PBN Airspace Design Workshop

AIRSPACE CONCEPT

Asia and Pacific Regional Sub-Office
Beijing, China

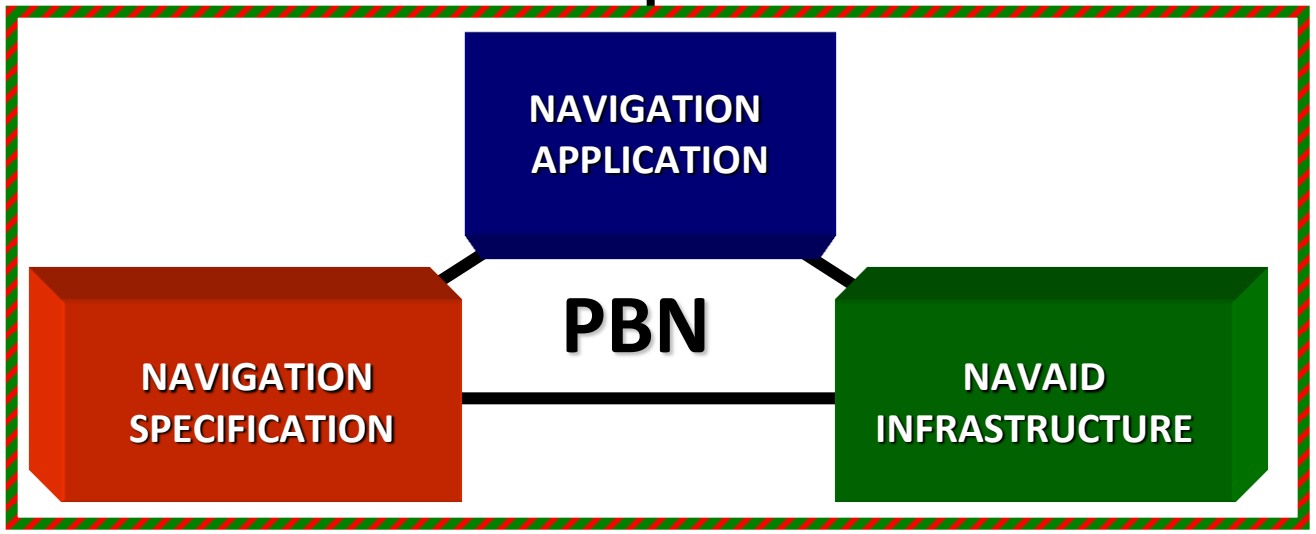
Learning Objectives

- What is an Airspace Concept
- Why develop an Airspace Concept
- Who develops an Airspace Concept
- What is needed to develop an Airspace Concept
- What happens after the Airspace Concept is developed
- Understand what the purpose of an airspace concept is, and how it should drive any successful implementation.

