surfaceProperties.SurfaceCharacteristics.pavementTypePCN, TouchDownLiftOff.surfaceProperties.SurfaceCharacteristics.pavementSubgradePCN, TouchDownLiftOff.surfaceProperties.SurfaceCharacteristics.maxTyrePressurePCN, TouchDownLiftOff.surfaceProperties.SurfaceCharacteristics.evaluationMethodPCN
Remarks	TouchDownLiftOff.annotation

2.11 Radio Navigation Aid

The mapping will be for the following sections (ICAO Doc. 10066 PANS-AIM paragraph 5.2.1.1.3) respectively:

- ✓ GEN 2.5 “List of radio navigation aids” – line a;
- ✓ ENR 4.1 “Radio navigation aids— en-route” – line g;
- ✓ ENR 4.2 “Special navigation systems ” – line h;
- ✓ AD 2.19 “Radio navigation and landing aids” – line q;
- ✓ AD 3.18 “Radio navigation and landing aids. – line s;

AIXM 5.1/AIXM 5.1.1 Mapping details

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Type	Navaid.type
Identification	Navaid.designator and/or (VOR.designator Or DME.designator Or Glidepath.designator Or Localizer.designator Or NDB.designator Or MarkerBeacon.auralMorseCode)
Name	Navaid.name and/or VOR.name Or DME.name Or Glidepath.name Or Localizer.name Or NDB.name
Aerodrome served	Navaid.servedAirport

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Hours of operation	Navaid.NavaidOperationalStatus[operationalStatus='OPERATIONAL'].timeInterval and/or VOR.availability.NavaidOperationalStatus[operationalStatus='OPERATIONAL'].timeInterval Or DME.availability.NavaidOperationalStatus[operationalStatus='OPERATIONAL'].timeInterval Or Glidepath.availability.NavaidOperationalStatus[operationalStatus='OPERATIONAL'].timeInterval Or Localizer.availability.NavaidOperationalStatus[operationalStatus='OPERATIONAL'].timeInterval Or NDB.availability.NavaidOperationalStatus[operationalStatus='OPERATIONAL'].timeInterval
Magnetic variation - Angle	VOR.magneticVariation VOR.magneticVariationAccuracy Or DME.magneticVariation DME.magneticVariationAccuracy Or Glidepath.magneticVariation Glidepath.magneticVariationAccuracy Or Localizer.magneticVariation Localizer.magneticVariationAccuracy Or NDB.magneticVariation, NDB.magneticVariationAccuracy
Magnetic variation - Date	VOR.dateMagneticVariation Or DME.dateMagneticVariation Or Glidepath.dateMagneticVariation Or Localizer.dateMagneticVariation Or NDB.dateMagneticVariation

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Frequency	Localizer.frequency or Glidepath.frequency or VOR.frequency or MarkerBeacon.frequency or NDB.frequency or SDF.frequency Or DME.ghostFrequency
Channel	TACAN.channel or DME.channel or Azimuth.channel
Position	(Navaid.location.ElevatedPoint, Navaid.location.ElevatedPoint.horizontalAccuracy) and/or (VOR.location.ElevatedPoint, VOR.location.ElevatedPoint.horizontalAccuracy) Or (DME.location.ElevatedPoint, DME.location.ElevatedPoint.horizontalAccuracy) Or (Glidepath.location.ElevatedPoint, Glidepath.location.ElevatedPoint.horizontalAccuracy) Or (Localizer.location.ElevatedPoint, Localizer.location.ElevatedPoint.horizontalAccuracy) Or (NDB.location.ElevatedPoint, NDB.location.ElevatedPoint.horizontalAccuracy)

