

*One sky for Europe*



# A-SMGCS

EUROCONTROL Project

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Project Manager



# Eurocontrol Airport Operations Programme

- ◆ Consists of four main projects:
  - A-SMGCS
    - Airport CDM Applications
    - Airside Capacity Enhancement
    - Runway Safety
- ◆ Also involved in Wake Vortex
- ◆ Timeframe 2002-2006

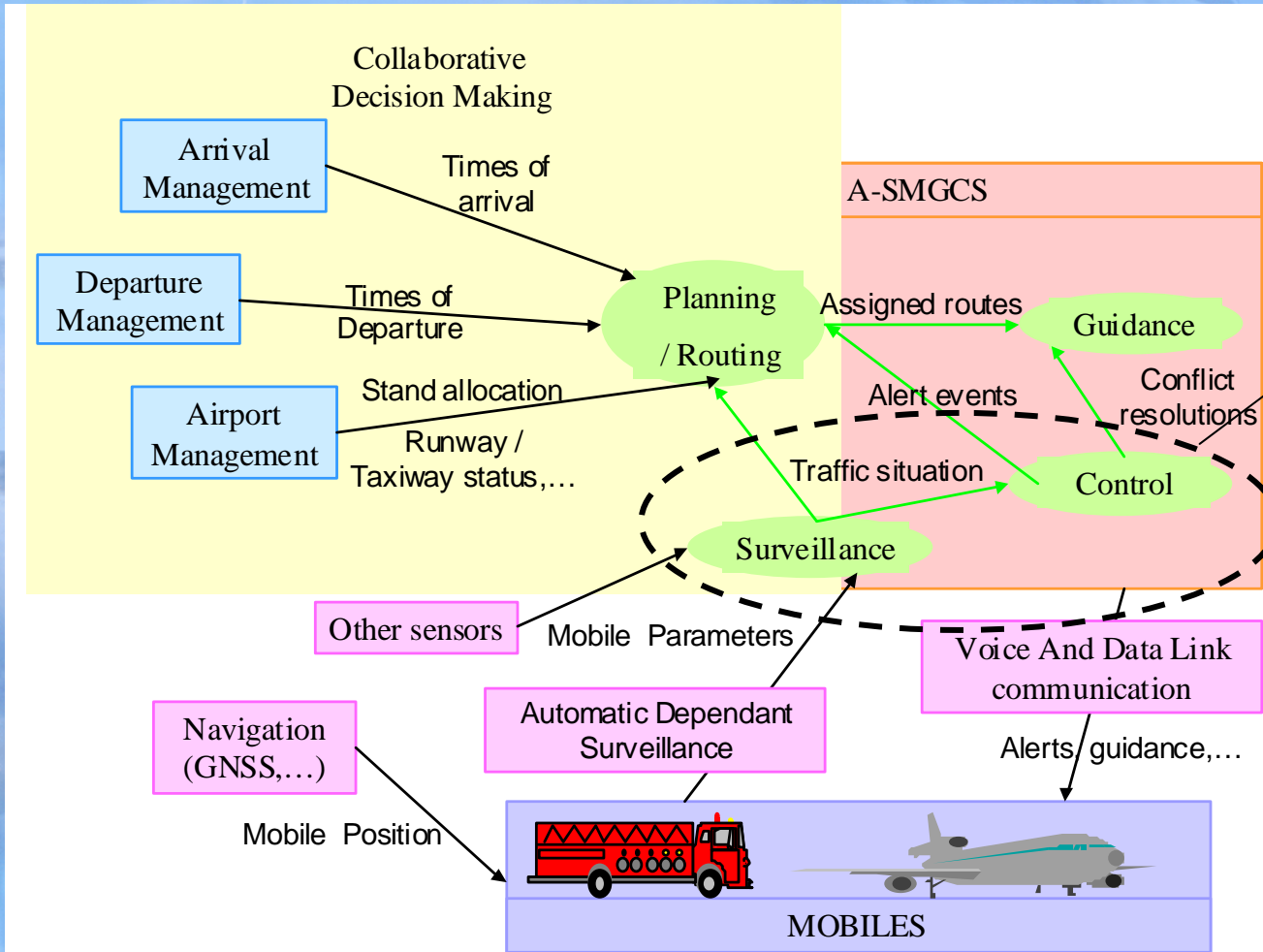
# A-SMGCS Project

- ECAC-Wide
- Identifies & addresses implementation issues
- Based upon several agreed & validated Implementation Levels, enabling:
  - Evolutionary implementation
  - Local needs to be met
- Supported by:
  - ECIP Process
  - Regulation
  - Guidance material
- Integral component of APR & EATM

# Project Objectives

- To fully develop A-SMGCS Levels 1 & 2, ensuring that all issues relevant to operational implementation are identified and addressed:
  - Systems
  - Procedures
  - Human Factors
  - Institutional
  - Training/Licensing
- Coordinate with & expand upon the work of EC & ICAO;
- Coordinate with FAA, NAV CANADA etc.

