FIXM Release Plan

The **F**light **I**nformation **E**xchange **M**odel (FIXM) is an exchange model capturing Flight and Flow information that is globally standardised. The requirement for FIXM was identified by the International Civil Aviation Organisation (ICAO) Air Traffic Management Requirements and Performance Panel (ATMRPP) and endorsed at the 12th Air Navigation Conference as part of the Aviation System Block Upgrades (ASBU) and as described in Flight and Flow Information for a Collaborative Environment (FF-ICE).

The FIXM Release Plan describes the FIXM CCB roadmap for the FIXM core releases and for the verified extensions to FIXM.

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Document history

Version	Author	Description of Changes	Status
1.0	FIXM CCB	First official version. Appendix A captures the FIXM versioning policy previously described in the FIXM Change Management Charter.	Approved by ICAO ATMRPP during ATMRPP/2 (Nov 2016). Endorsed by the FIXM CCB on 07-Feb-2017.
1.1	FIXM CCB	Integration of the common –XM versioning policy agreed with AIXM Requalification of the MAJOR FIXM 5.0.0 release to MINOR FIXM 4.2.0 release. Improved description of the dependencies on ICAO's schedule for FF-ICE	Endorsed by the FIXM CCB on 26-Apr-2018

Introduction

The FIXM Release Plan describes the roadmap for the FIXM core releases and for the verified extensions to FIXM. It provides information about the overall ICAO Information Management & SWIM contexts that drive the FIXM development, identifies the planned release dates for FIXM core versions and verified extensions, and outlines the general and specific aims of each version.

This document is developed and managed by the FIXM Change Control Board under the supervision of the ICAO ATMRPP, as stated in the FIXM Strategy [1] and FIXM Change Management Charter [2].

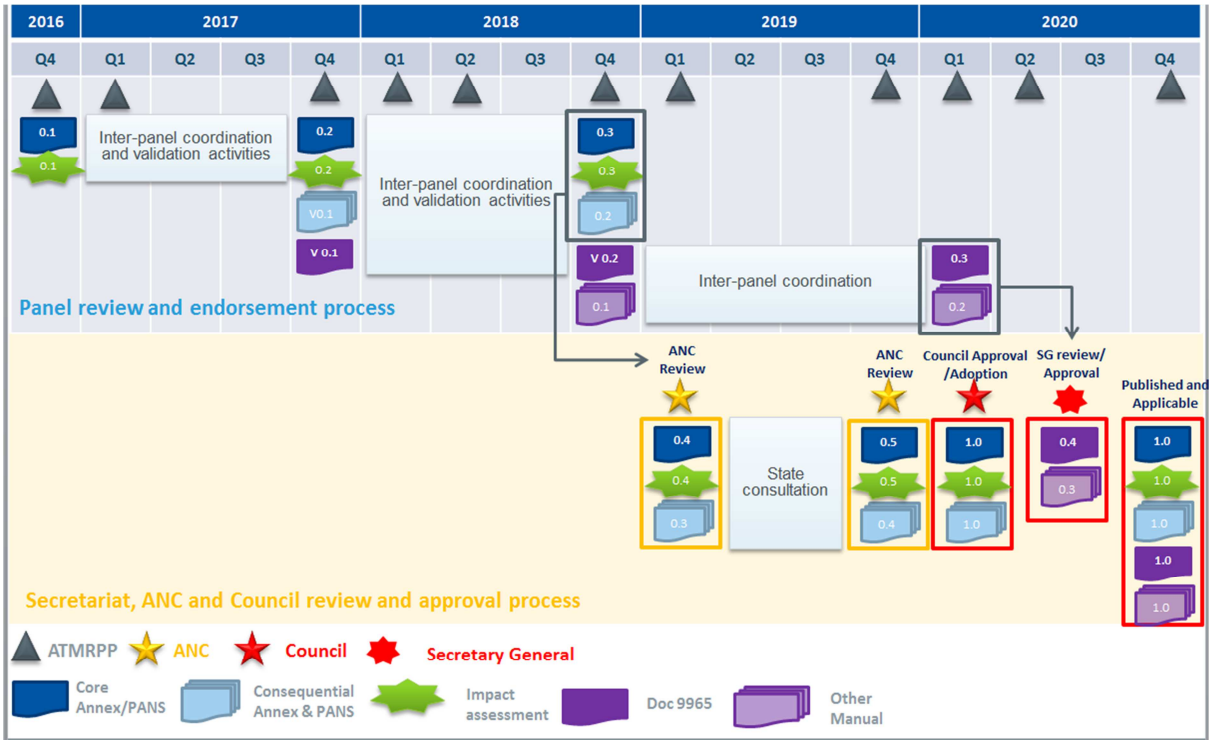
ICAO Roadmap for SWIM and Flight & Flow information exchanges

