Transition Strategies to facilitate the gradual implementation of the Operational Concept

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Transition

We know were we are today and were we want to go.

We are now looking for the best road.

Transition = determining and following the road to the Operational Concept

Who are “WE”?

ATM Community Members
Different business perspectives

Art of Transition = to ensure that all Community Members follow the same Road

“balanced expectation of users”

Questions

- What are the objectives/drivers for transition?
- What is the approach for transition?
- How to follow the approach in practice?
- What are possible transition steps?

Transition
Objectives and drivers

Driver = Performance

- Safety
- Cost effectiveness
- Capacity
- Environment
- Efficiency
- Security
- Etc.

The ATM system is not perfect that's why we can and should improve.

Objectives of transition planning:

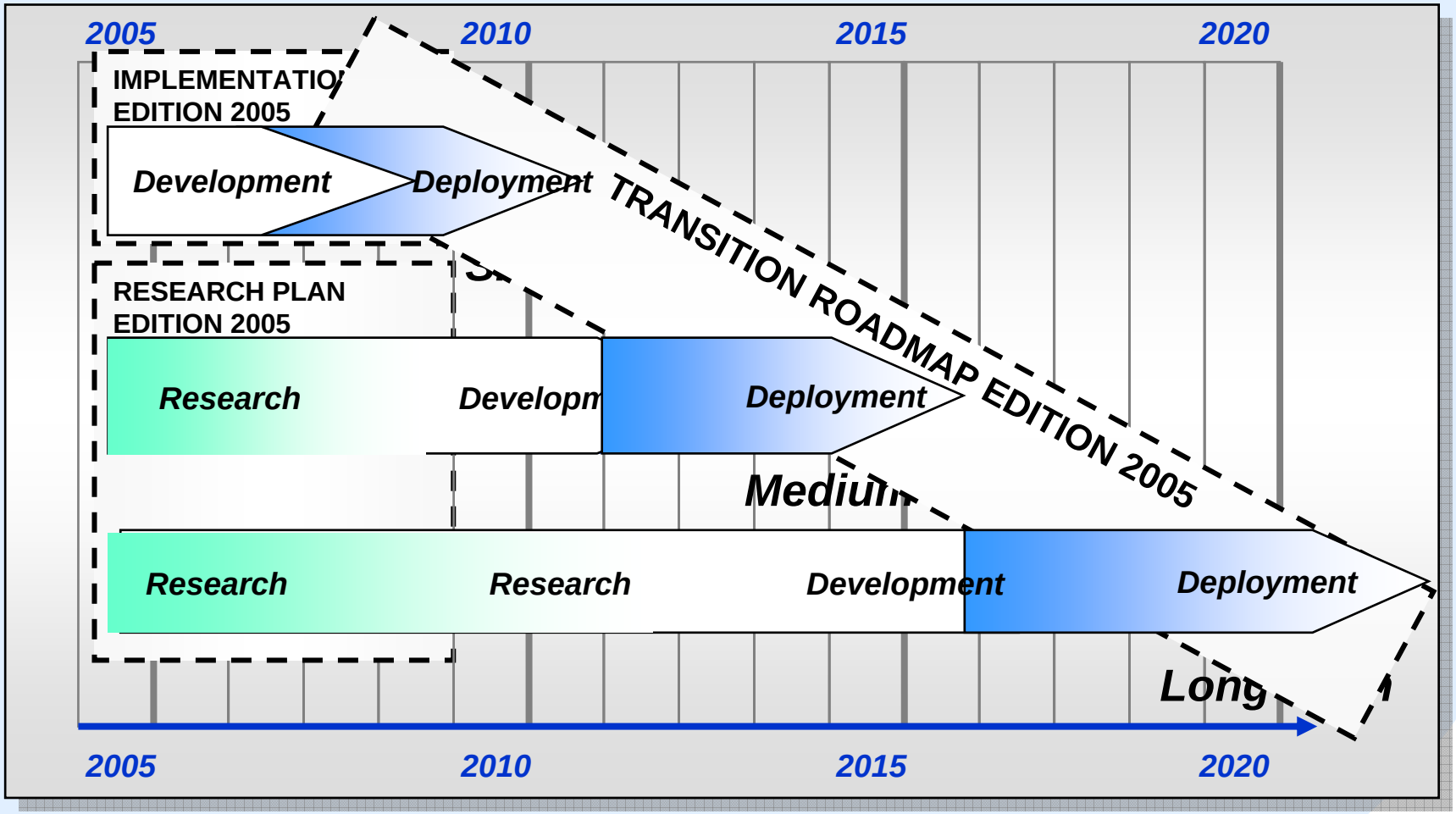
- To satisfy performance needs *Just in time*.
  - Too early: costs without return (benefits)
  - Too late: costs due to low performance
- To satisfy performance needs at minimal costs.
  - Select between options (*navigate the roads*)
- To ensure buy-in of community members
  - Address their perspectives
  - Transparency
  - Traceability

