



Network Manager
nominated by
the European Commission



B1 FF-ICE

Kim Breivik
FPFDE Project Manager
Network Strategy & Developments

Content

- Strategic perspective
- FF-ICE
- State of play



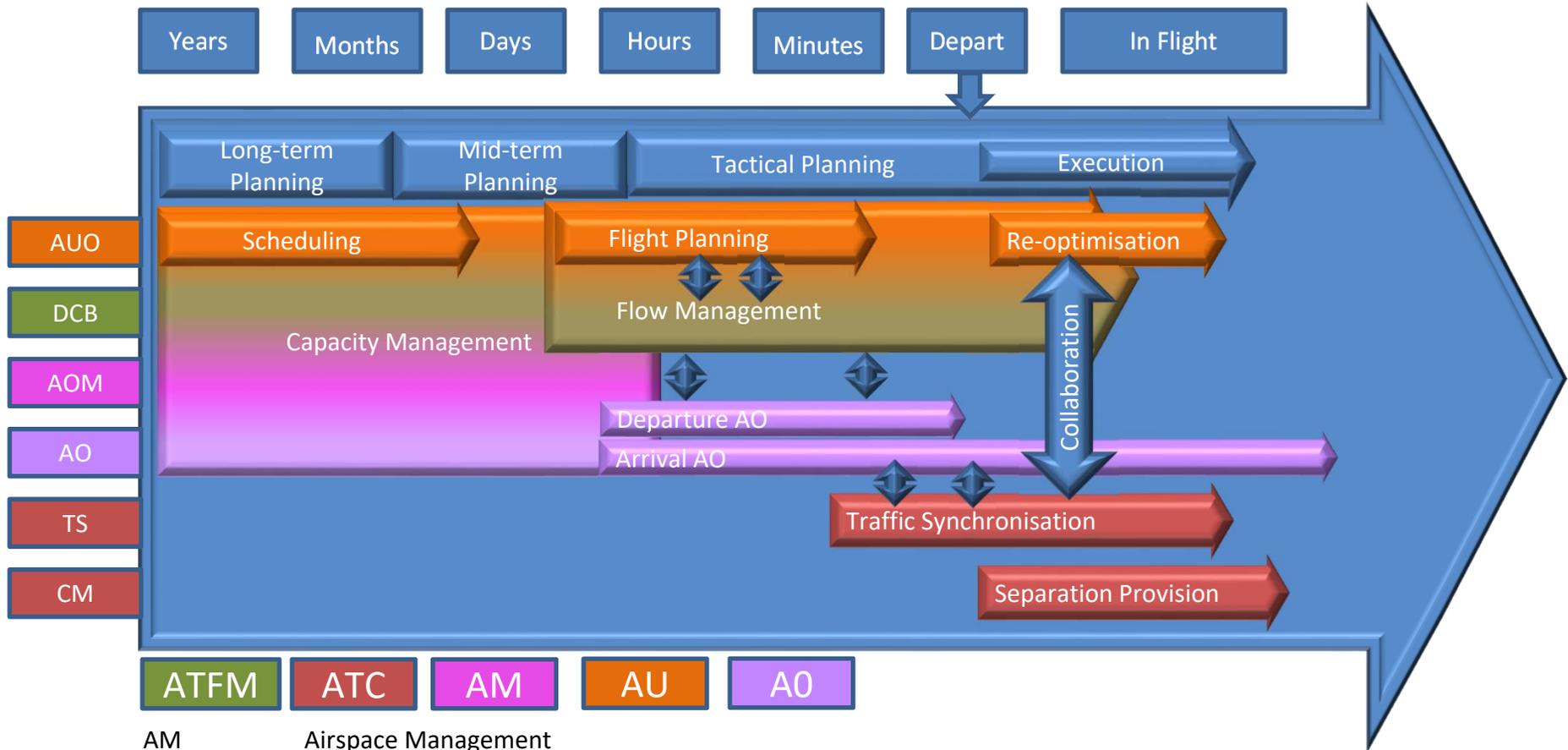
Drivers For Change

- ICAO GLOBAL ATM OPERATIONAL CONCEPT (Doc 9854)
Envisages an integrated and collaborative ATM system which employs the benefits of Trajectory Based Operations and CDM, enabled in a SWIM environment
- ICAO AVIATION SYSTEM BLOCK UPGRADE (ASBU) PROGRAMME
A planning framework for global harmonisation & interoperability
- SESAR ATM MASTERPLAN & Pilot Common Project
Requirement to exchange 4DT from 2022

TBO Building Blocks

- FF-ICE
- SWIM
- ADS-C EPP
- Sharing & coordination processes with all parties involved (airlines, CFSP, ANSP, aircraft, etc.)