FIXM is developed as an enabler for the ICAO FF-ICE concept [3]. Therefore, the FIXM release plan shall be aligned with the FF-ICE schedule defined by ICAO.

The FIXM Strategy [1] also recognises that FIXM should eventually align with the ICAO AIRM, which is developed by ICAO in support of the implementation of SWIM. Therefore, the roadmap for SWIM defined by ICAO should be also taken into consideration by the FIXM CCB when planning new FIXM releases.

FF-ICE/PLANNING related milestones

ICAO Doc 9965 is the main driver for FIXM. The FIXM Release plan has therefore a direct dependency on ICAO's update schedule for ICAO Doc 9965. The following picture has been developed by ICAO ATMRPP and highlights the ICAO Panels review and endorsement process for the FF-ICE/PLANNING "package", including the proposed revisions to the ICAO Annexes and PANS and the proposed revisions to ICAO Doc 9965.



The following facts related to FF-ICE/PLANNING are noted from this picture:

- The FF-ICE/PLANNING applicability date is Q4 2020.

> *Note: There is no ICAO mandate for FF-ICE/PLANNING. In this context, applicability is understood as follows: "the published standard is applicable only to the organizations willing to implement FF-ICE/ PLANNING". National or regional regulations may however enforce FF-ICE/ PLANNING implementation by a certain date.*

- The proposed updates to ICAO Doc 9965 (identified in purple on the picture above) will be subject to ICAO inter-panel coordination in 2019 and to a review & approval by the Secretary General in Q3 2020. Intermediary versions of the revised ICAO Doc 9965 will be distributed in support of the various steps of the review and endorsement process:
    - V 0.2, planned for Q4 2018, will be the version proposed for inter-panel coordination that will take place in 2019.
    - V 0.3, planned for Q1 2020, will incorporate the feedback from the inter-panel coordination. It will be the version proposed for review and approval by the Secretary General.
    - V 0.4, planned for Q3 2020, will incorporate the feedback from the SG review. It will be the version proposed for formal publication.
    - V 1.0, planned for Q4 2020, will be the new version officially published.

From a FIXM point of view, a mature and stable FIXM version that is "FF-ICE/PLANNING ready" needs to be made available as soon as possible in support of the implementation of FF-ICE from the FF-ICE/PLANNING applicability date onwards. FF-ICE/PLANNING readiness will be gradually demonstrated through appropriate FIXM V&V activities, using the intermediary versions and official revision of ICAO Doc 9965.

FF-ICE/EXECUTION considerations

This version of the FIXM Release Plan focuses only the evolution of FIXM in support of FF-ICE/PLANNING.

Future versions of this document will outline the foreseen evolution of FIXM in order to enable early support for FF-ICE/EXECUTION concepts while preserving the stability of the FIXM solution for FF-ICE/PLANNING.

Other ICAO Panels which can influence FIXM

FIXM is developed under the supervision of the ICAO ATMRPP, which defines the main requirements for FIXM. Alignment of FIXM with the work to be produced by the ICAO Information Management Panel will also be realised over time, as stated in the FIXM Strategy [1].

Additional ICAO panels or groups may also influence the evolution of FIXM, including, but not limited to:

- The ICAO Dangerous Goods Panel
- The ICAO Performance Based Navigation Sub-Group
- The ICAO ATM Ops Panel

While the coordination between these groups will take place at ICAO level, the FIXM CCB may capture particular inputs or requirements from these panels in the FIXM release plan, as needed.