Deciding on the road to follow is Collaborate Decision Making

The Transition Approach

Transition approach = steps to be taken to determine the Transition Roadmap

Planning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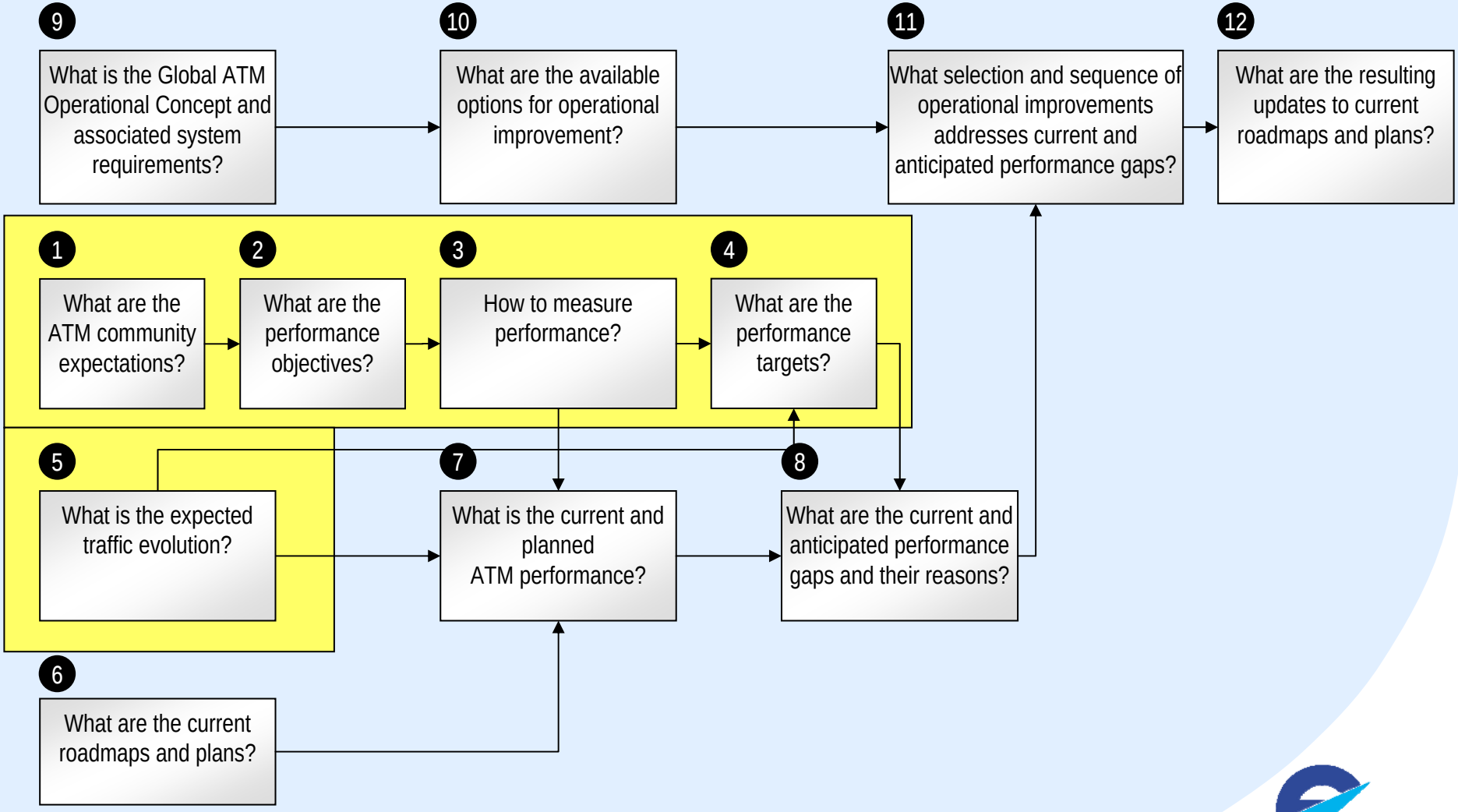
Performance Based Transition Process



