



ICAO MID



الهيئة العامة للطيران المدني
GENERAL CIVIL AVIATION AUTHORITY



CCO-CDO Workshop

ICAO MID Workshop on the Continuous Climb Operations (CCO) /
Continuous Descent Operations (CDO) Implementation

Abu Dhabi, UAE

13 – 14 June 2022

CCO/CDO implementation process



Principles of CCO/CDO

- Airspace design, instrument flight procedure design and Air Traffic Control (ATC) techniques should all be employed in a cohesive manner. This will facilitate the ability of flight crews to use in-flight techniques to reduce the overall environmental footprint and enhance the efficiency of the flight.
- Different techniques being applied to maximize operational efficiency while still addressing local Airspace requirements and existing constraints.
- CCO/CDO is enabled by Airspace/flight procedure designer, facilitated by ATC and performed by Aircraft operators.
- The implementation may require specific operational changes, including training and basic knowledge.
- The effectiveness of implementation should be measured comparing with a base case, in collaboration with the stakeholders.



Stakeholders

The collaboration among the stakeholders involved in implementing CCO/CDO is essential for the success of implementation, the list includes:

a) Air Navigation Service Providers (ANSP), including:

- 1) Policy/Decision Makers;
- 2) Airspace Designers;
- 3) Procedure Designers; and
- 4) Operational ATC Staff;

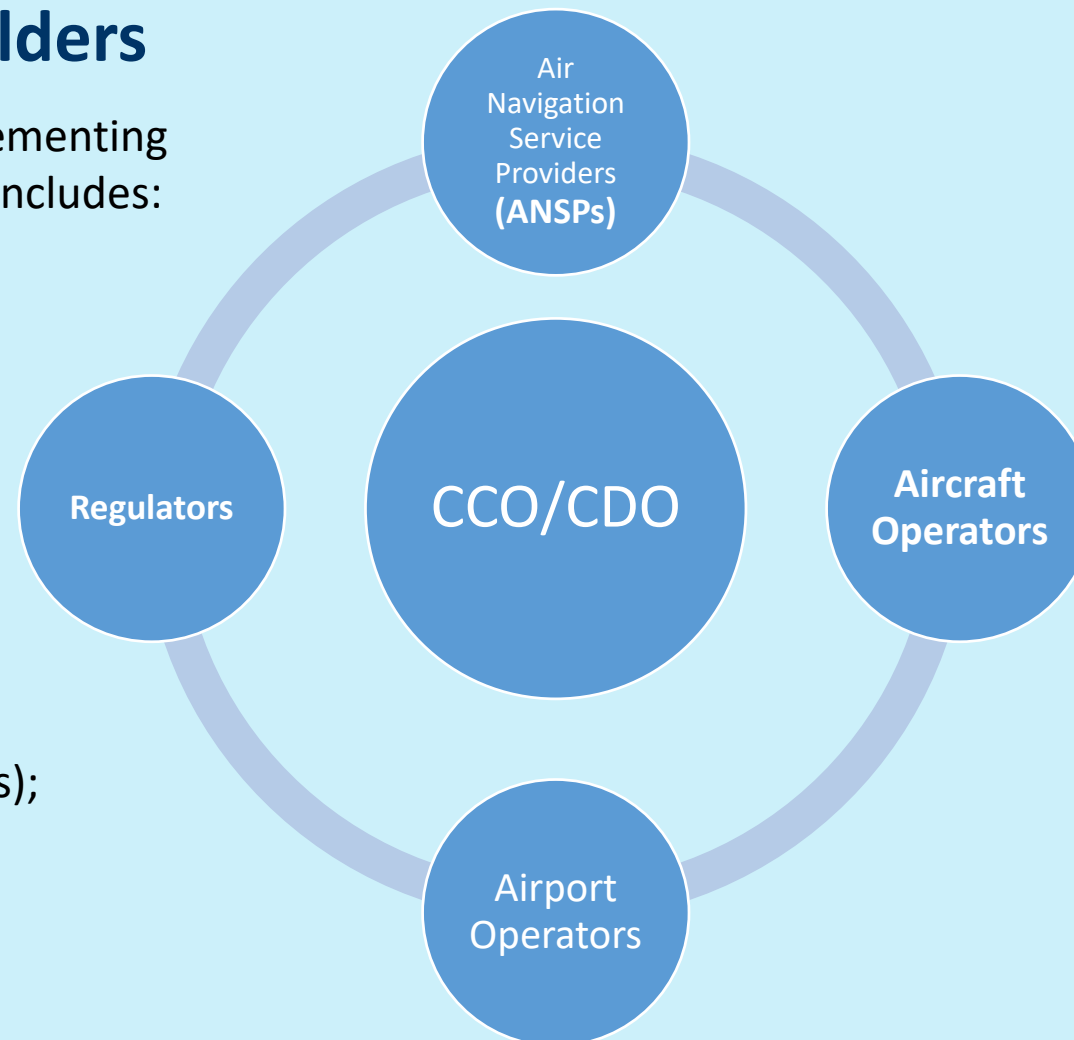
b) Aircraft Operators:

- 1) Policy/Decision Makers;
- 2) Operations (Pilots, flight planners and despatchers); and
- 3) Technical staff (fuel efficiency and performance specialists);

c) Airport Operators:

- 1) Operations Department (where it involves ATC TWR); and
- 2) Local society and Environment Department;

d) Aviation Regulators.





References

Annex 4: Aeronautical Charts

Annex 6: Operation of Aircraft, Part I: International Commercial Air Transport — Aeroplanes
Operation of Aircraft, Part II — International General Aviation — Aeroplanes

Annex 8: Airworthiness of Aircraft

Annex 10: Aeronautical Telecommunications, Volume I — Radio Navigation Aids

Annex 11: Air Traffic Services

Annex 15: Aeronautical Information Services

Annex 19: Safety Management

Doc 4444 (PANS-ATM): Procedures for Air Navigation Services — Air Traffic Management

Doc 8168 (PANS-OPS): Procedures for Air Navigation Services — Aircraft Operations Volume I — Flight Procedures Volume II
— Construction of Visual and Instrument Flight Procedures

Doc 9426: Air Traffic Services Planning Manual

Doc 9689: Manual on Airspace Planning Methodology for the Determination of Separation Minima

Doc 9849: Global Navigation Satellite System (GNSS) Manual

Doc 9859: Safety Management Manual (SMM)

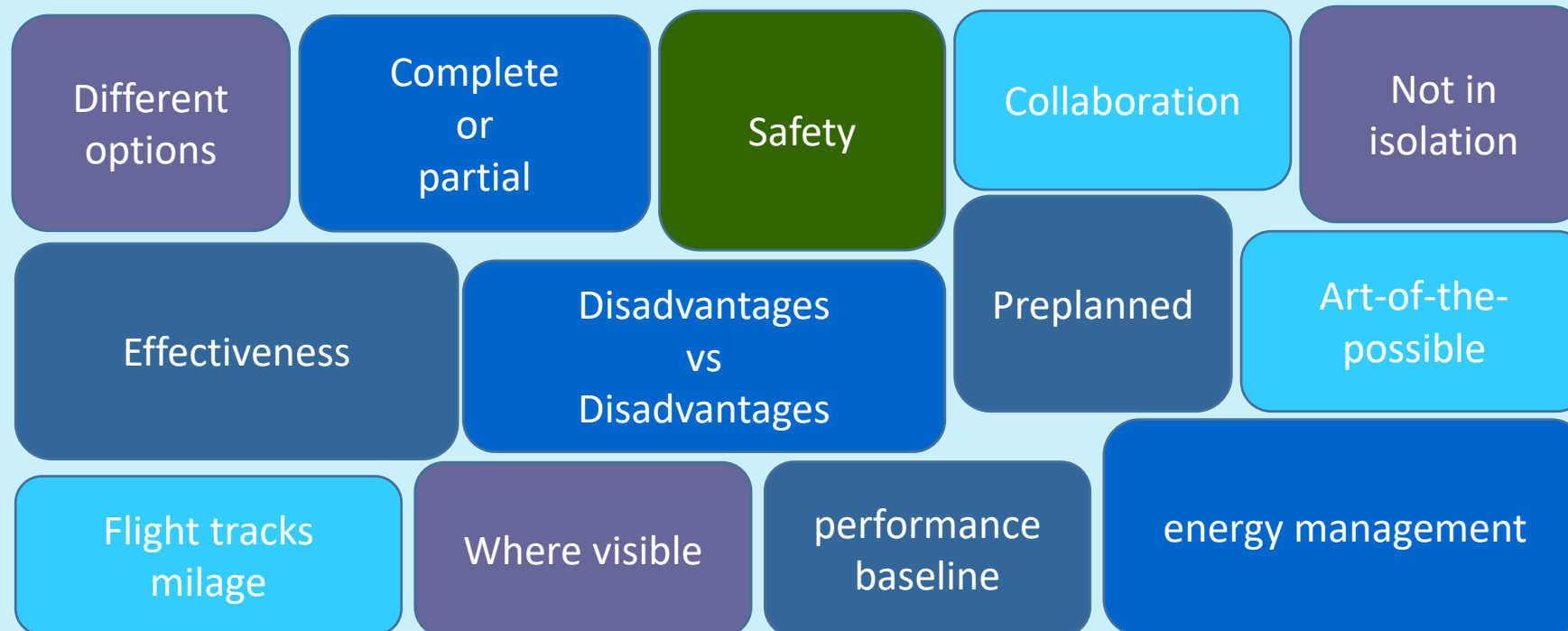
Doc 9931: Continuous Descent Operations (CDO) Manual