Release Plan for FIXM Core

This section contains the FIXM core release plan as foreseen by the FIXM CCB as of April 2018. Information about the next FIXM release strives to be as complete and accurate as possible in terms of general and specific aims, scope, and planned deliveries of alpha, beta and release candidate versions (see also APPENDIX B - General considerations about FIXM releases).

Information about FIXM core versions foreseen in the longer term, if available, is provided based on the best FIXM CCB knowledge of the FF-ICE and FIXM contexts as of the publication date of the document, and is therefore subject to change. In this context, a FIXM core version may be added to the table as a "provisional" release in order to acknowledge:

- The likely need of a new FIXM release in order to satisfy new ICAO inputs, based on the ICAO FF-ICE and SWIM Implementation schedules.
- That further bug-fixes or ad-hoc optimisations may be required over time by the FIXM community of interest.

"Provisional" releases cannot be scheduled firmly by the FIXM CCB. Information about the release date of a provisional release is therefore subject to change.

FIXM Core Release	Due Date	Summary of General and Specific Aims
FIXM v4.2.0 **(confirmed)** *See also Note 1*	**30-June-2019**	**General aim:** - Align with the requirements for FF-ICE/PLANNING based on the Q4 2018 Intermediary version of ICAO Doc 9965; - Optimise FIXM Core design based on implementers' feedback.
		Specific aim: - Revisit the "Messaging" package in the light of ATMRPP's desired technical vision for FF-ICE/PLANNING – *see also Note 2* - Clarify the absent data policy for FIXM in line with FF-ICE/PLANNING update strategy.
		Scope statement: FIXM 4.2.0 shall support: - The content of the individual ATS message fields described in ICAO Doc 4444 – *see also Note 3* - The flight data items identified by ICAO ATMRPP as part of the requirements for FF-ICE/PLANNING. – *see also Note 2*

Note 1: The new version of FIXM planned for June 2019 used to be labelled 5.0.0 in the previous version of the FIXM Release Plan. Following the consolidation of the version policy for FIXM (see APPENDIX A - FIXM versioning policy) and anticipating that the evolution of the information exchange requirements for FF-ICE/PLANNING will not require major conceptual changes to FIXM, the FIXM CCB decided to requalify the June 2019 version of FIXM to a MINOR release and consequently to rename it to 4.2.0.

Note 2: As of April 2018, discussions are underway at ICAO level for further clarifying, among others, the potential need for technical harmonization of some aspects of the FF-ICE/PLANNING services, and in particular the messaging aspects. These ICAO discussions may eventually affect the scope statement for FIXM. At a minimum, FIXM 4.2.0 will support the flight data items identified by ICAO ATMRPP.

Note 3: FIXM 4.1.0 development showed that an extension may prove a better technical solution for supporting specific data elements conveying 'historical' information. This part of the scope statement is therefore to be understood in a broad sense: the 'FIXM 4.2.0 package', which may include a complementary verified extension, will provide support for the ATS message content.

Release Plan for FIXM verified extensions

Verified extensions are extensions to FIXM core whose development is managed by the FIXM CCB. The content of a verified extension may be promoted to FIXM core over time as appropriate, if approved by the FIXM governance.

This section describes the release plans of the verified extensions developed by the FIXM CCB.

Verified extension for specific ATS message elements

A verified extension to FIXM 4.1.0 supporting ICAO CHG Message content was released as a result of FIXM Change Request 8. A new MINOR version of this extension compatible with FIXM 4.2.0 is planned for June 30, 2019.

AIDC extension

Extension Release	Based on FIXM Core version	Due Date	Summary of General and Specific Aims
1.0.0 (provisional)	TBD	TBD	**General aim:** - Accommodate the AIDC message content, using the PAN AIDC ICD published by ICAO (APANPIRG and NAT SPG).
			Specific aim: - Serve as a testbed for the development of a verified extension. - Support further technical discussions about the integration of extensions' content into messages & service payloads, and check whether initial guidance can be provided.
			Scope statement: The AIDC extension v1.0.0 to FIXM v4.0.0 shall support: - All the flight data items not captured in FIXM core that are required for forming the AIDC message content.