# A-SMGCS Context & Project Scope

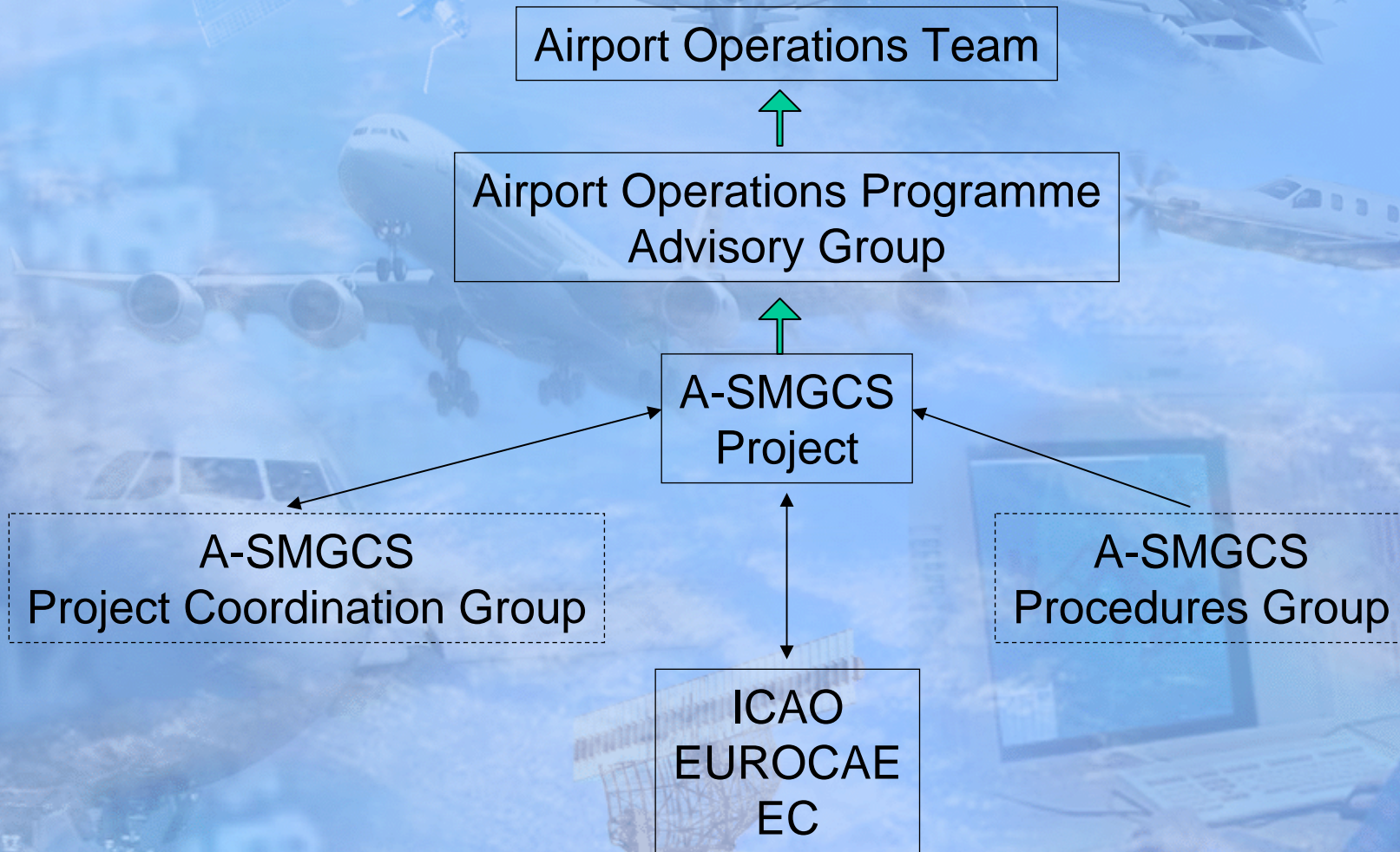


Project Scope

# Outline of Project Phases

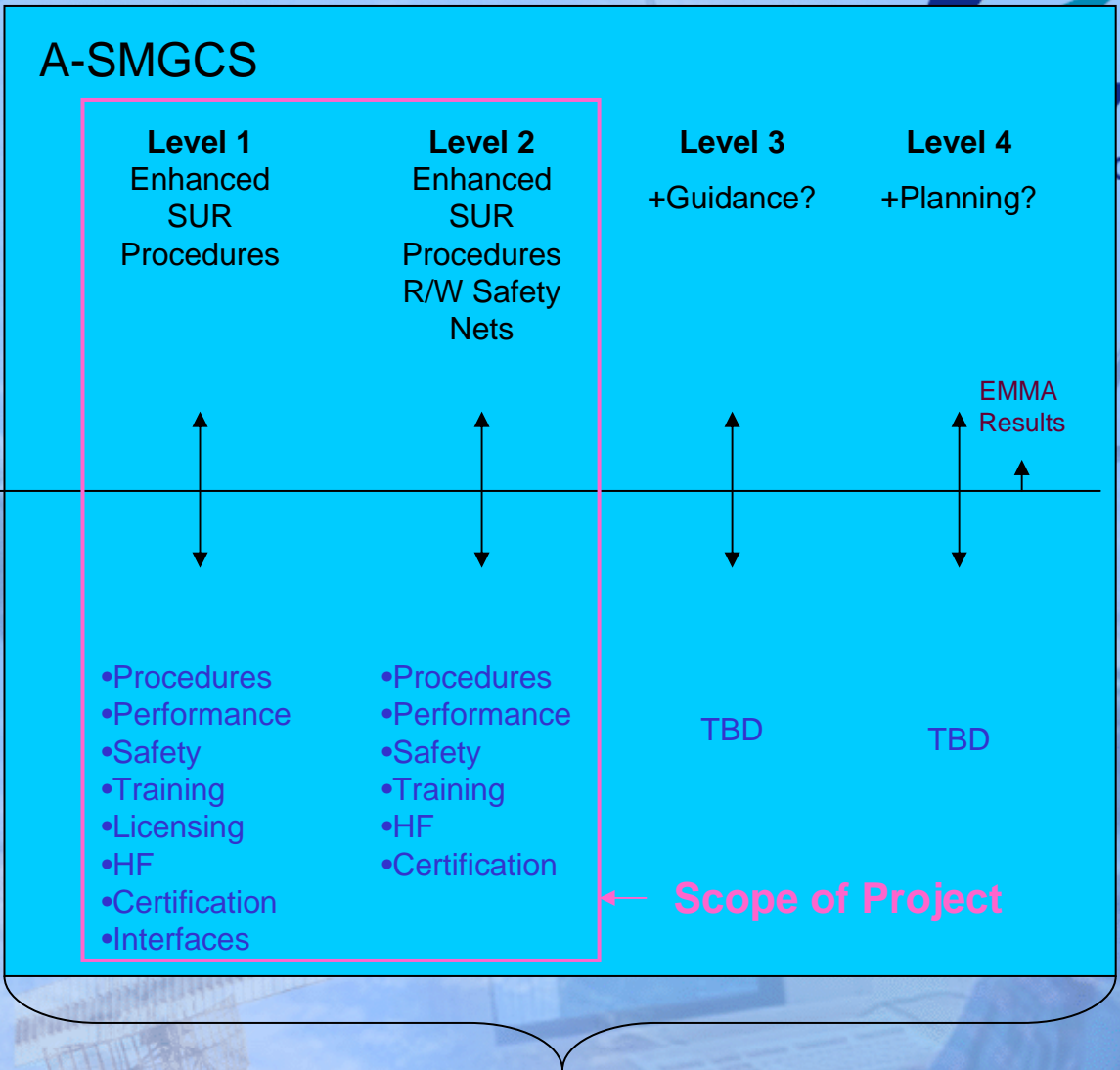
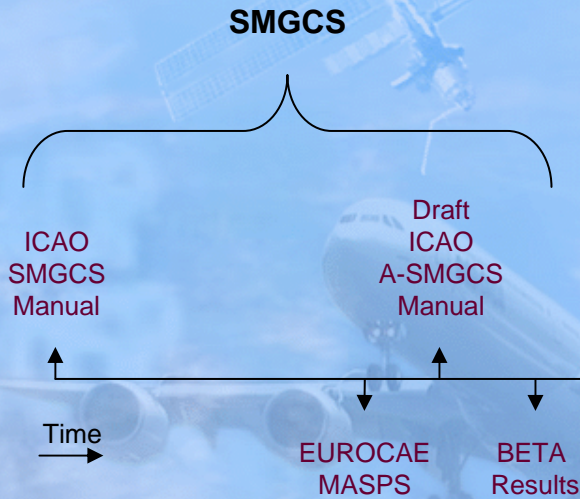
- Requirements Definition
  - Operational Requirements
  - Operational Concept
  - High Level Functional Specifications
- Evaluation & Validation
  - Simulation
  - Live trials at representative airports
  - Focus on safety, throughput, human factors, procedures and tools
- Update of Requirements
  - Updated & agreed requirements documentation for Levels 1 & 2
- Support to Implementation
  - Guidance material
  - ECIP objectives & regulation (as agreed & required)
  - Updates for ICAO & other documentation
  - Licensing, training etc.

# Project Organisation



# What are 'A-SMGCS Levels'?

- Level 1
  - Based upon improved surveillance (cooperative independent, dependent or multilateration) and procedures (identification, issuance of ATC instructions & clearances)
- Level 2
  - Safety nets (runway, 'restricted' areas) and associated procedures
- Level 3
  - Detection of all conflicts on movement area, improved guidance & planning (for controllers)
- Level 4
  - Resolution of all conflicts, automatic planning & automatic guidance for (pilots & controllers)