Trajectory Based Operations



ATFM ATC AM AU AO

AM Airspace Management
 ATFM Air Traffic Flow Management
 AU Airspace User
 ATC Air Traffic Control
 AO Aerodrome Operator

Current Limitations

- Limited collaborative planning amongst ATM, aerodrome operators & aircraft operators
- Less than optimum use of scarce resources such as airspace
- Limited facilities for real time information exchange amongst ATM actors resulting in less than optimal response to real time events & changes in operational requirements
- Limited ability to maximise the benefits of advanced avionics

Resulting In:

INEFFICIENT AIRCRAFT OPERATIONS



Aims

- Ensure that definitions of flight & flow information are machine readable and globally standardised
- Incorporate information for increased CDM from the planning phase until the end of the operation
- Facilitate 4-D Trajectory Based Operations
- Allow operators to detail their performance capabilities
- Allow for an early indication of flight intent
- Avoid unnecessary limitations on information availability
- Allow for the provision of security requirements
- Consider the cost impact on providers and consumers of flight & flow information

Benefits To Be Delivered

- Capacity - Reduced controller workload and increased data fidelity supporting improved capacity
- Efficiency – better knowledge of aircraft capabilities, operator preferences & ATM constraints facilitates efficiency improvements
- Flexibility – greater accuracy facilitates flexibility, quicker adaptation of route changes
- Global Interoperability – A new mechanism for FPL filing and information sharing will facilitate flight data sharing amongst all actors
- FF-ICE/1 will facilitate CDM, the implementation of systems interconnection for information sharing & trajectory negotiation before departure thus improving capacity & efficiency
- Safety – more accurate flight information & dynamic management of TBO

- FF-ICE

FF-ICE



- Three phases
 - FF-ICE/1 – pre-departure enables the sharing and negotiation* of the planned trajectory between AU and ATM
 - Negotiation = systematic exchange of feedback
 - FF-ICE/2 – extend capability into post-departure phase
 - FF-ICE/3 – aircraft in the loop – TBO clearances