Doc 9993: Continuous Climb Operations (CCO) Manual

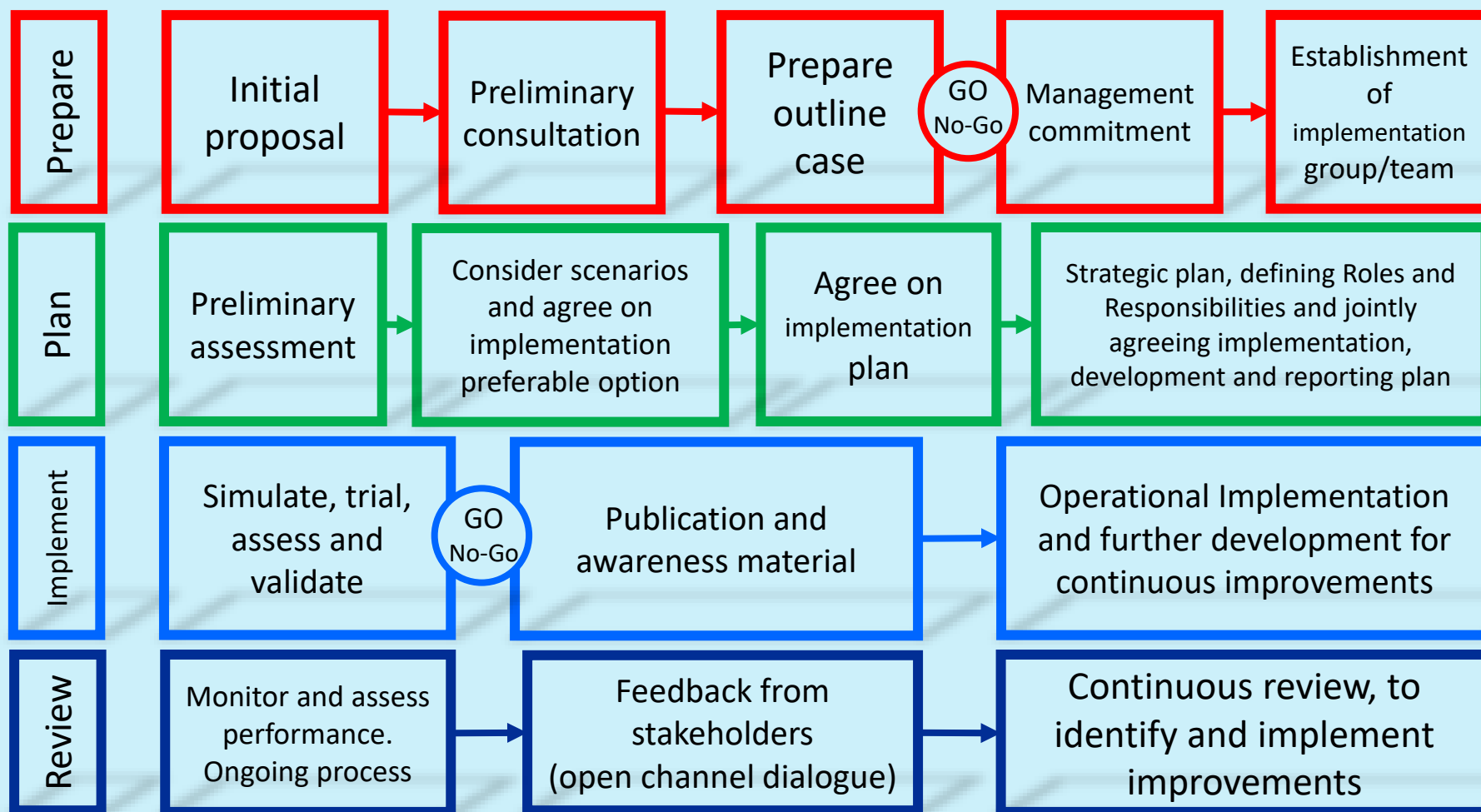


IMPLEMENTATION OVERVIEW AND PREREQUISITES

Implementation principles

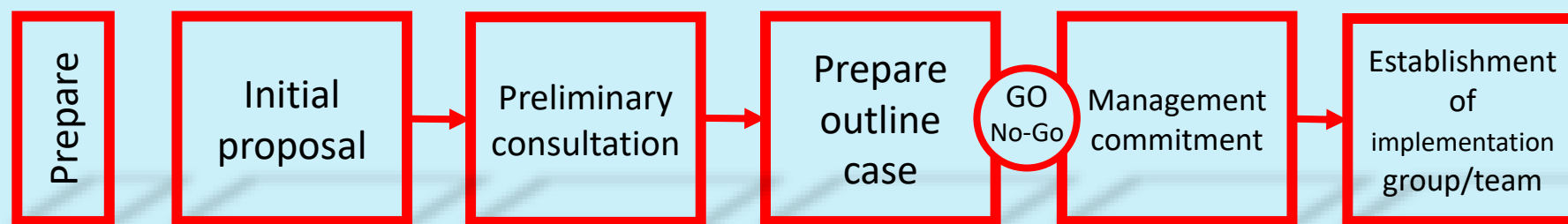


Implementation roadmap





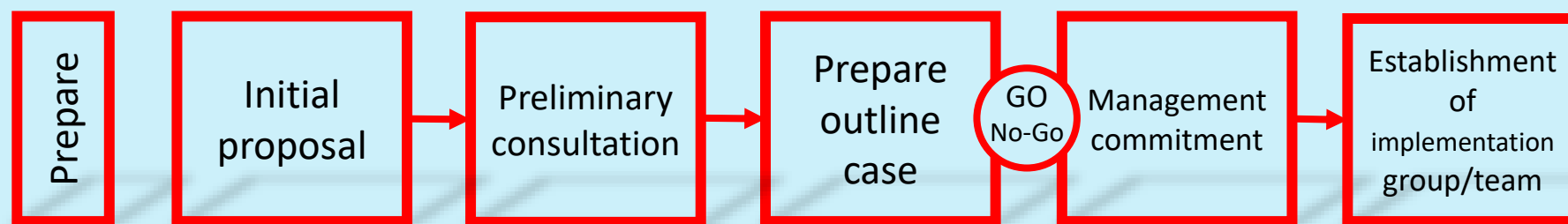
Preparation (Pre-Planning) phase



- The initiation of an airspace implementation may be proposed by any operational stakeholder, referred to as the “initiator”. However, the initiator may not be able to undertake a full preliminary assessment.
- The initial assessment might be conducted with the support of the other stakeholders considering national regulation and guidance, Airspace policy, development plans and other sources, this will enable the stakeholders to develop an initial proposal for the preliminary consultation process.