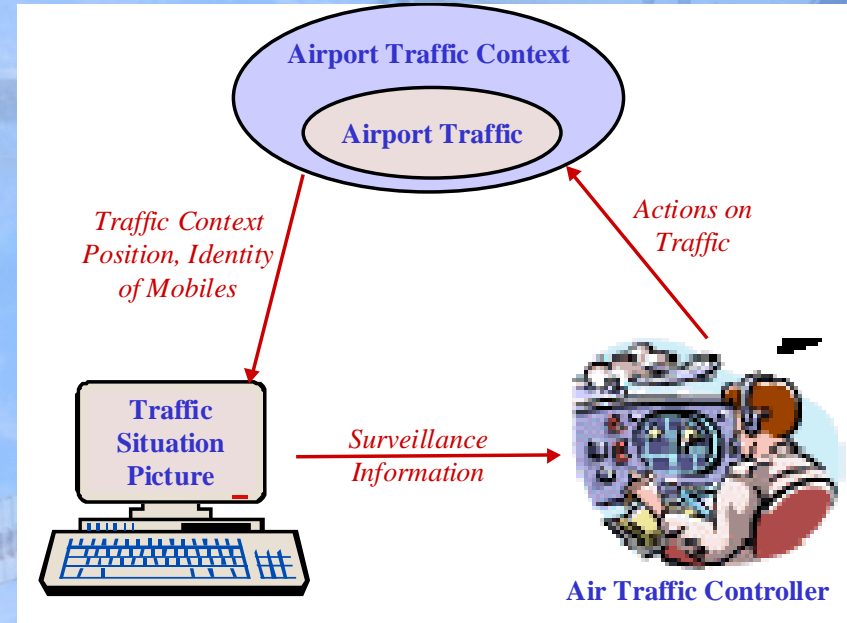
## Harmonised Application of SMGCS

### A-SMGCS Implementation Levels

Showing evolutionary levels & issues to be addressed

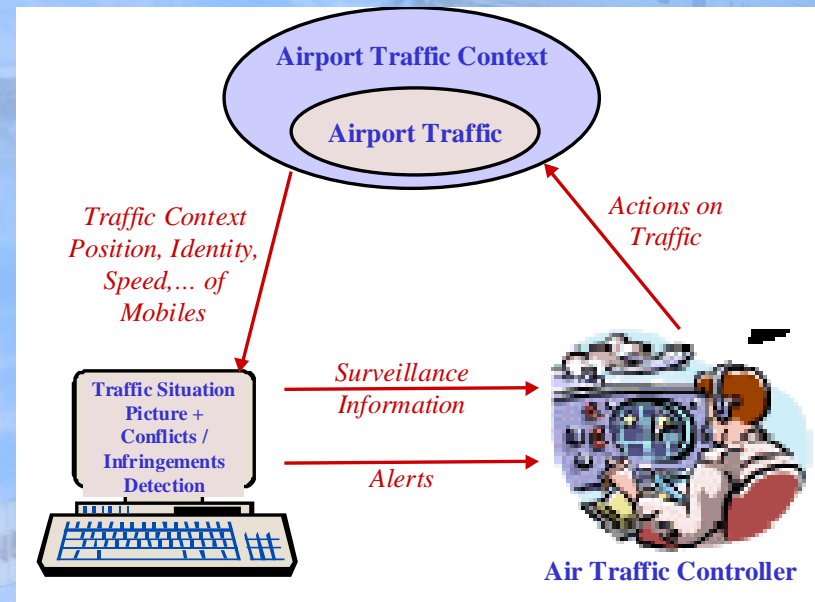
# Level 1

- A-SMGCS Surveillance
- Manoeuvring Area for Vehicles
- Movement Area for Aircraft
- Cooperative & Non-cooperative Surveillance
- Display
  - Traffic ‘Context’
  - Position
  - Identity
- Performance based upon ICAO/EUROCAE



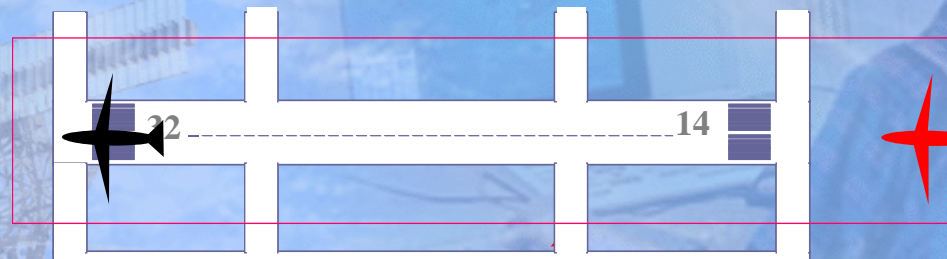
# Level 2

- A-SMGCS Surveillance + (elementary) Control
- Conflicts/infringements between all mobiles on runways
- Incursion into ‘restricted areas’ by aircraft
- Appropriate alert to controllers
- Intended as a commonly agreed ‘minimum’ safety net



# Level 2 Runway Safety Net

- Aimed at detecting potentially dangerous scenarios
- Addresses aircraft & vehicles (not persons)
- Does not vehicle/vehicle conflicts
- ‘Generic’ scenarios identified for:
  - Single runway
  - parallel runways
  - Intersecting runways
- Multiple conflicts to be considered as multiple pairs
- Two warning types
  - Prediction
  - Alert
- Parameters for:
  - Normal Visibility
  - Low Visibility



# Need for A-SMGCS Procedures

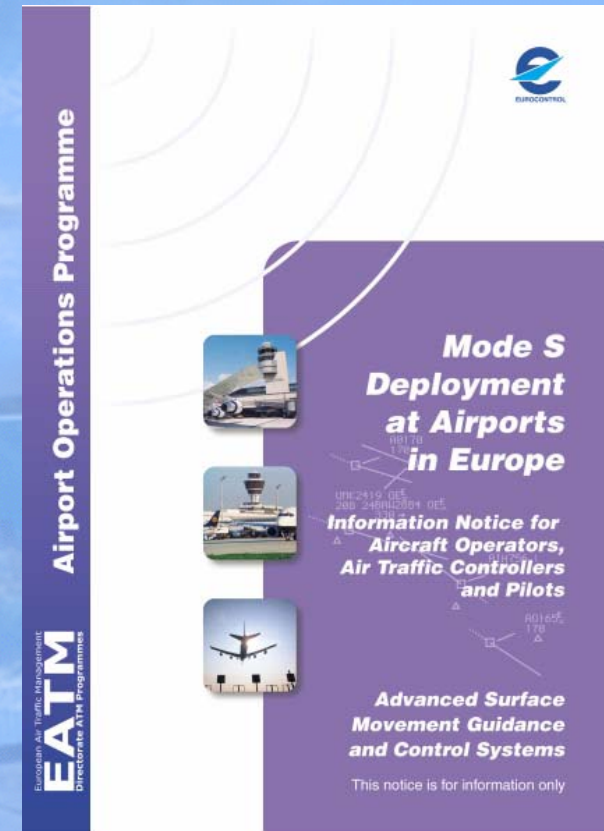
- No provisions addressing use of A-SMGCS Surveillance
- Ambiguities with respect to the use of SMR:
  - Interpretations of ‘augment’ & ‘assist’
  - Diverse uses/procedures
- Need for harmonised use of A-SMGCS surveillance data
  - Concerns Controllers/Pilots/drivers
  - Global application, increased traffic in all weather conditions
- Basis for further A-SMGCS developments
- Need to deliver benefits of A-SMGCS!