PBN in Context

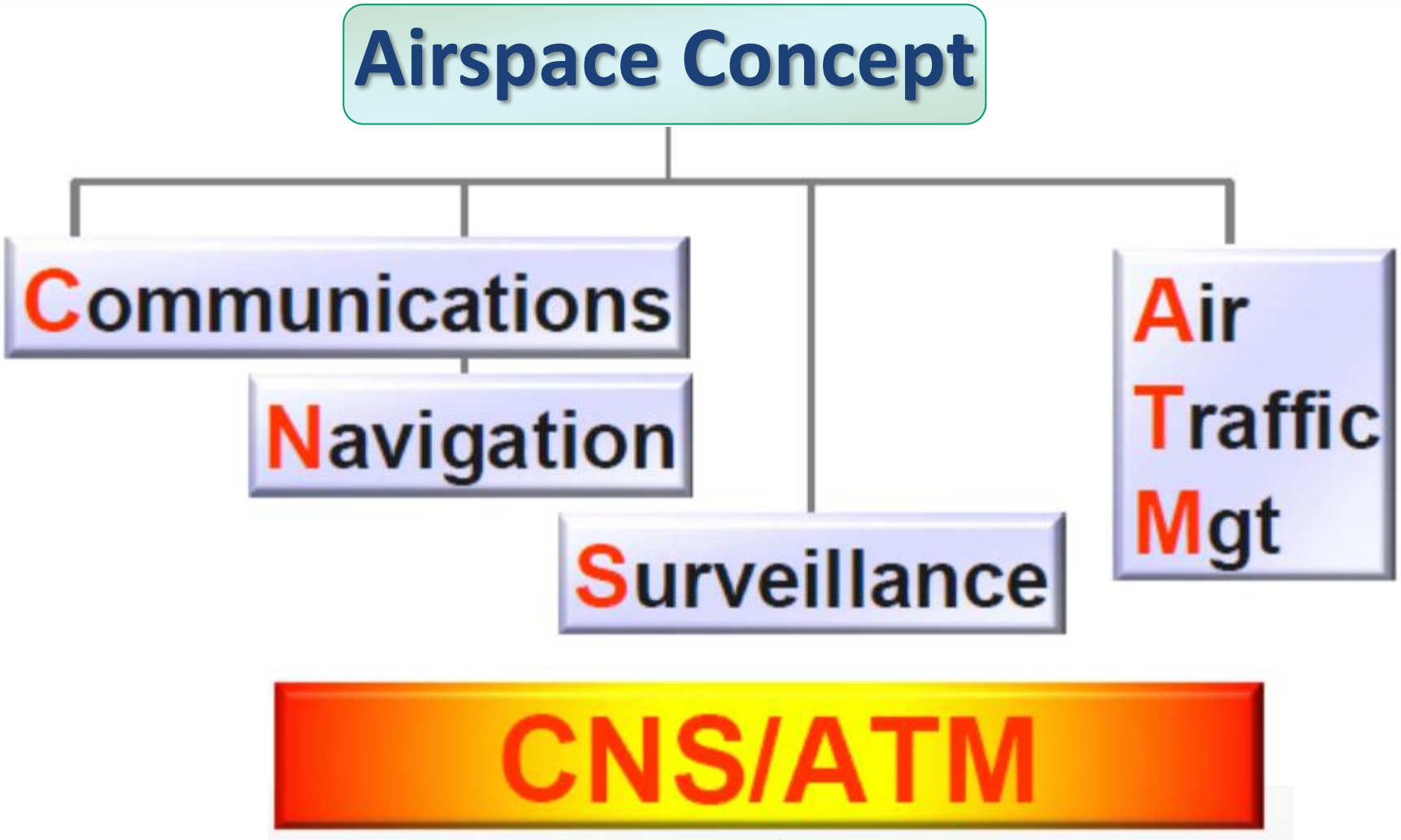
PBN Airspace Concept

COM | NAV | SUR | ATM



PBN Enables Airspace Concepts

Navigation in Context



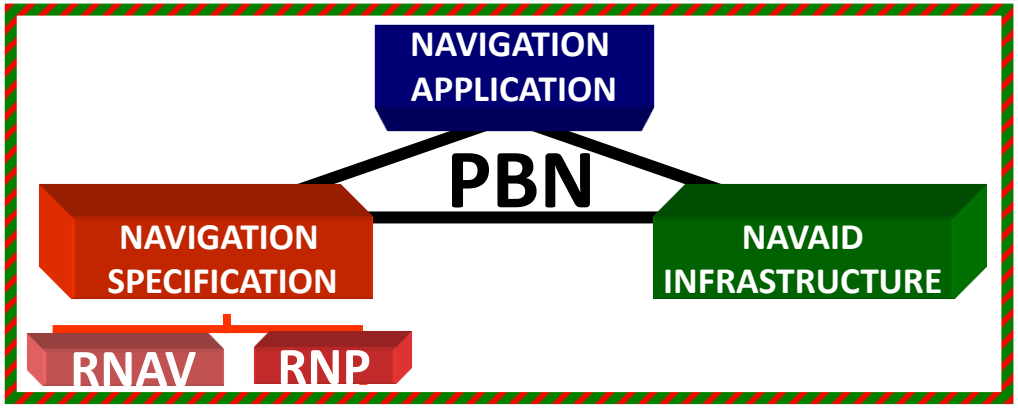
Context of an Airspace Concept

Strategic Goals (Expected Benefits)

Safety? | Capacity? | Efficiency? | Environment? | Access?