References

[1] FIXM Strategy v1.1

[2] FIXM Change Management Charter v1.2

[3] Manual on Flight and Flow Information for a Collaborative Environment (First Edition – 2012), ICAO Doc 9965

APPENDIX A - FIXM versioning policy

Note: the versioning policy described below corresponds to the policy discussed and consolidated with the AIXM community over 2017 using the cross-XM coordination workspace and equally promoted to the AIXM documentation per AIXM Jira Issue 278.

The applicable versioning policy for –XMs uses 'Semantic versioning 2.0.0' as a common reference: **MAJOR.MINOR.PATCH**.

A **MAJOR** (**X**.y.z) version introduces major conceptual changes. Forward data mapping is not guaranteed. The changes justifying a new MAJOR release include, but are not limited to:

- Re-factoring a large part of the model
- Scope reduction of the –XM / deletion of model elements without prior deprecation or replacement
- Use of a different data encoding syntax, or withdrawal of a given physical realization of the –XM Logical Model

A **MINOR** (x.**Y**.z) version introduces new model elements and capabilities guaranteeing forward data mapping for non-deprecated elements or deprecated elements with replacement. Loss of information may happen for elements being no longer required. The changes allowed in a MINOR release include, but are not limited to:

- Inclusion of new model elements, in particular in support of evolving ICAO requirements (e.g. SARPS update)
- Deprecation of model elements, with or without replacement
- Deletion of model elements deprecated in a previous version
- Addition of a new physical realization of the –XM Logical Model

A **PATCH** (x.y.**Z**) version is limited to bug fixing. Forward and backward data mapping is guaranteed without loss of information. A PATCH version does not impose changes in a consuming system. A PATCH version may still require data conversion to be made ahead of the data entering in the consuming system (done by a mediator service). The changes allowed in a PATCH release include, but are not limited to:

- Clarification of definitions, changes to the –XM documentation package and/or to the -XM Logical Model with no impact on the physical realization(s).
- Correcting spelling mistakes, incl. in physical realisations
- Updating external references

Alpha, Beta or Release Candidate versions, if created, will be named as follows:

- X.Y.Z**_ALPHA**
- X.Y.Z**_BETA**
- X.Y.Z**_RC**

An optional increment may be added in order to distinguish between multiple ALPHA, BETA or RC versions (e.g. X.Y.Z_RC**2**)

NOTES & CLARIFICATIONS

- For the -XMs, the notion of backward/forward compatibility is to be understood from a data mapping point of view. Two consecutive versions are considered backward (resp. forward) compatible if backward (resp. forward) data mapping is enabled.

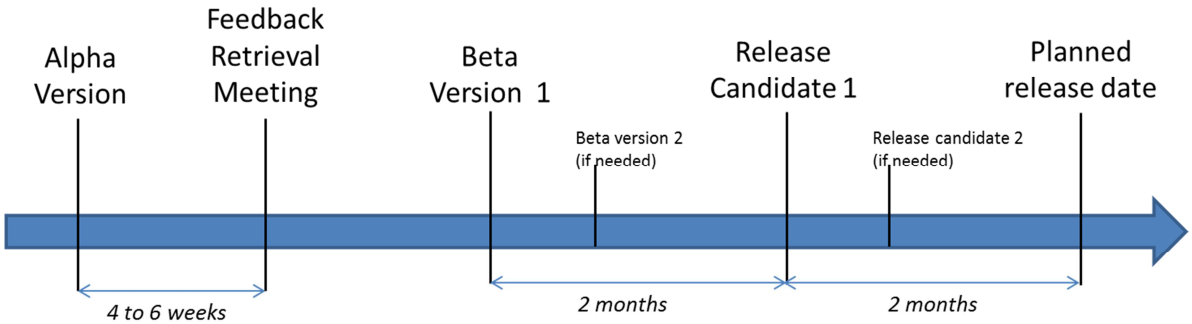
APPENDIX B - General considerations about FIXM releases

As part of the lessons learned during the FIXM v4.0 development, the FIXM CCB acknowledged that FIXM would benefit from a more rigorous and timely distribution of "beta versions" and "release candidates" enabling the FIXM Community of Interest to check the quality of the Change Request implementation, to look for remaining bugs etc.