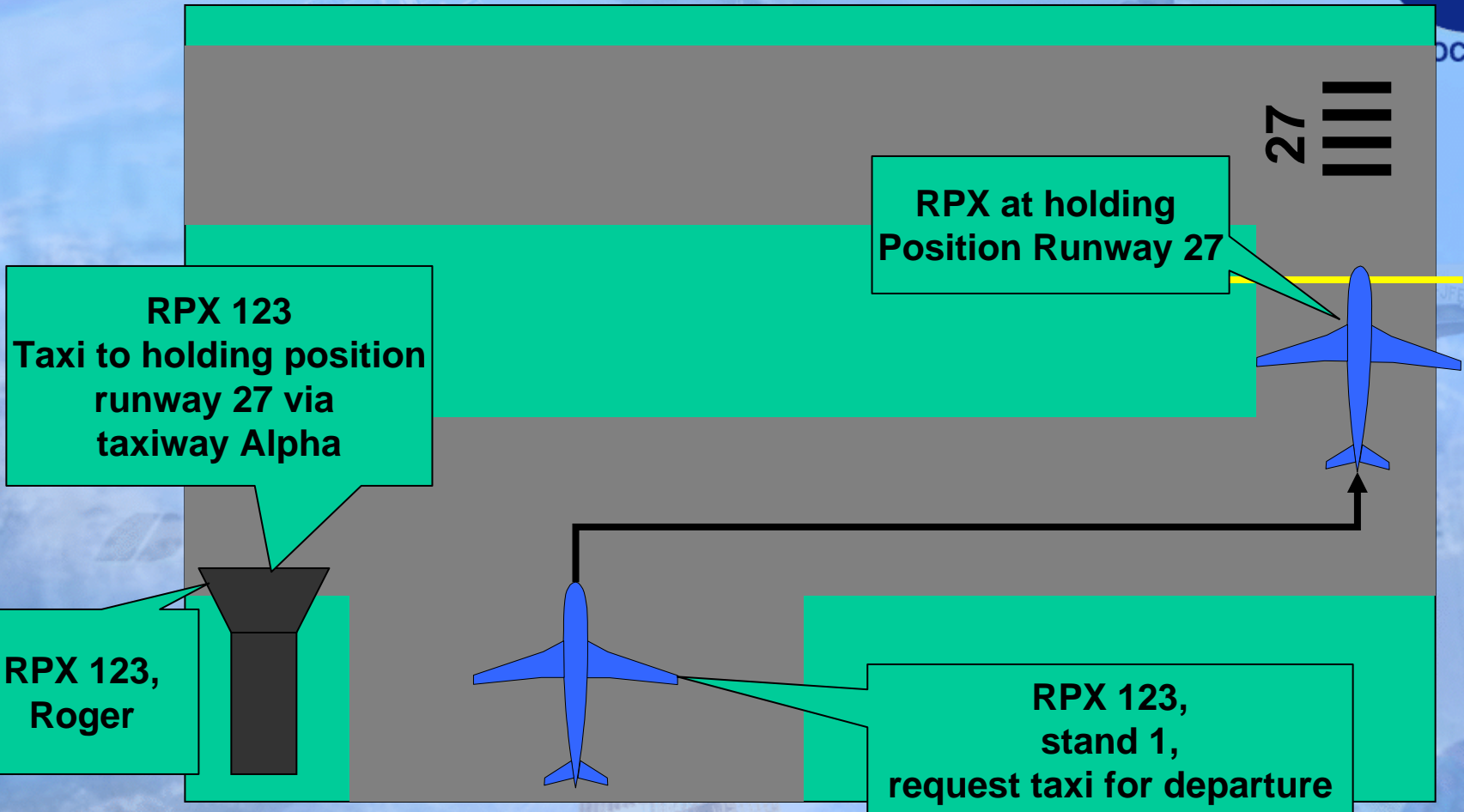
# A-SMGCS Procedures

- Transponder Operation
- Methods of identification
- Issuance of ATC instructions and clearances to aircraft & vehicles on the Manoeuvring area
  - Taxi Clearances
  - Resolution of conflicts
- Issuance of ATC instructions and clearances to aircraft and vehicles on the the runway
  - Conditional Clearances
  - Multiple line-up/intersection departures
  - Crossing
- Phraseology
- Contingency & Failure mode
- Low Visibility Procedures (transition from Visibility 2 to 3)