Set Performance Targets: step 1: community expectations

- High level
- Qualitative
  - !! Room for interpretation and specification
- Often address interdependencies
- Scope = Air Transport

Community expectations need to be translated into ATM Performance Objectives

Set Performance Targets: step 1: community expectations (examples)

- Aviation should be safe
- Air travel should be with minimal delays
- Air travel should be environmentally friendly
- Air travel should have a sufficiently high level of security

Set Performance Targets: step 2: Objectives

- Expectations will be met by one or more Performance Objective(s).
- Desired/required trend for a performance indicator.
- Qualitative.
- SMART
  - Specific
  - Measurable
  - Achievable
  - Relevant
  - Timely
- To be agreed between community members.

Set Performance Targets: step 2: Objectives (examples)

- Aviation should be safe
  - Further improve ATM safety whilst accommodating air traffic growth
  - Reduce the number of ATM induced accidents per flight hour.
- Air travel should be with minimal delays
  - Reduce average en-route ATFM delay per flight during the summer ATC season
- Air travel should be environmentally friendly
  - Reduce aircraft noise and emissions levels
  - Proportionate reduction in CO2

Set Performance Targets: step 3: Define how to measure performance

- Define Performance Indicators
  - Used to set quantified target for performance objectives
  - Used to quantify the achievement of performance objectives
- To be agreed between community members
- Need for standardisation
  - Consistency
  - Transparency

Set Performance Targets: step 3: Define how to measure performance (**examples**)

- Aviation should be safe
  - Further improve ATM safety whilst accommodating air traffic growth
  - Reduce the number of ATM induced accidents per flight hour.
    - Number of ATM-induced accidents per flight hour
- Air travel should be with minimal delays
  - Reduce average en-route ATFM delay per flight during the summer ATC season
    - Average annual en-route delay per flight during the Summer ATC season
- Air travel should be environmentally friendly
  - Reduce aircraft noise and emissions levels
  - Proportionate reduction in CO2
    - Annual average CO2 kg per distance/productivity unit

Set Performance Targets: step 4: Agree and set performance targets

- Targets are set using performance indicators
- Targets are quantitative and scoped:
  - Time dimension
  - Geographical dimension
- Not arbitrary
  - Can be based on traffic forecast
  - Knowledge on performance of baseline (current system)
  - Learning from neighbours
  - Benchmarking
- Collaborative decision making

Set Performance Targets: step 4: Agree and set performance targets (examples)

- Aviation should be safe
  - Further improve ATM safety whilst accommodating air traffic growth
  - Reduce the number of ATM induced accidents per flight hour.
    - Number of ATM-induced accidents per flight hour
      - Less than $1{,}55.\ 10^{-8}$ to be achieved by 2015 (based on Forecast)
- Air travel should be with minimal delays
  - Reduce average en-route ATFM delay per flight during the summer ATC season
    - Average annual en-route delay per flight during the Summer ATC season
      - 1 minute to be achieved by 2006 (is translated to capacity target using forecast)