Airspace Concept

COM | **NAV** | **SUR** | **ATM**



New Airport

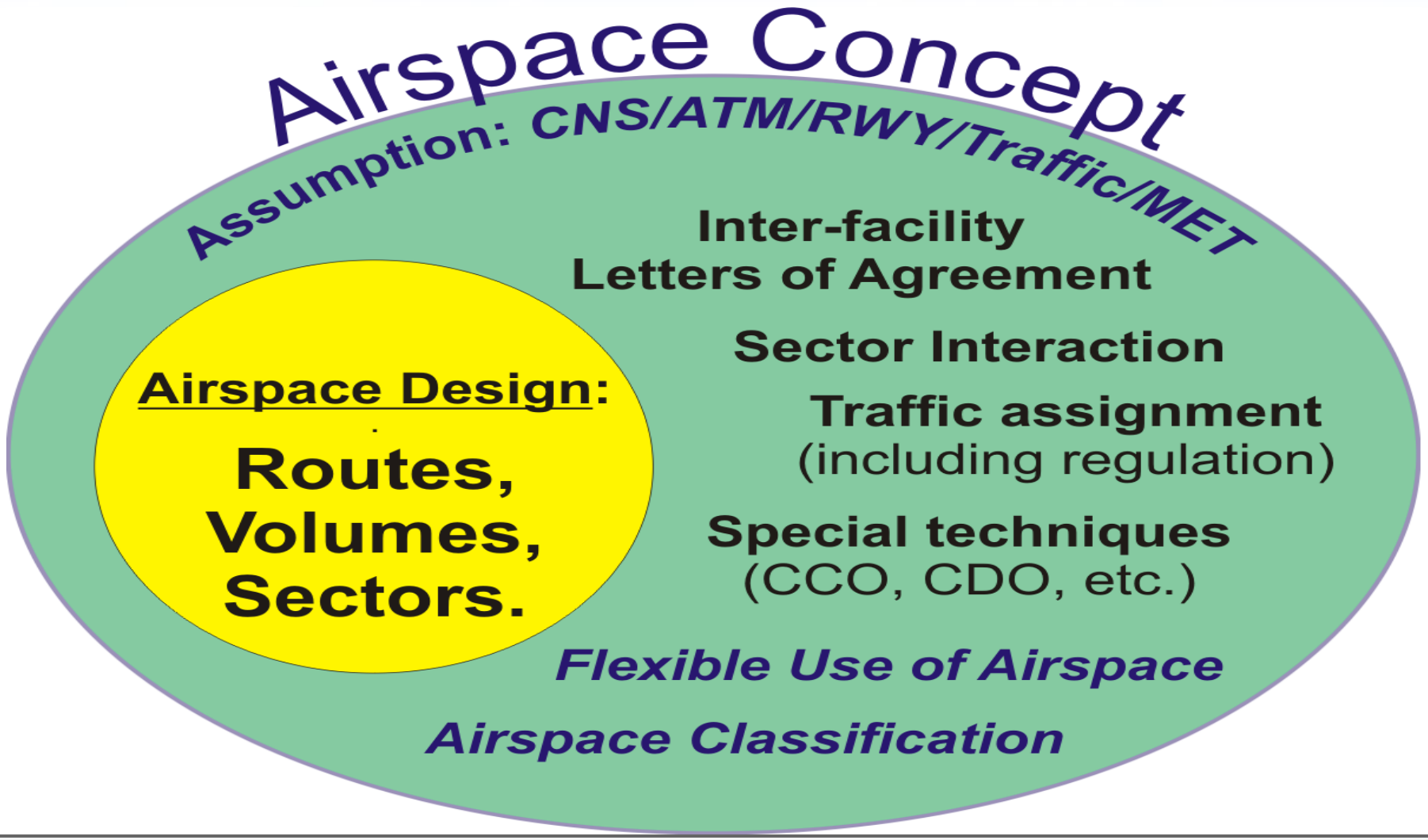
Context of an Airspace Concept

Safety	Capacity	Efficiency	Environment	Access
Operational Requirements				
Reduce Controlled Flight Into Terrain via lateral & vertical course guidance to runway	Increase number of air traffic routes to reduce congestion; accommodate projected growth	Reduce delays that result from excessive "levelling off" flight profiles by implementing CCO/CDO	Reduce noise over sensitive area	Improve airport and airspace access in all weather conditions
Implementation Objectives				
RNP approach (LNAV/VNAV) to replace circling approach	Parallel RNAV-2 ATS routes between cities	RNAV-1 SID that allows continuous climb to enroute	Use of RF in intermediate or missed approach segment	RNP approach allowing lower minima

What is an Airspace Concept

- **A master plan of the intended airspace design and its operation**
  - **Describes the intended operations within an airspace**