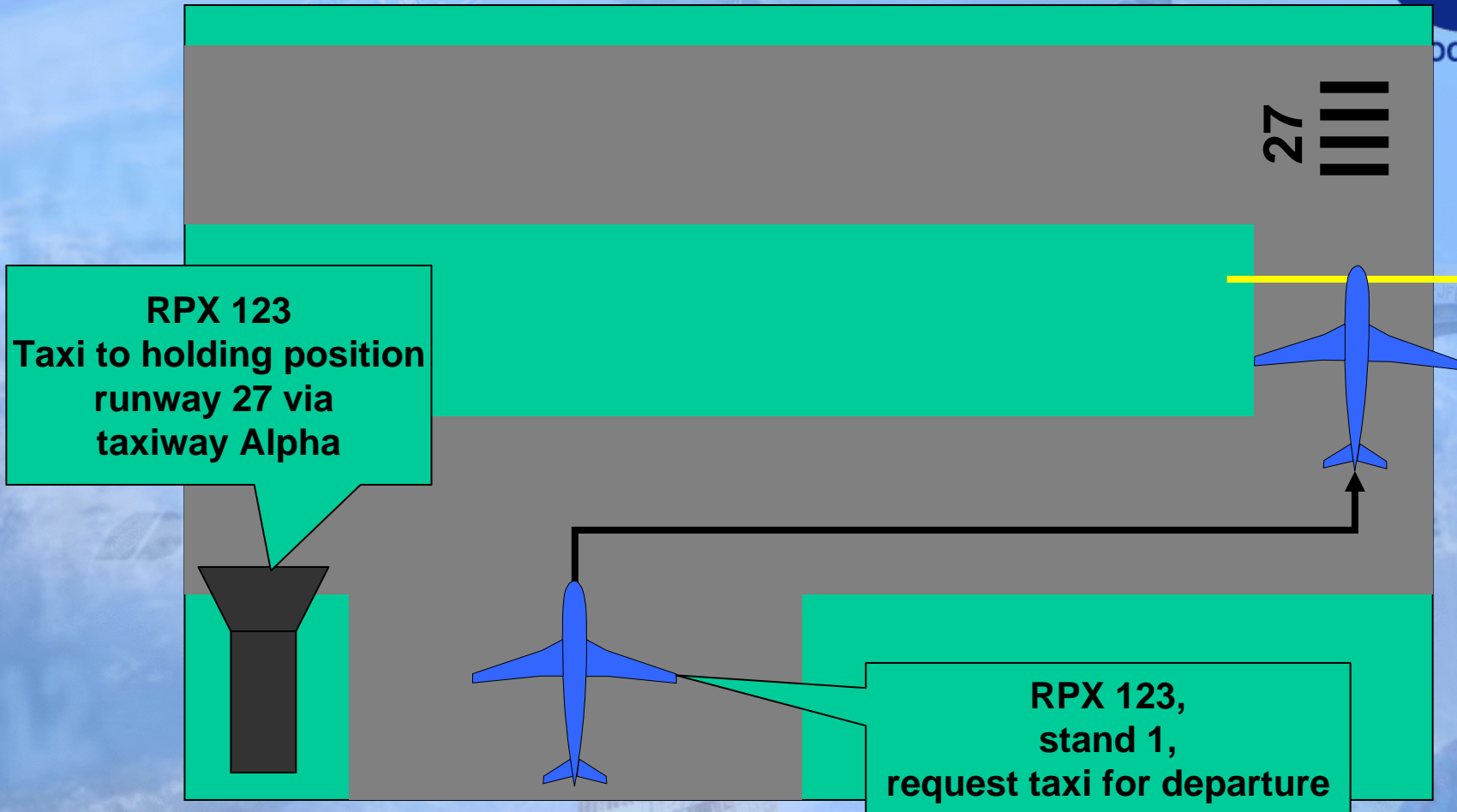
# Transponder Operating Procedures

- Pilots requested to switch on their transponders from:
  - From the request for push-back or taxi (whichever is earlier)
  - After landing, until the aircraft is parked on stand
- Use 'XPNDR' or equivalent mode
- Not use 'STBY' or 'OFF'
- AIP, AIC & Brochure