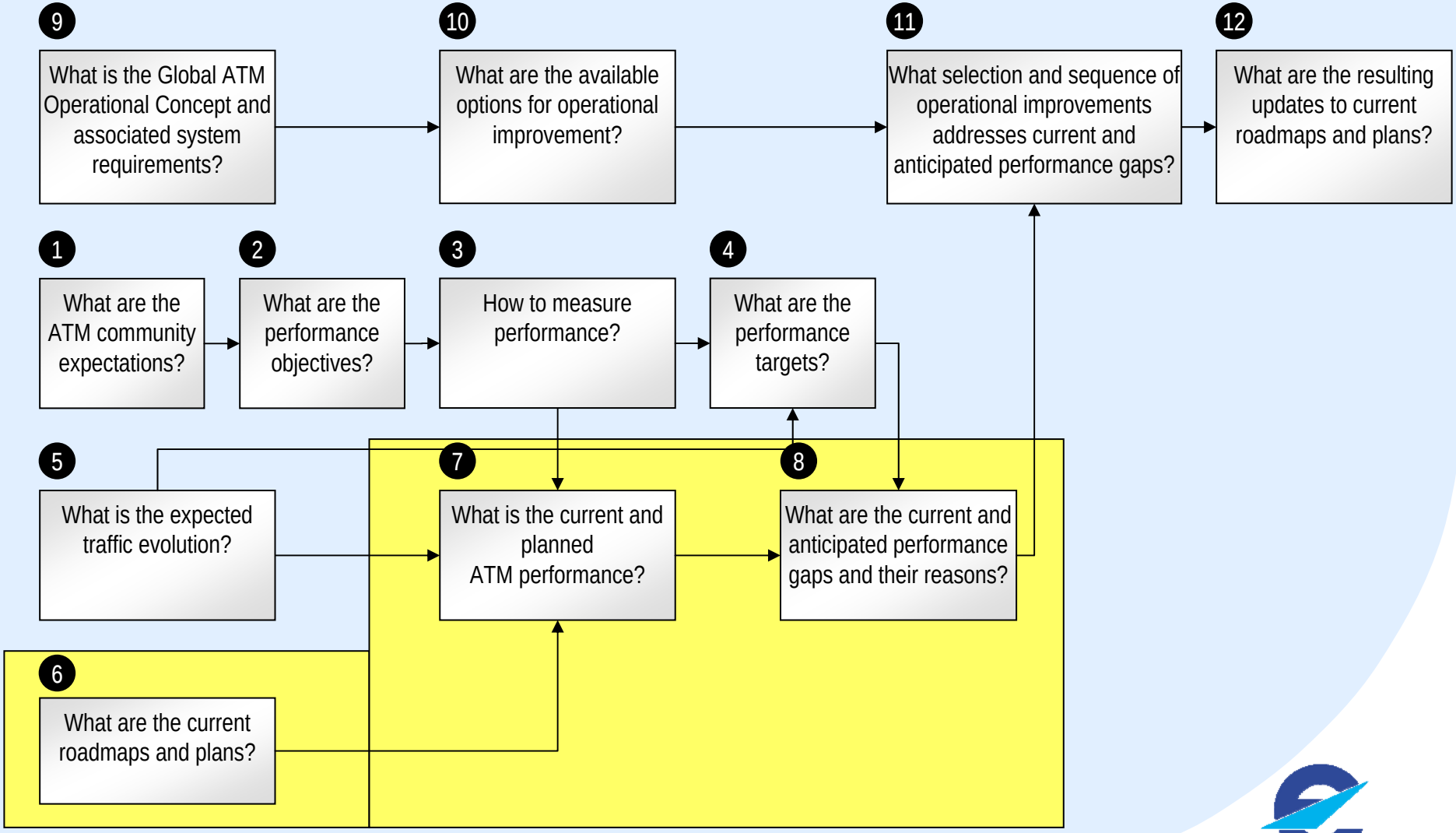
Set Performance Targets: step 5: Forecast

- WHY?
  - shared and consistent understanding of the future = basis and starting point for CDM
  - Input for performance targets
- WHAT needs to be forecasted?
  - Information necessary for performance based transition
    - E.g. Nbr of flights
    - E.g. Nbr. of Km/NM controlled or flown
    - Revenue Pax Kilometers (RPK) is of less value for ATM performance planning
    - E.g. Nbr. Of Km/NM flown per engine type
- Types of Forecast?
  - Short term: 1 year
    - Used for resource planning
  - Medium term: up to 5 – 7 years
    - Used for resource and short term deployment planning
  - Long term: up to 20 years
    - Used for strategic performance based transition