  - **Developed to satisfy explicit and implicit strategic objectives** (improved safety, increased air traffic capacity, improved flight efficiency, mitigation of environmental impact)
- **A fully developed Airspace Concept:**
  - **Describes in detail the airspace organization and its operations**
  - **Addresses all the strategic objectives identified for the project**
  - **Addresses all CNS/ATM enablers**
  - **Identifies all operational and technical assumptions**

Airspace Concept Constituents

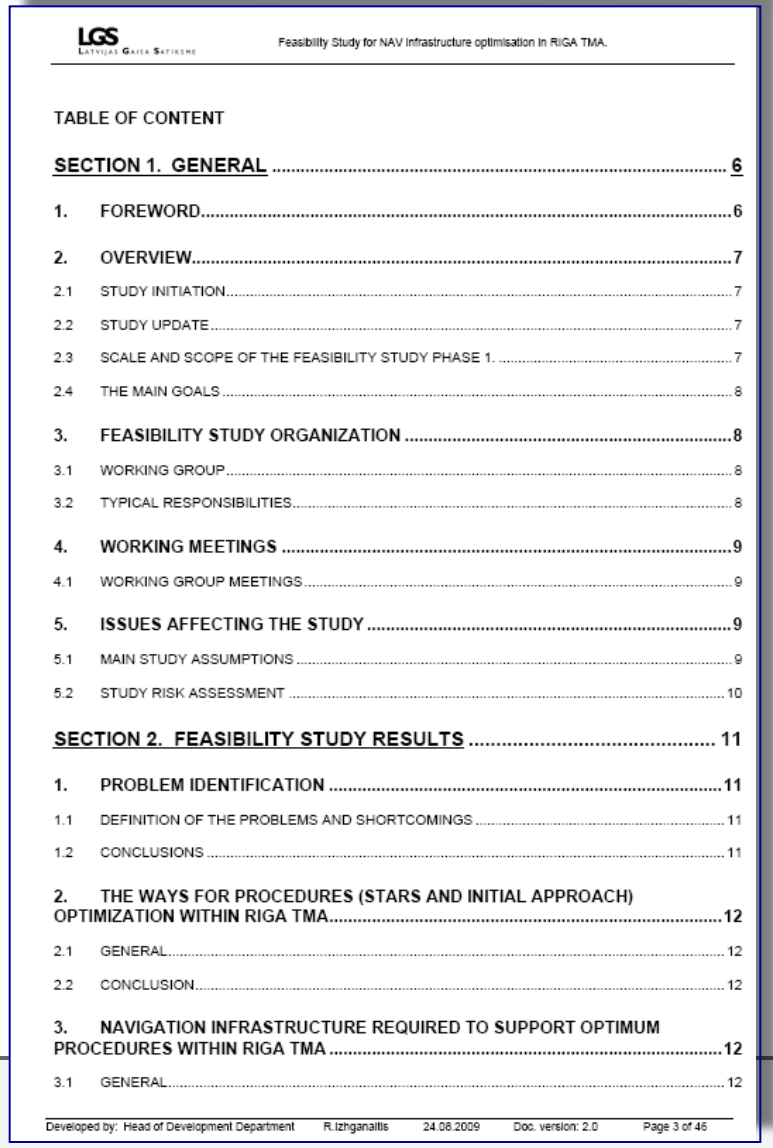


Why Develop an Airspace Concept

- Airspace Concept development provides a structured and systematic way of determining
  - What is to be achieved in an airspace, and
  - How it will be achieved
- The development process helps ensure
  - Goals (expected benefits) of planned airspace structure are clearly stated;
  - Objectives of the airspace change are met; and
  - The means to achieve these goals are appropriate and feasible within the resources available to the airspace system

What Does It Look Like?