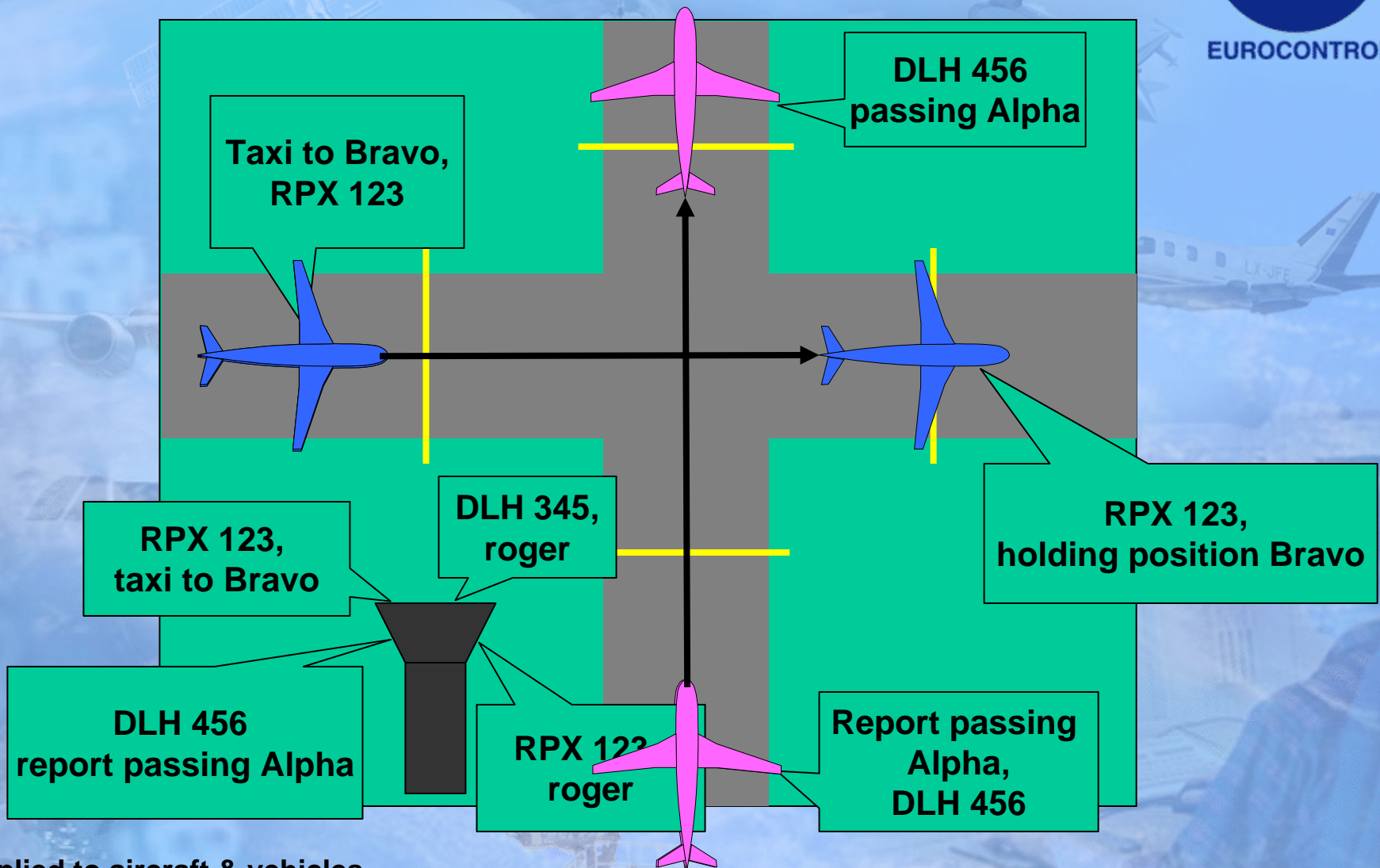




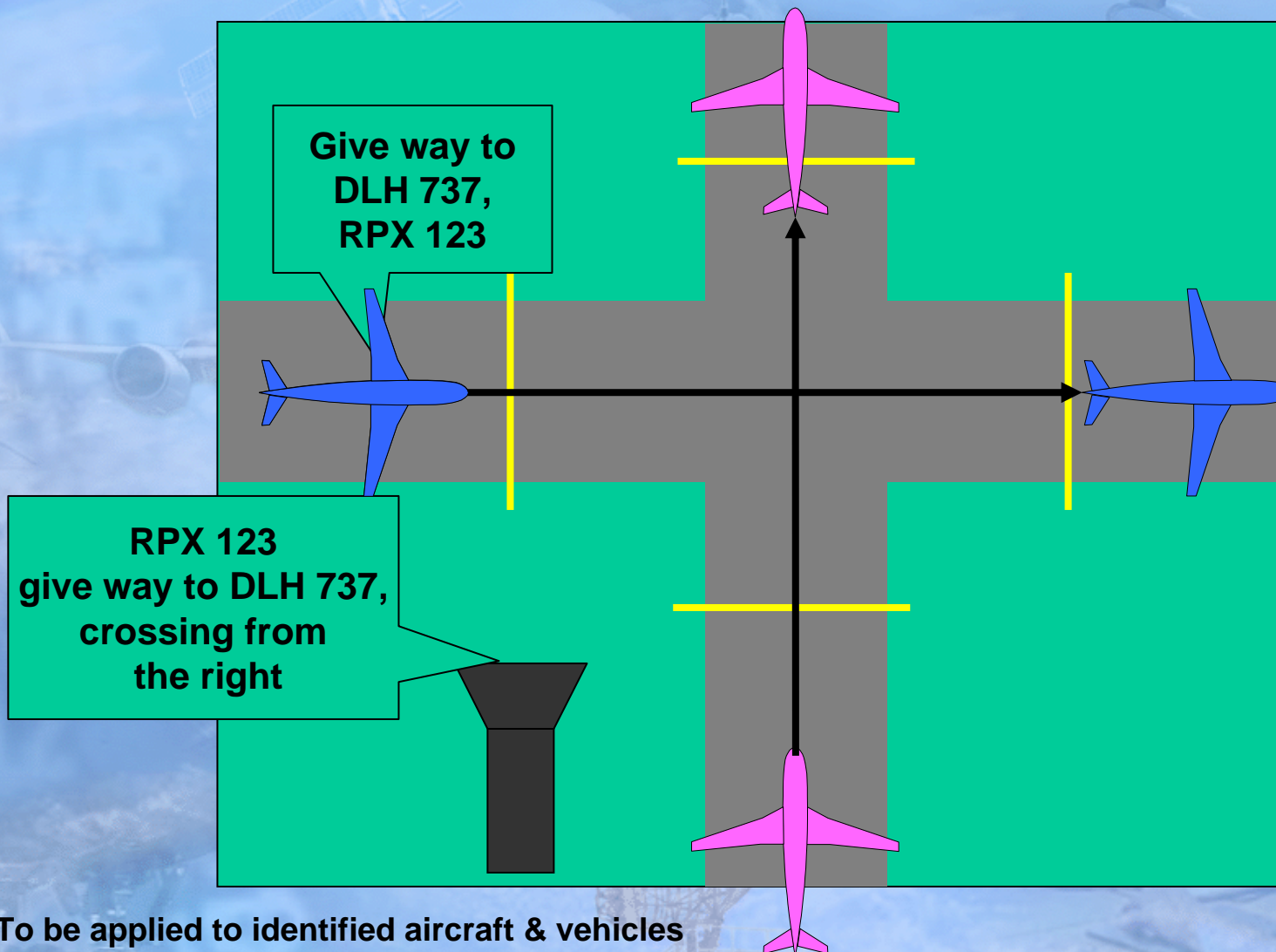
- Applied to aircraft & vehicles
- Applied in Visibility conditions (1), 2, 3 & 4



- To be applied to identified aircraft & vehicles
- Could be applied in Visibility conditions 1,2 & 3



- Applied to aircraft & vehicles
- Applied in Visibility (1), 2, 3 & 4



- To be applied to identified aircraft & vehicles
- To be applied in Visibility 1, 2 (& 3 with specific instructions)
- Could also be used to monitor 'procedural' separations in Visibility 3

# Licensing/Training

- Current provisions based upon the use of ‘SMGCS’, where SMR is used to ‘augment’ and ‘assist’.
- However, new European ATC License will support A-SMGCS
- Specific training requirements to be developed

# Implementation Mechanisms

- Best Practice
- Guidance Material
- ECIP
- Standards

Aim to ensure consistent application of A-SMGCS tools & procedures, which will build confidence amongst users and provide common specifications assist manufacturers.