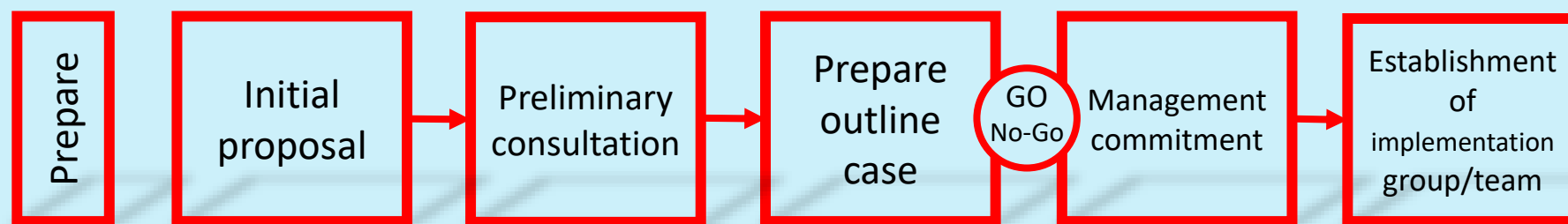
Preparation (Pre-Planning) phase



- At this stage, a preliminary report should be developed to secure the interest from fellow operational stakeholders. Whom together will reach a Go-No-Go decision for further processing. Normally through a workshop where all parties presents their views.
- Typically, the workshop participants could include representatives from Aircraft operators, ANSPs, Aerodrome operator (environment department), regulators and State representatives.



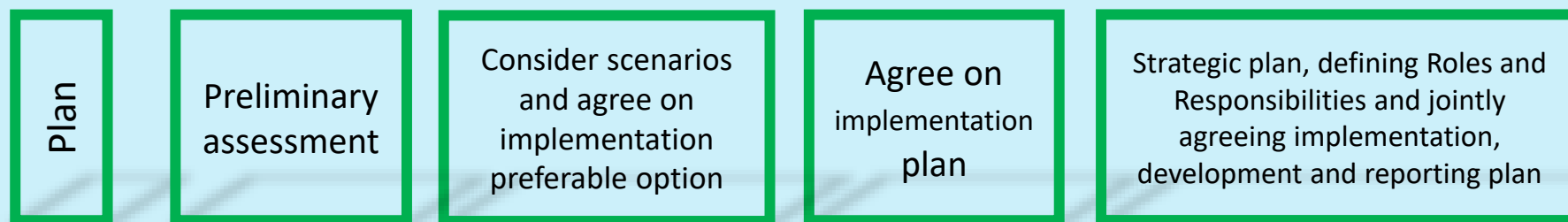
Preparation (Pre-Planning) phase



- Once the management commitment is confirmed, the previous consultation and agreements should be consolidated in a formal working arrangement under an implementation working group.
- The initial tasks of the group would be included in a Terms of Reference (ToRs), ensuring a common understanding of the work and the expected outcomes, and to agree on a roadmap including assignment of tasks and responsibilities of each party.



Planning phase

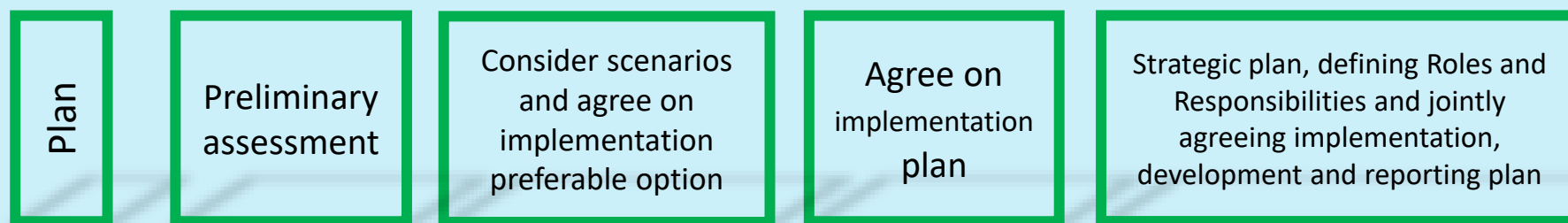


The preliminary assessment, will require joint consideration of:

- a) what is the base case (current situation);
- b) what are expected changes, and the measurement of expected performance, i.e. positives and negatives (pros and cons)?
- c) what direct and indirect barriers, enablers and risks (at a high level); and
- d) what alternatives and options could be considered.