- An Airspace Concept can be in any document format
- Maintain configuration control!

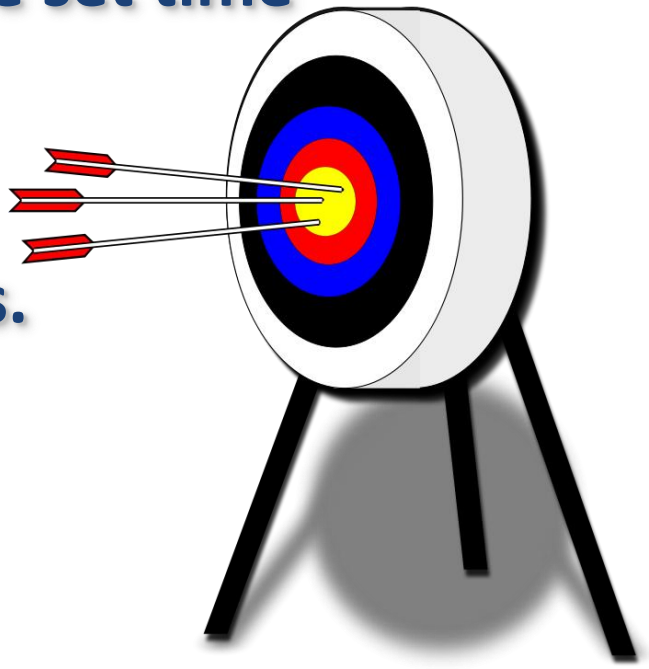


LGS Latvijas Gaisa Satiksme — Feasibility Study for NAV Infrastructure optimisation in RIGA TMA.

TABLE OF CONTENT

What is the Most Critical Point ?

- ❖ Setting the appropriate objectives and scope
- ➢ Enables the project team to remain focused and the budget to be managed within the set time
- ➢ Most projects which fail to meet the intended goal do so because of poorly defined scope and objectives.
- ➢ Beware of project creep!



Who develops an Airspace Concept?

- A *team effort* by representatives of various organizations and technical specialties
- Particular composition of the team depends on the scale and nature of the project
  - A simple airspace concept (e.g. a SID, STAR and IAP) would have experts from
    - ANSP (including PANS OPS procedure designer)
    - civil aviation regulator
    - airport operator
    - operators' representative

Who develops an Airspace Concept?

- A more extensive Airspace Concept (e.g. new runway, plan for terminal and enroute airspace) could also include
  - safety management system experts
  - simulation studies experts
  - additional operator representatives
  - environmental personnel

- Team lead - usually an airspace planner or knowledgeable ANSP air traffic manager
  - Not a hard and fast rule. The fundamental requirement is for:
    - A knowledgeable, proactive and dedicated individual
    - a sound understanding of ATM & airspace organization
    - appropriate and sustained support from participating agencies