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Elevation	Navaid.location.ElevatedPoint.elevation, Navaid.location.ElevatedPoint.verticalAccuracy, Navaid.location.ElevatedPoint.verticalDatum, (DME.location.ElevatedPoint.elevation, DME.location.ElevatedPoint.verticalAccuracy, DME.location.ElevatedPoint.verticalDatum) Or (Glidepath.location.ElevatedPoint.elevation, Glidepath.location.ElevatedPoint.verticalAccuracy, Glidepath.location.ElevatedPoint.verticalDatum) Or (Localizer.location.ElevatedPoint.elevation, Localizer.location.ElevatedPoint.verticalAccuracy, Localizer.location.ElevatedPoint.verticalDatum) Or (NDB.location.ElevatedPoint.elevation, NDB.location.ElevatedPoint.verticalAccuracy, NDB.location.ElevatedPoint.verticalDatum) Or (VOR.location.ElevatedPoint.elevation, VOR.location.ElevatedPoint.verticalAccuracy, VOR.location.ElevatedPoint.verticalDatum)
Magnetic bearing /True bearing	Localizer.magneticBearing, Localizer.magneticBearingAccuracy, Localizer.trueBearing, Localizer.trueBearingAccuracy
Zero bearing direction	VOR.zeroBearingDirection
Purpose (A, E)	Navaid.purpose
Runway served	Navaid.runwayDirection
Type of supported Operations (e.g. ILS CAT)	Navaid.signalPerformance
Course Quality	Navaid.courseQuality
Integrity Level	Navaid.integrityLevel
Datum	Navaid.Datum
Collection	Navaid.NavaidComponent.collocationGroup
Station declination (angle) for ILS and VORDME;	Localizer.declination
Declination	VOR.declination

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Azimuth remarks	Azimuth.annotation
Angle i.e. GP angle	Glidepath.slope
RDH	Glidepath.rdh
DOC(designated operational coverage)	RadioFrequencyArea, RadioFrequencyArea.equipment_navaidEquipment, VOR.annotation Or DME.annotation Or Glidepath.annotation Or Localizer.annotation Or NDB.annotation
Operating authority	NavaidEquipment.authority.OrganisationAuthority.name or NavaidEquipment.annotation or Navaid.annotation
Remarks	Navaid.annotation, VOR.annotation Or DME.annotation Or Glidepath.annotation Or Localizer.annotation Or NDB.annotation

2.12 Aeronautical Ground Light

The mapping will be for the following section (ICAO Doc. 10066 PANS-AIM paragraph 5.2.1.1.3) respectively:

- ✓ ENR 4.5 “Aeronautical Ground Lights — En-route” – *line j;*

AIXM 5.1/AIXM 5.1.1 Mapping details

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Type	AeronauticalGroundLight.type
Name	AeronauticalGroundLight.name
Intensity	AeronauticalGroundLight.annotation.Note
Characteristics	AeronauticalGroundLight.colour, AeronauticalGroundLight.flashing, AeronauticalGroundLight.annotation.Note
Hours of operations	AeronauticalGroundLight.annotation.Note
Position	AeronauticalGroundLight.location.ElevatedPoint

2.13 En-Route Holding

The mapping will be for the following section (ICAO Doc. 10066 PANS-AIM paragraph 5.2.1.1.3) respectively:

- ✓ ENR 3.6 “En - Route Holding” – *line f;*

AIXM 5.1/AIXM 5.1.1 Mapping details

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Identification	N/A
Type	HoldingPattern[type=’ENR’].type
Fix	HoldingPattern.holdingPoint.EnRouteSegmentPoint.pointChoice_fixDesignatedPoint Or HoldingPattern.holdingPoint.EnRouteSegmentPoint.pointChoice_navaidSystem
Waypoint	HoldingPattern.holdingPoint.EnRouteSegmentPoint.pointChoice_fixDesignatedPoint Or HoldingPattern.holdingPoint.EnRouteSegmentPoint.pointChoice_navaidSystem
Inbound track	HoldingPattern.inboundCourse
Turn Direction	HoldingPattern.turnDirection
Speed	HoldingPattern.speedLimit
Level - Minimum holding level	HoldingPattern.lowerLimit, HoldingPattern.lowerLimitReference
Level - Maximum holding level	HoldingPattern.upperLimit, HoldingPattern.upperLimitReference
Time/distance outbound	HoldingPattern.outboundLegSpan_endTime.HoldingPatternDuration.duration Or HoldingPattern.outboundLegSpan_endDistance.HoldingPatternDistance.length
Special holding entry procedure	HoldingPattern.instruction

PANS-AIM	AIXM 5.1/AIXM 5.1.1
Controlling Unit	AirTrafficControlService.Name, AirTrafficControlService.call-sign, AirTrafficControlService.radioCommunication, AirTrafficControlService.clientHolding, RadioCommunicationChannel.frequencyTransmission

3 Metadata to be included in AIP Data set File

3.1 Scope

Metadata shall be collected for aeronautical data processes and exchange points throughout the aeronautical information data chain, from origination to distribution to the next intended user.