Planning phase

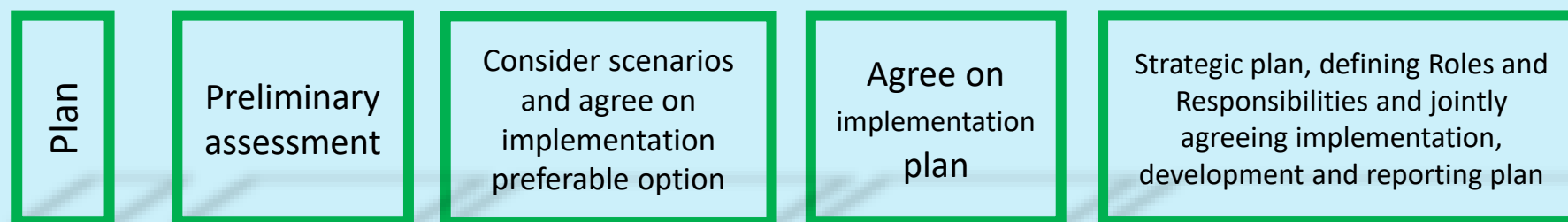


The scope for the preliminary assessment should be wide but outlined in depth and should consider fundamental issues such as:

- a) how do arrivals and departures interact; using archived data (for example, from track monitoring systems like Surveillance/flight data recordings)
- b) what are the present vertical profiles of ARR/APPs vs DEPs trajectories, and how much level flight constrains are there?
- c) how much CCO/CDO occurs at present;



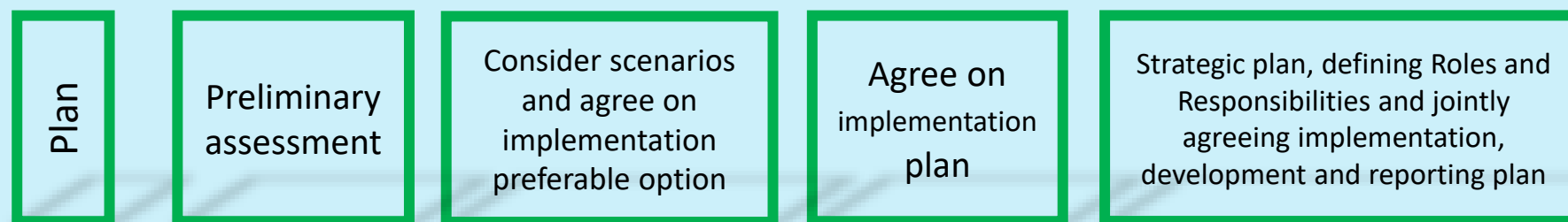
Planning phase



- d) what are the relevant national regulations and policies? for example, consultation requirements; and much it could delay the implementation;
- e) where do aircraft fly in relation to population concentration;
- f) what relevant plans or developments are planned within the Airspace;
- g) what change to noise impact may occur, for example, a change to geographical locations of noise impact, concentration or dispersion of noise impact;



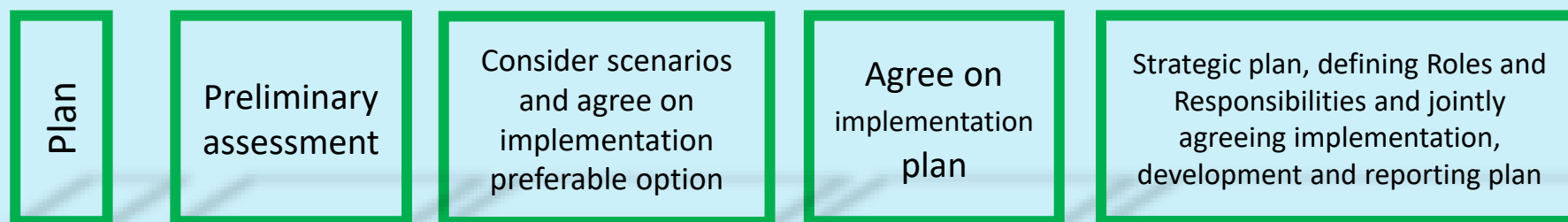
Planning phase



- h) what capabilities will be needed, in terms of, ATC training and flight simulation, monitoring and feedback mechanism;
- i) what related effects/impacts may exist? for example, effects on capacity;
- j) what risks exist and what mitigation is required? for example, how may traffic growth will affect the ability to perform enhancements?