FF-ICE/1

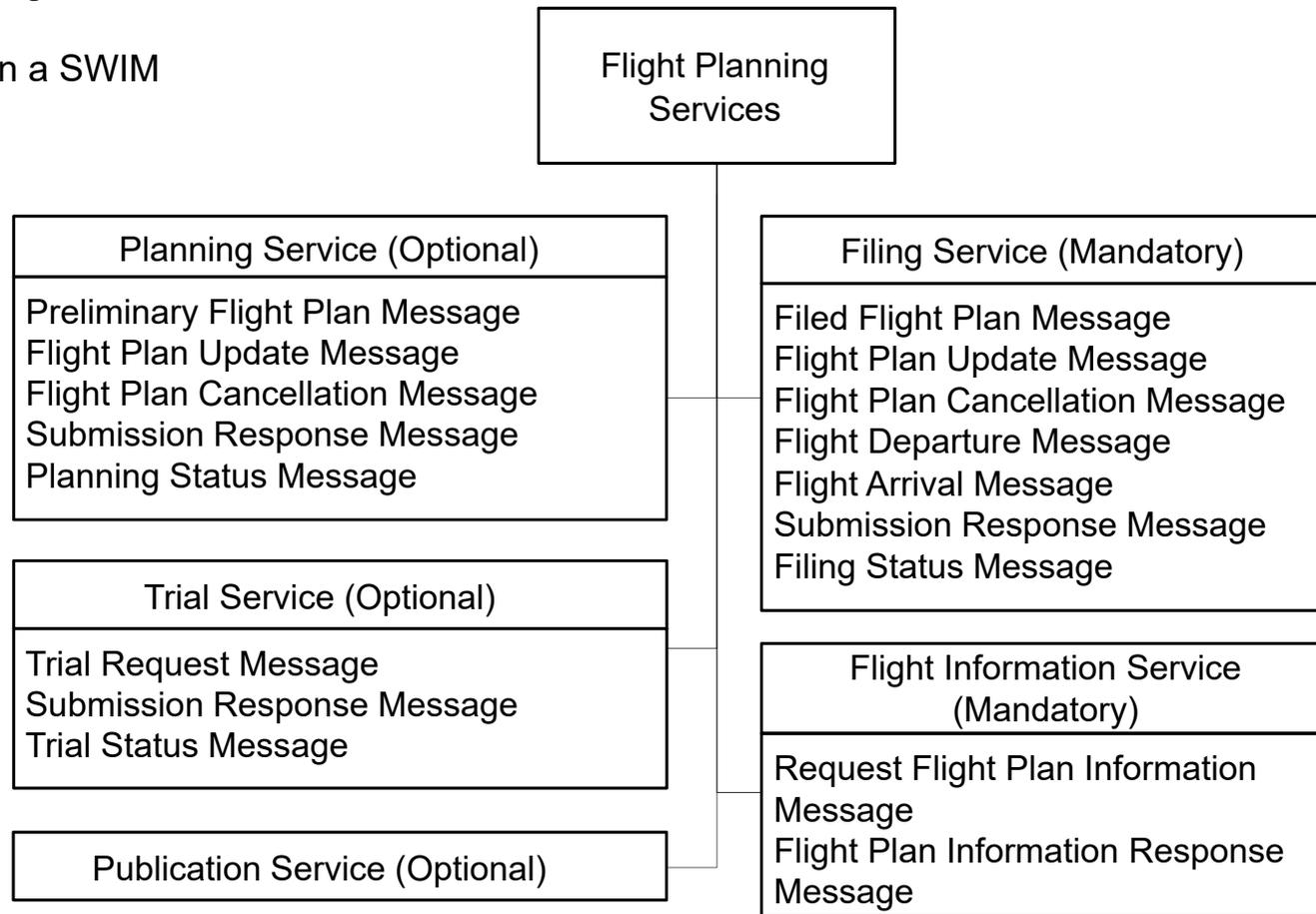
- FF-ICE includes:
 - ICAO Provisions : ATMRPP
 - Flight Information eXchange Model (FIXM) : Industry partnership
 - Applicability Date 2020
- Scope FF-ICE/1 (information):
 - FPL 2012
 - ASBU Block 1 flight information needs → pre-departure
 - GUFID (Global Unique Flight Identifier)
 - Submission and Maintenance process
 - 4D Trajectory elements inc. flight performance
 - Fleet prioritisation, Airport Slot, Dangerous Goods
 - Capabilities e.g. A-RNP
 - “Planning” phase – route/4DT negotiation

IATA HQ
Active involvement

FF-ICE Flight Planning Services



An exchange of flight planning related information within a SWIM environment



FF-ICE/1 Content - Submission / Distribution procedures

- State responsible for Dept. to publish applicable procedure(s):
 - AU to submit via ASP
 - or
 - **AU to submit directly to concerned parties (ANSPs, etc.)**

- If State responsible for Dept. fails to publish a procedure for FF-ICE submission:
 - AU may submit directly to concerned parties (ANSPs, Airports, etc.
 - or
 - AU may submit via an eASP having published its willingness to perform the tasks for the flight concerned

- If none of the above apply, the AU shall submit an FPL in accordance with current provisions

FF-ICE/1 Content - Filing Service - Filed Flight Plan (eFPL)