Each quality management system shall include the necessary policies, processes and procedures, including those for the use of metadata, to ensure and verify that aeronautical data are traceable throughout the aeronautical data chain in order to allow any data anomalies or errors detected to be identified by root cause, corrected and communicated to affected users.

3.2 Metadata requirements

Generally, AIS has the responsibility to verify the collected data from the surveyor/originator. Moreover, AIS has the obligation to provide data sets to the next intended user.
Metadata is essential in the understanding, processing and delivery of information by using an information service. Metadata should enable information service consumers to evaluate the originating source of information, the quality of service and information before consuming the information service.

Information service providers should specify the origins and/or sources of the data and they should also provide information on any subsequent modifications applied in the *Source of Information* metadata field of the information Service Overview.

If an information service provider does not make the source of information available, the *Source of Information* metadata field shall specify “NIL”.

Information service providers shall provide a description of the geographic coverage of the data and information exchanged in the information service payload in the *Geographical Extent of Information* metadata field of the information Service Overview to allow information service consumers understand the geographical coverage of the information being provided.

The geographic coverage should be expressed in terms of ICAO region, FIR, Aerodrome, polygon, etc. More granular information such as coverage at Airport X, FIR Y should be provided as it may facilitate search responses when provided.

The *Figure* below is summarizing the ICAO Annex 15 requirements regarding the metadata thru the data chain in general, but the specific metadata requirements are shown in the “ICAO Data Set” section of the Figure. These should be supplemented by the need to use the ISO 19100 series as the reference framework, the need for data protection and the need to include specific requirements for geographical information metadata (ref. ISO Standards 19115).

The metadata to be collected shall include, as a minimum (ICAO Doc. 10066 PANS-AIM):

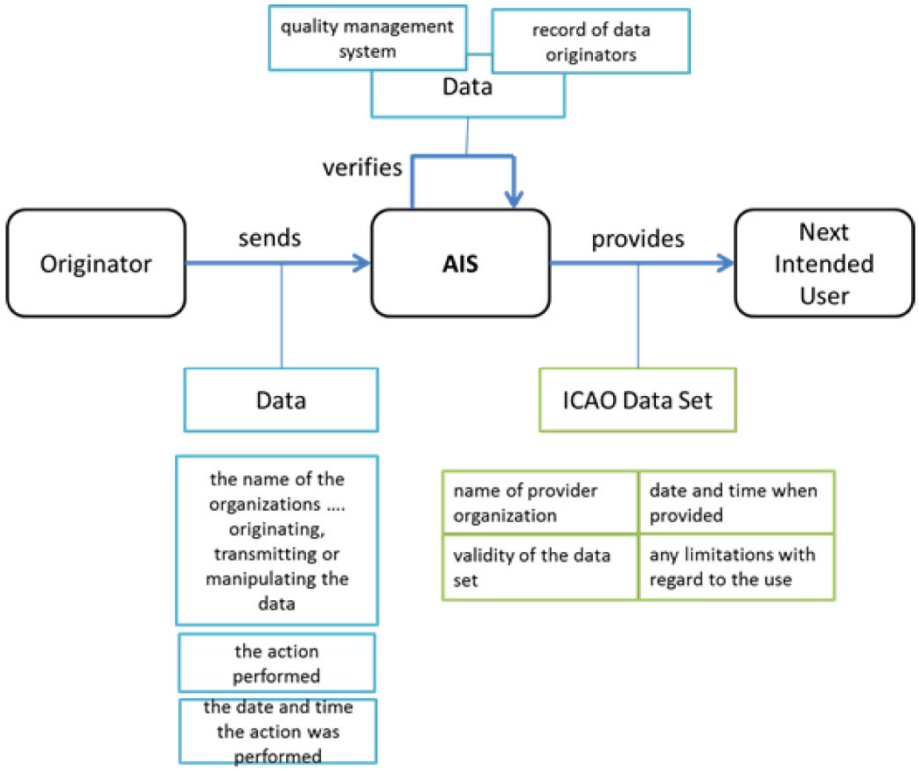
a) The names of the organizations or entities providing the data set;

b) The date and time when the data set was provided;
c) Period of validity of the data set (not required, validity of each feature lifetime will be present with each feature);
d) Any limitations with regard to the use of the data set;