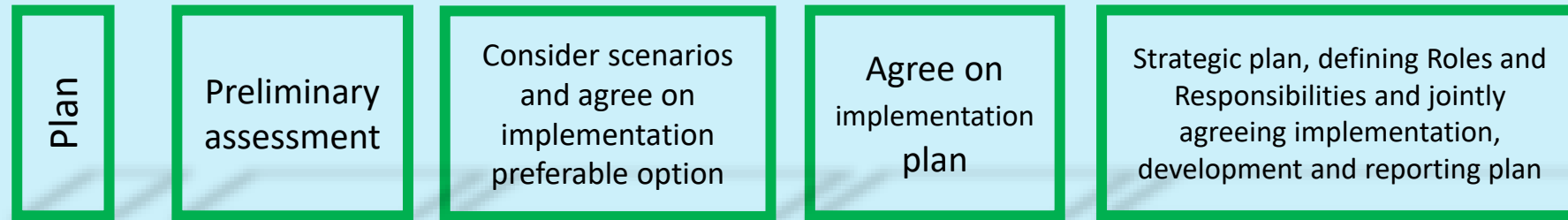
Planning phase



- k) what “quick-win opportunities” exists? for example, rapid implementation of tactical CDO in very low traffic scenarios (phased implementation approach);
- l) measuring the required airspace changes or procedures to amend; and
- m) Measuring the training requirements,



Planning phase

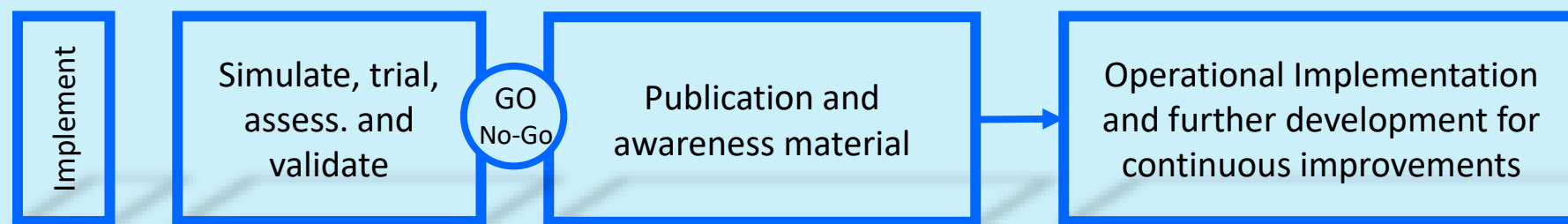


The strategic planning (project management) should include the following:

- a) basic project management document;
- b) phases of development, Milestones and Action Items;
- c) critical path activities and their management;
- d) roles and responsibilities;
- e) reporting mechanism or structures;



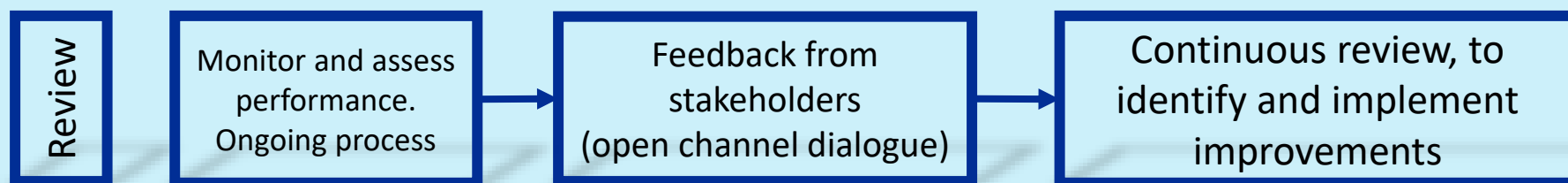
Implementation phase



The implementation phase involves more detailed data, including simulation results to valid the proposals and adapt a preferred options (including the relational behind the decision), in order to populate the safety assessment, and further develop the strategic plan to an implementation plan, detailing the changes to be introduced, involvement of systems and human factors, the training requirements, anticipated events (planned or unplanned), and reporting of emerging safety related issues; all of this may require the national regulator endorsement.