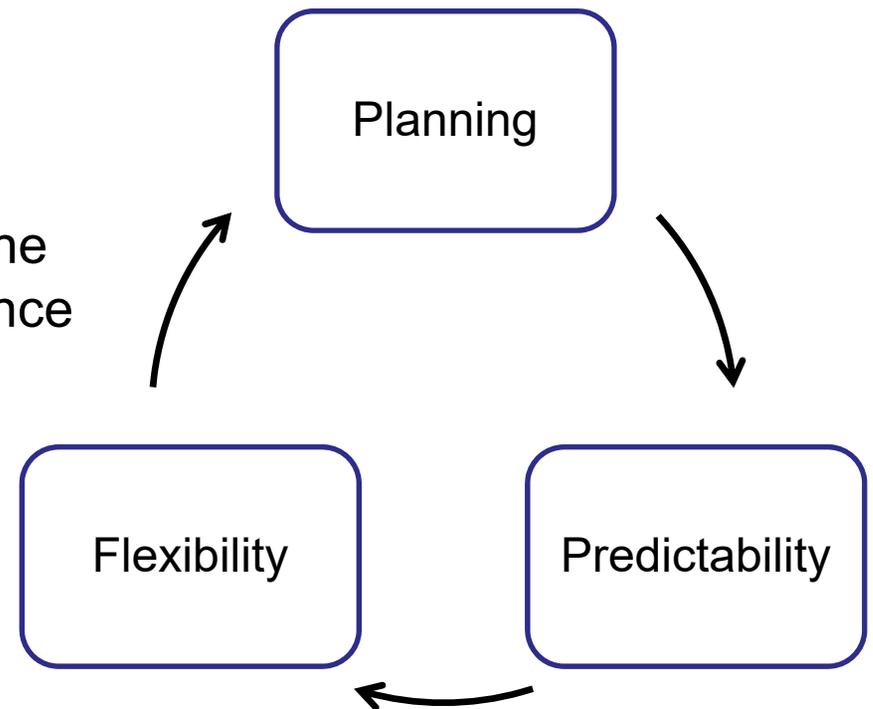
- Analogous process to today
- Contains all required information
- Information used for provision of ATS services
- Distribution to all concerned in appropriate format & via appropriate network(s)
- Feedback
 - Submission Response (ACK, MAN, REJ)
 - Synchronous response
 - Error indication as appropriate
 - Filing Status
 - May be asynchronous
 - Route / 4DT feedback (Acceptable, Not Acceptable)
 - Error indication as appropriate

FF-ICE/1 Content - Planning Service ('Preliminary Flight Plan')

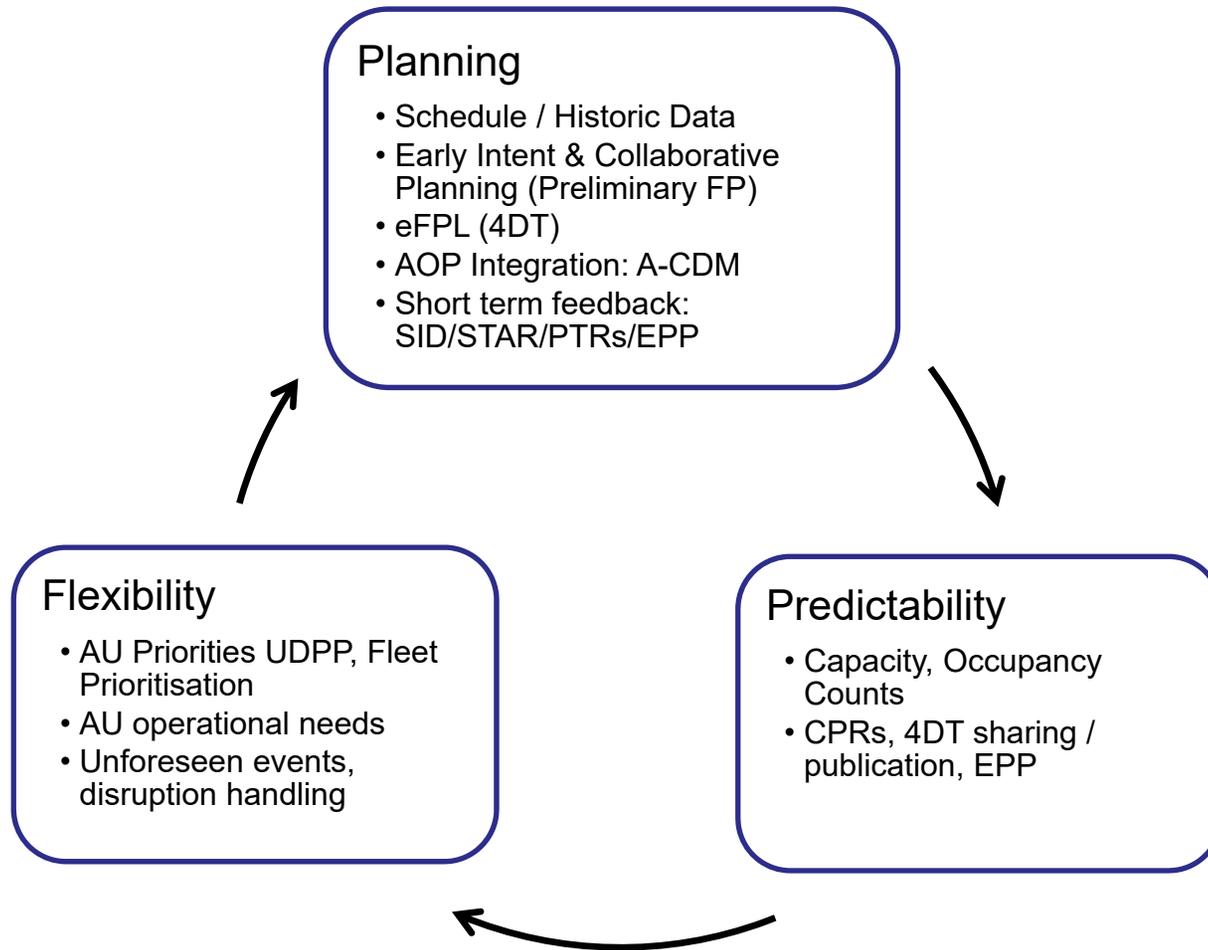
- An optional service – recommended to be provided by eASPs with many constraints and/or providing an ATFM service
- May contain limited information – intent to fly
- 'Preliminary Flight Plan' used for planning purposes only
- Performed only with eASP, as determined/required by AU
- Feedback
 - Submission Response (ACK, MAN, REJ) - almost never rejected
 - Synchronous response
 - Error indication as appropriate - error plus cause (reference to constraint)
 - Planning Status
 - May be asynchronous
 - Route / 4DT feedback (Concur, Negotiate, Non-Concur)
 - Error indication as appropriate - error plus cause (reference to constraint)
 - Route / 4DT proposal (optional)