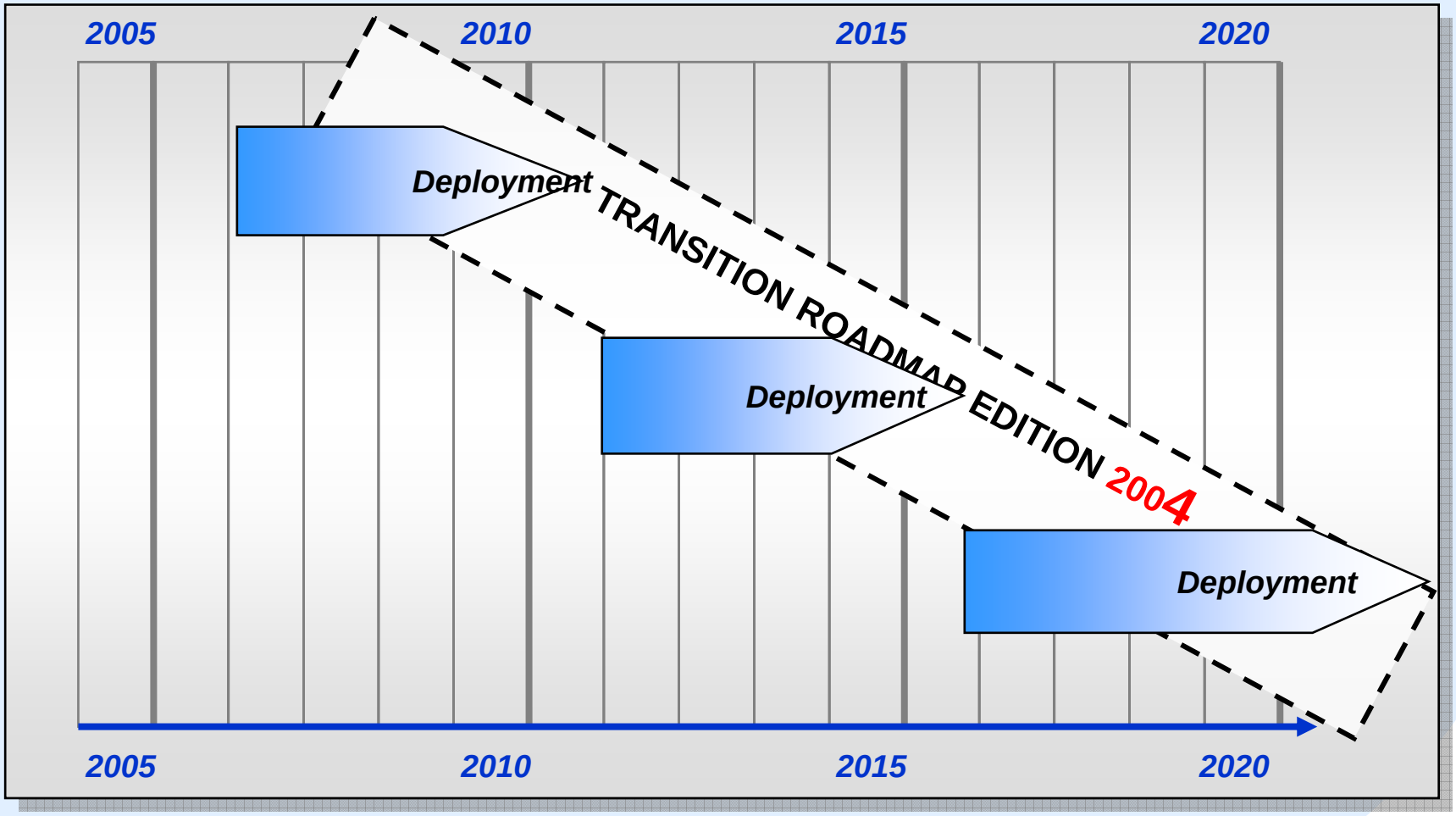
Set Performance Targets: step 5: (Long Term) Forecast

- Starting point: scenarios
  - Describing influencial factors e.g.
    - Oil price
    - Price of travel
    - GDP growth
    - Tourism development
  - Representing consistent possible futures
- Econometric modeling
  - Based on statistical evidence
- Iterative and collaborative