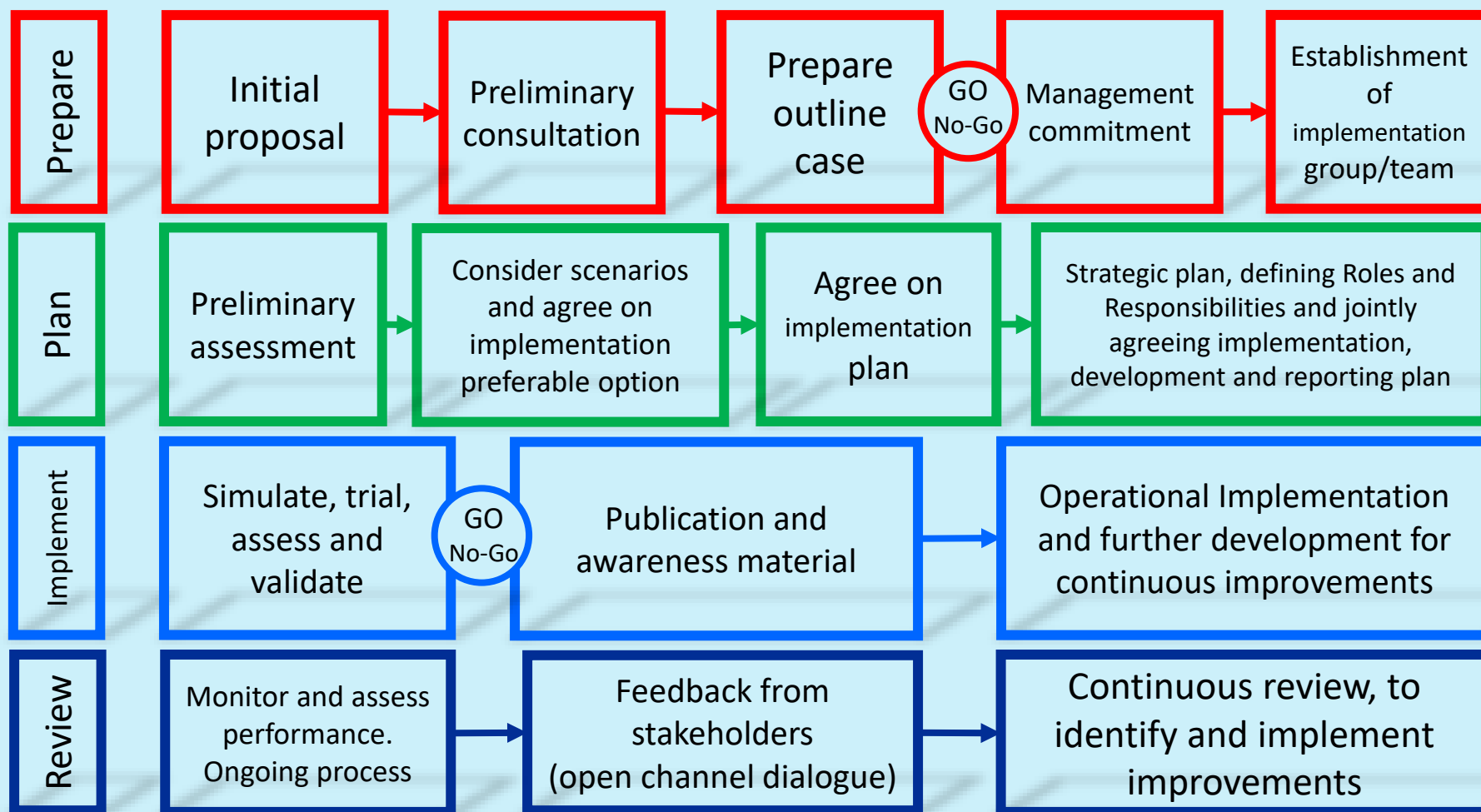
Review phase



Regular feedback on the performance from all involved operational stakeholders is critical to the successful implementation and continued application. Equally critical is offering those involved with the implementation a “just-culture” reporting channel for reporting safety concerns and proposing improvements.

Any reported safety concern should be addressed as a matter of priority. It is also essential to address specific improvements identified by the more formal review of specific issues that arise as part of performance monitoring.

Implementation roadmap





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THANK YOU