Improvement Cycle

- Plan – “An organised (and usually detailed) proposal according to which something is to be done”
 - ❖ Requires collaboration
- Predictability is achieved through the creation, maintenance and adherence to a plan
 - ❖ Requires collaboration
- Flexibility – “capacity for ready adaptation to various purposes or conditions”
 - ❖ Requires collaboration



Improvement Cycle [2]



FF-ICE/1 Content - Trial Service ('Trial Request')

- An optional service – recommended to be provided by eASPs with many constraints and/or providing an ATFM service
- Can only be used when a Preliminary or Filed flight plan already exists
- Not retained or used by ATM
- Feedback
 - Submission Response (ACK, MAN, REJ)
 - Synchronous response
 - Error indication as appropriate - error plus cause (reference to constraint)
 - (Trial) Planning Status
 - May be asynchronous
 - Route / 4DT feedback (Concur, Negotiate, Non-Concur)
 - Error indication as appropriate - error plus cause (reference to constraint)
 - Route / 4DT proposal (optional)

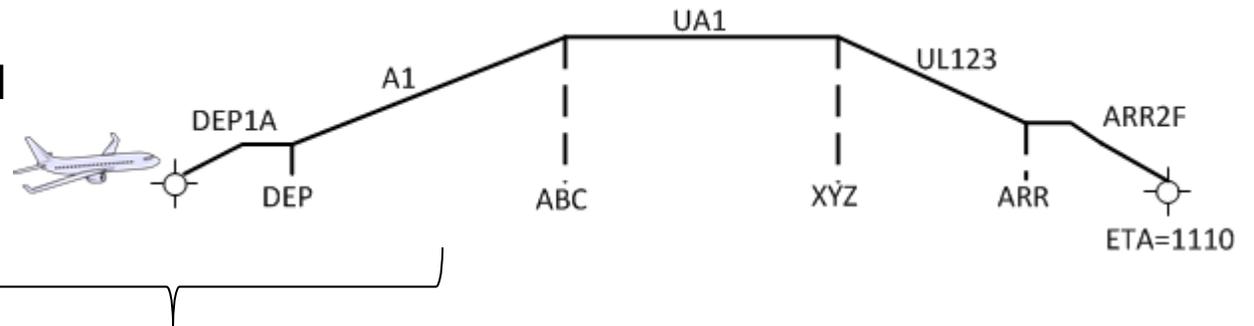
TBO Prerequisites

- Higher granularity / fidelity → discrepancies are immediately obvious - no hiding place
- Consistent AIM/ATM data
 - Airports, ATS routes, Airspaces, etc.
 - Constraints – static, dynamic, ATFM measures
- Met data
 - Same Met data / knowledge of Met data applied