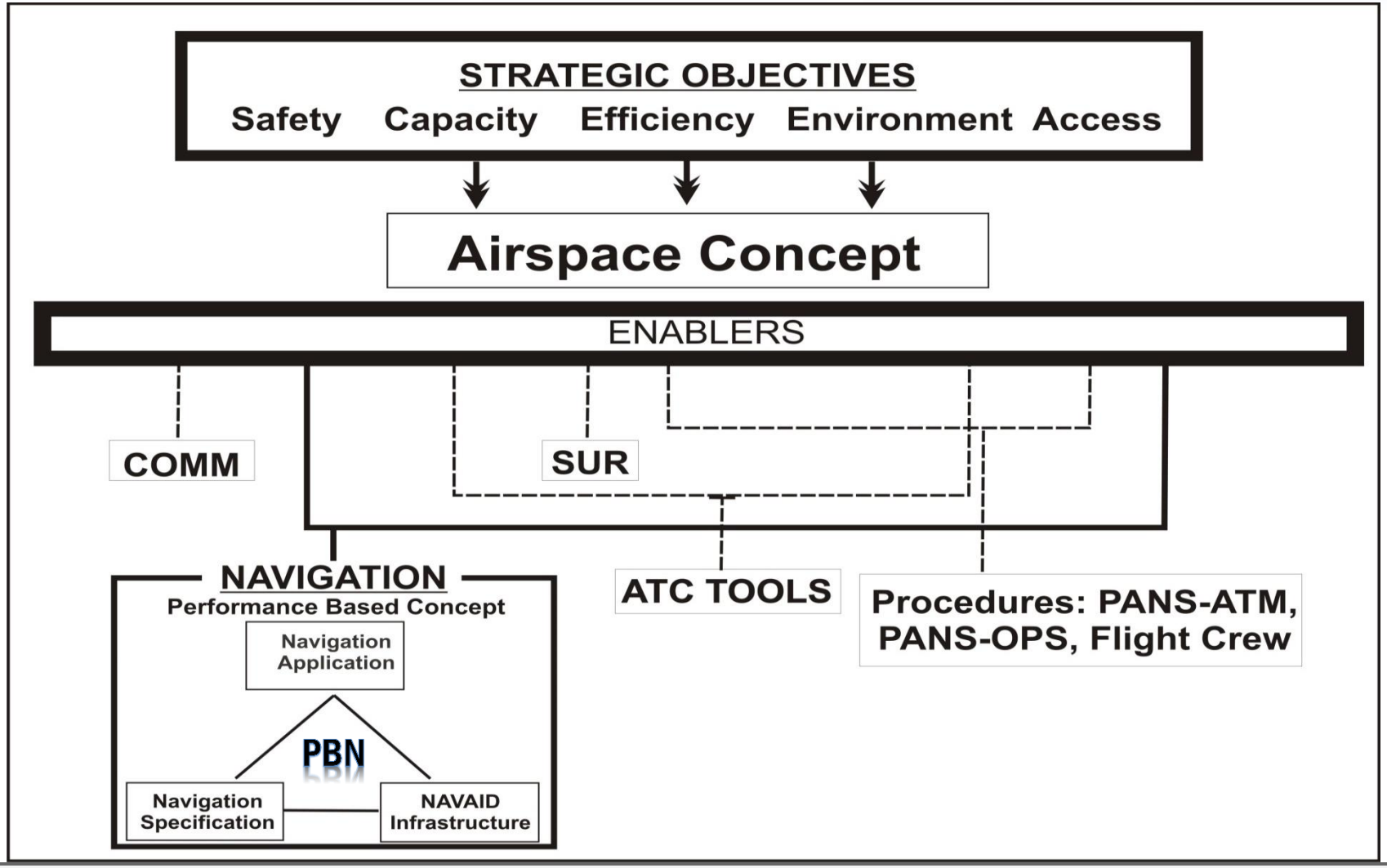
What does the team need to develop an Airspace Concept?

- TIME – to explore the needs of the various stakeholders, reach agreement on goals, identify current ground and airborne equipment limitations, conduct traffic flow analyses, etc
- MONEY – Costs may include (but are not limited to)
  - education and training (regulators, operators, ATC, procedure designers, etc),
  - establishment and sustainment of robust airworthiness, operations approvals, data quality techniques,
  - changes to ATC automation, flight validation, possibly new NAVAIDS (DMEs), etc
- TOOLS - design and modeling tools to support the design, validation and assessment of the present ("reference scenario") and planned Airspace Concept

Once the Airspace Concept is developed, what's next?

- Lay out a detailed program plan for the specific implementation(s) in the Airspace Concept
  - Consider just as a starting point
  - Adapt as needed to the specific circumstances of a project
  - Steps not always conducted in strict sequence
  - Certain steps may be conducted on a recurring basis as the project progresses
  - Steps and the sequence in which they are performed in the project should be evaluated by the implementation team on the basis of experience and judgment

Airspace Concept Summary

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Thank You