# ECIP

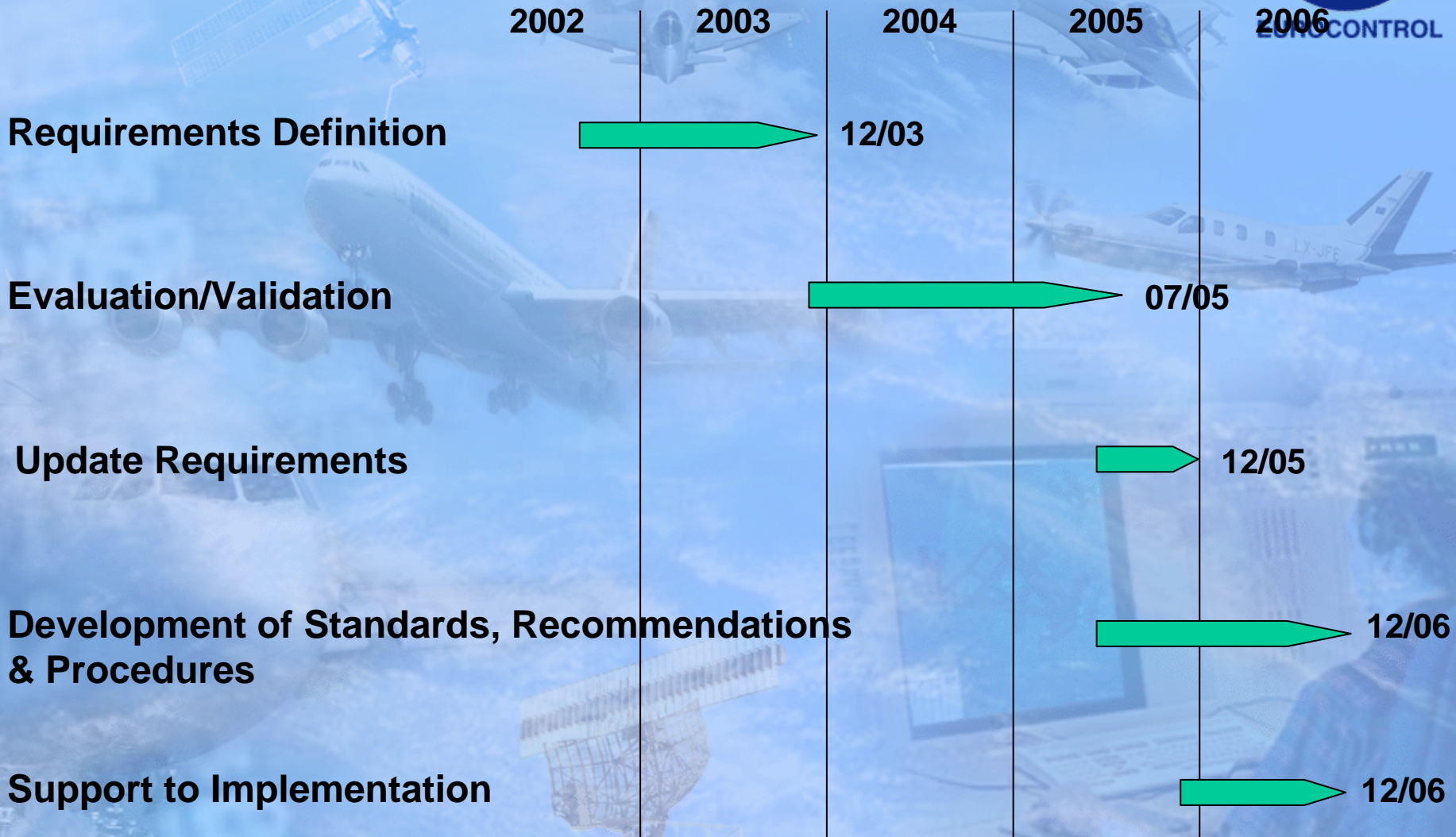
- A common planning and implementation document for improving European ATM, which specifies:
- What has to be achieved by States / ANSPs
  - Currently focuses on ACC capacity targets
  - Next steps aim to include airspace types, additional performance criteria (Cost effectiveness, Safety, Security and Environment)
  - inclusion of airports/TMA performance
- A list of solutions to achieve these targets:
  - ECIP implementation objectives
  - Working level (specialists teams) develop/review draft implementation objectives
- Endorsed by Provisional Council

# Current Status & Next Steps

- Agreed requirements documentation
- Agreed Procedures ‘concepts’
  - Mode S transponder Operating procedures
- Agreed Evaluation & Validation Process
- Call-for-Tender for Simulation issued
- Simulation preparation Starts 11/03
- Efforts to secure ‘Trial’ Airports



# Outline Roadmap



# Summary

- Still lot to do to secure actual & harmonised use:
  - Tools
  - Procedures
- Pragmatic approach is required, with full cooperation of ‘stakeholders’
- Harmonised approach to implementation is essential if benefits are to be brought to individual airports & the overall ATM network
- Global cooperation required (ICAO)

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# Contact

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**Thanks &  
Any Questions?**