Trajectory Prediction - Today

Operator

Business parameters,
Flight parameters, Fuel costs,
ATM procedures & constraints

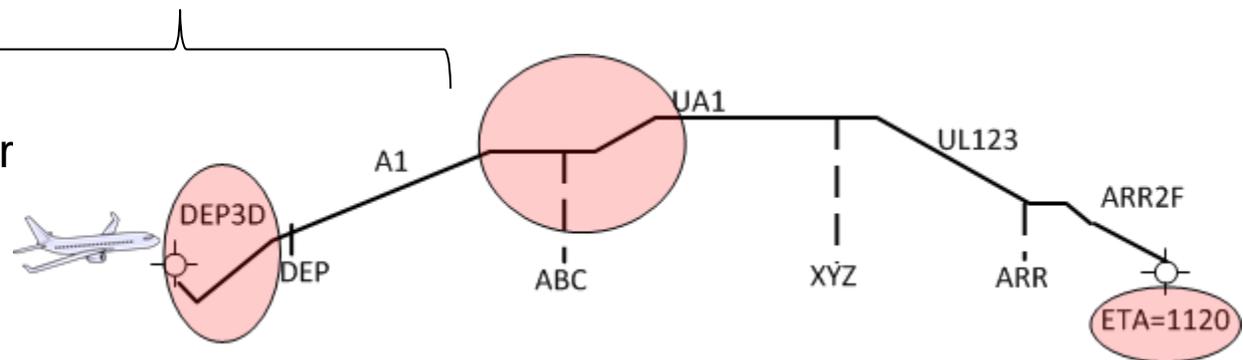


- ADEP 0945
- N0440F330 A1 ABC UA1 XYZ UL123

* No collaboration

ATM

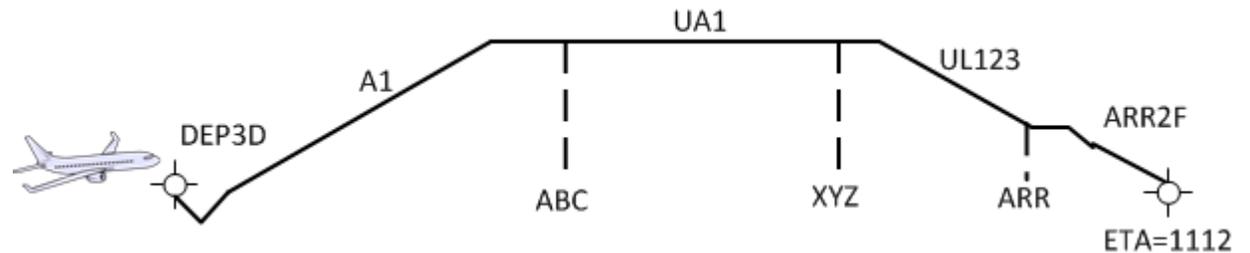
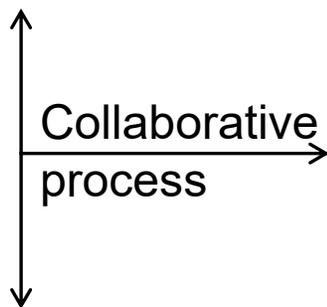
De-default flight parameter
ATM procedures & constraints