Additionally, metadata included in AIP Data sets are:

i. AIP Amendment Number
ii. Publication Date
iii. Effective Date

For Example: AIP AMDT No: AIRAC AMDT 12/2025, Publication date: 2025-10-16T00:00:00.000Z, Effective date: 2025-11-27T00:00:00.000Z



Below is a sample Metadata code and value list highlighted in “yellow” that is included in AIP Data set.

Important Note: Metadata will be present at Message Level.

```
<aixm:messageMetadata xmlns:xs="http://www.w3.org/2001/XMLSchema"
                      xmlns:gmd="http://www.isotc211.org/2005/gmd"
                      xmlns:gco="http://www.isotc211.org/2005/gco"
                      xmlns:aixm="http://www.aixm.aero/schema/5.1">
    <gmd:MD_Metadata>
      <gmd:characterSet>
        <gmd:MD_CharacterSetCode
codeList="http://www.aixm.aero/schema/5.1/ISO_19139_Schemas/resources/Codelist/gmxCodelists.xml#MD_CharacterSetCode"
                                 codeListValue="utf8">utf8</gmd:MD_CharacterSetCode>
      </gmd:characterSet>
      <gmd:contact/>
      <gmd:dateStamp>
```

<gco:DateTime>2025-10-17T06:30:02.759Z</gco:DateTime>
</gmd:dateStamp>
<gmd:identificationInfo>
<gmd:MD_DataIdentification>
<gmd:citation>
<gmd:CI_Citation>
<gmd:title>
<gco:CharacterString>Publisher identifier</gco:CharacterString>
</gmd:title>
<gmd:date>
<gmd:CI_Date>
<gmd:date>
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</gmd:date>
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<gmd:CI_DateTypeCode
codeList="http://www.aixm.aero/schema/5.1/ISO_19139_Schemas/resources/Codelist/gmxCodelists.xml#CI_DateTypeCode"
codeListValue="creation">creation</gmd:CI_DateTypeCode>
</gmd:dateType>
</gmd:CI_Date>
</gmd:date>
<gmd:date>
<gmd:CI_Date>
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</gmd:date>
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<gmd:CI_DateTypeCode
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codeListValue="publication">publication</gmd:CI_DateTypeCode>
</gmd:dateType>
</gmd:CI_Date>
</gmd:date>
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</gmd:citation>
<gmd:abstract>
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</gmd:organisationName>
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<gmd:CI_Contact>
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<gmd:CI_Telephone>
<gmd:voice>
<gco:CharacterString>00971 2 599 6895</gco:CharacterString>
</gmd:voice>
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</gmd:facsimile>

```
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                    <gmd:CI_Address>
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                        <gco:CharacterString>Abu Dhabi</gco:CharacterString>
                      </gmd:city>
                      <gmd:postalCode>
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                      </gmd:postalCode>
                      <gmd:country>
                        <gco:CharacterString>United Arab Emirates</gco:CharacterString>
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                        <gco:CharacterString>aim@szc.gcaa.ae</gco:CharacterString>
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                  </gmd:address>
                </gmd:CI_Contact>
              </gmd:contactInfo>
              <gmd:role>
                <gmd:CI_RoleCode
codeList="http://www.aixm.aero/schema/5.1/ISO_19139_Schemas/resources/Codelist/gmxCodelist
s.xml#CI_RoleCode"
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              </gmd:role>
            </gmd:CI_ResponsibleParty>
          </gmd:pointOfContact>
          <gmd:language>
            <gco:CharacterString>eng</gco:CharacterString>
          </gmd:language>
        </gmd:MD_DataIdentification>
      </gmd:identificationInfo>
    </gmd:MD_Metadata>
  </aixm:messageMetadata>
```

- END -