The FIXM CCB also confirmed the value of face-to-face FIXM workshops during which FIXM stakeholders are invited to review and challenge preview versions and/or share implementation feedback.

Starting from 4.0.0 onwards, the development of new FIXM versions will include the publication of alpha, beta and release candidate versions, as described below:

- Alpha version: an optional version of FIXM integrating a set of approved changes but not necessarily containing all of the content or design changes that are planned for the final version.
    - An alpha version would commonly be distributed prior to a FIXM workshop or in support of other testing activities (E.g. OGC testbeds…), as needed.
    - An alpha version supporting a FIXM workshop would be released at least 4 weeks prior to the meeting.
- Beta version: a version of FIXM being considered complete in terms of content, but not yet fully verified and tested and therefore likely to contain bugs.
    - A first beta version would commonly be distributed at the end of the FIXM Change Requests integration, for further verification and testing by the FIXM community.
    - As a good practice, the first beta version should be distributed not later than four months before the official planned released date of the FIXM.
    - Additional beta versions may be released over time as bugs are being corrected.
- Release candidate: *a beta version with potential to be a final product, which is ready to release unless significant bugs emerge*.[1]
    - As a good practice, the first release candidate should be published no later than two months before the planned official release date of the corresponding FIXM version.



The release date for a new FIXM major or intermediate release should be established so that the delivery of alpha versions, beta versions and release candidates can be accommodated. A minor FIXM version, which is restricted to bug fixes, is unlikely to require the release of alpha and beta versions.

[1] Wikipedia definition

APPENDIX C – History of FIXM Core versions

Release	Released on	Content
1.0.0	Aug 2012	First core version including: - ICAO FP 2012 - GUFI
1.1.0	Dec 2012	Adds: - Hazardous Cargo (Dangerous Goods)
2.0.0	Aug 2013	Adds: - ICAO 2012 ATS (15 remaining messages) - TFM (Strategic) - Fleet prioritization, TFM DE, CDM - Airport CDM - ANSP to ANSP boundary crossing (tactical)
3.0.0	Aug 2014	Adds: - Surface data (anything not covered in Airport CDM and TFM/CDM elements) - 4D Trajectories (1st package)
3.0.1	Feb 2015	Qualifies the XSD schemas, by enabling the attribute elementFormDefault = "qualified" for every schema file. The change is limited to the XSD schemas, all supporting documentation remains the same as FIXM 3.0.0.
4.0.0	Aug 2016	This version supports: - The content of the individual ATS message fields described in ICAO Doc 4444 - The new flight data items identified by ICAO ATMRPP as part of the requirements for FF-ICE/PLANNING (based on working paper ref. ATMRPP-WG/31-WP/713 “Manual on FF-ICE Implementation Guidance”). Compared with the previous version, this release: - Retains only the pieces of flight information that are traceable to ICAO requirements (Doc 4444 and draft FF-ICE/PLANNING requirements). This implies that **some capabilities previously enabled by FIXM v3.0.1 are no longer supported**. - Incorporates a new messaging package for enabling the creation of the FF-ICE/PLANNING messages as described by ICAO ATMRPP. - Implements improved route and 4DT structures in line with FF-ICE/PLANNING requirements. - Achieves greater alignment with ISO standards (e.g. ISO 19103) and AIXM 5.1.
4.1.0	Dec 2018	This version: - Further captures the evolving requirements for FF-ICE/PLANNING; - Completes the rationalisation of the FIXM Core content based on ICAO ATMRPP inputs (rationalisation of the dangerous goods package); - Integrates optimisations based on implementers’ feedback.