Trajectory Prediction - Tomorrow

Operator

Business parameters, Flight parameters,
Fuel costs,
ATM procedures & constraints



ATM

De-default flight parameters
ATM procedures &
constraints

- ADEP 0945
-N0440F330 A1 ABC UA1 XYZ UL123

- State of Play

Provisions Development

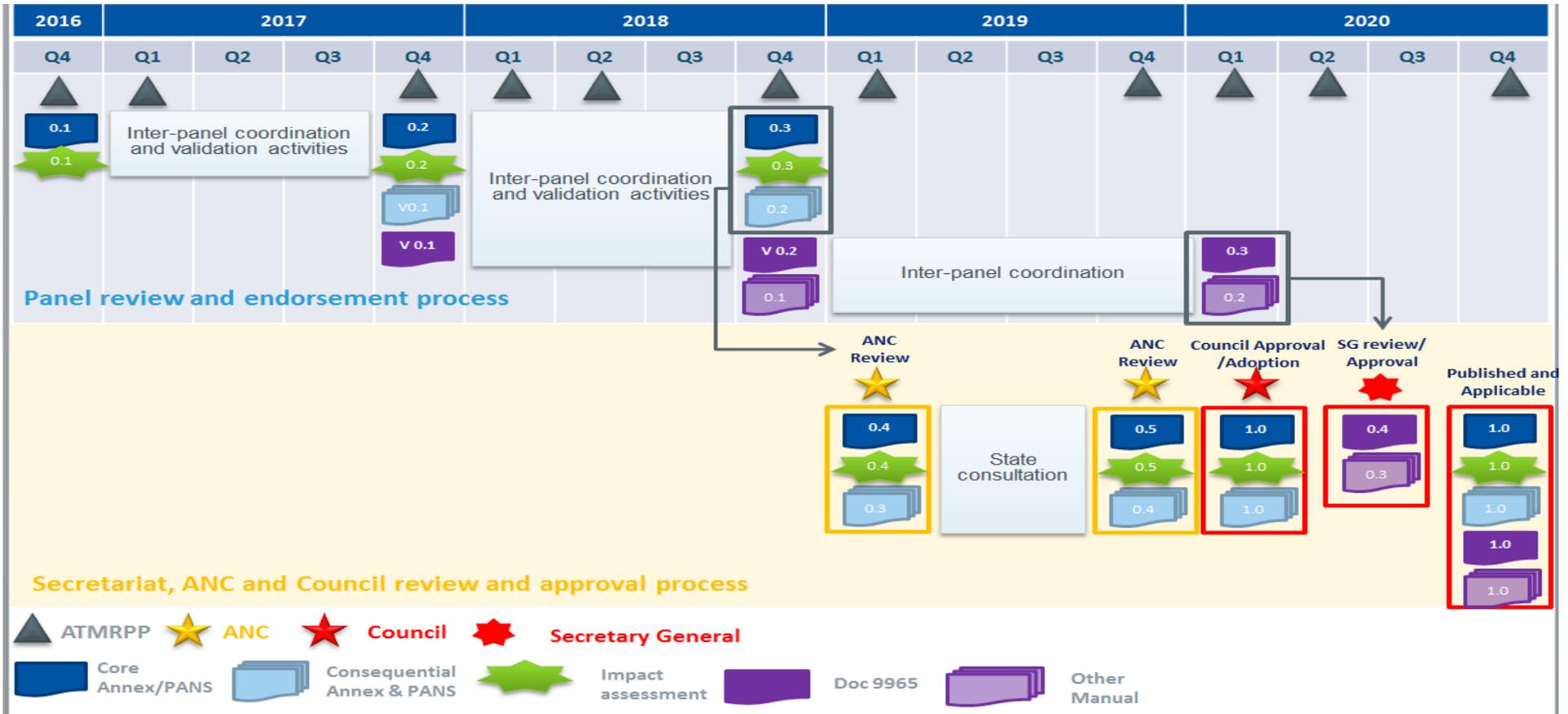
Focused on transition:

- Annexes
 - Annex 2 – submission procedure
 - Annex 15 – the need to publish requirements and capabilities with regard to FF-ICE

- PANS-ATM
 - Chapter 4 – inclusion of additional new format flight plan
 - New Chapter 17 ‘FF-ICE Messages’ – procedures related to FF-ICE

- Manual on FF-ICE (Doc.9965)
 - New Part – ‘Implementation Guidance’ – guidance material including material expected to be ‘elevated’ to a new PANS-ATM Appendix in due time

Provisions Timeline



Implementation Considerations

- Benefit driven - No big bang
- Mixed mode
 - Data: Enabled (FF-ICE) / Non-enabled (FPL2012) – even for the same flight plan!
 - Procedures: FF-ICE Provisions / Current Provisions
 - Technology: AFTN (AMHS), SWIM (Publish & Subscribe)
- No modifications to existing FPL format

End of Presentation

Thank you for your
Attention