Performance Based Transition Process



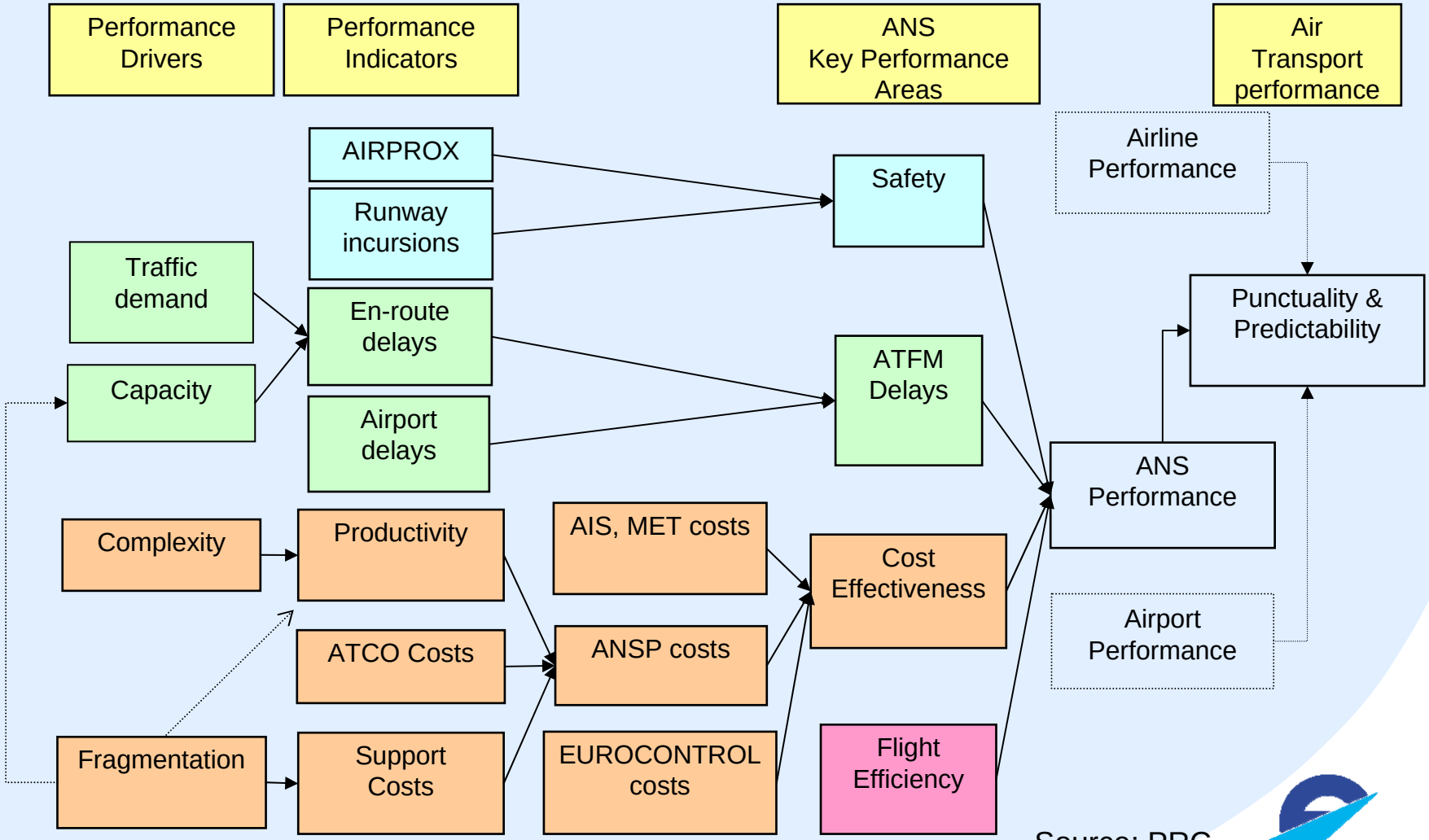
Performance and Gap Analysis step 6: current roadmaps and plans



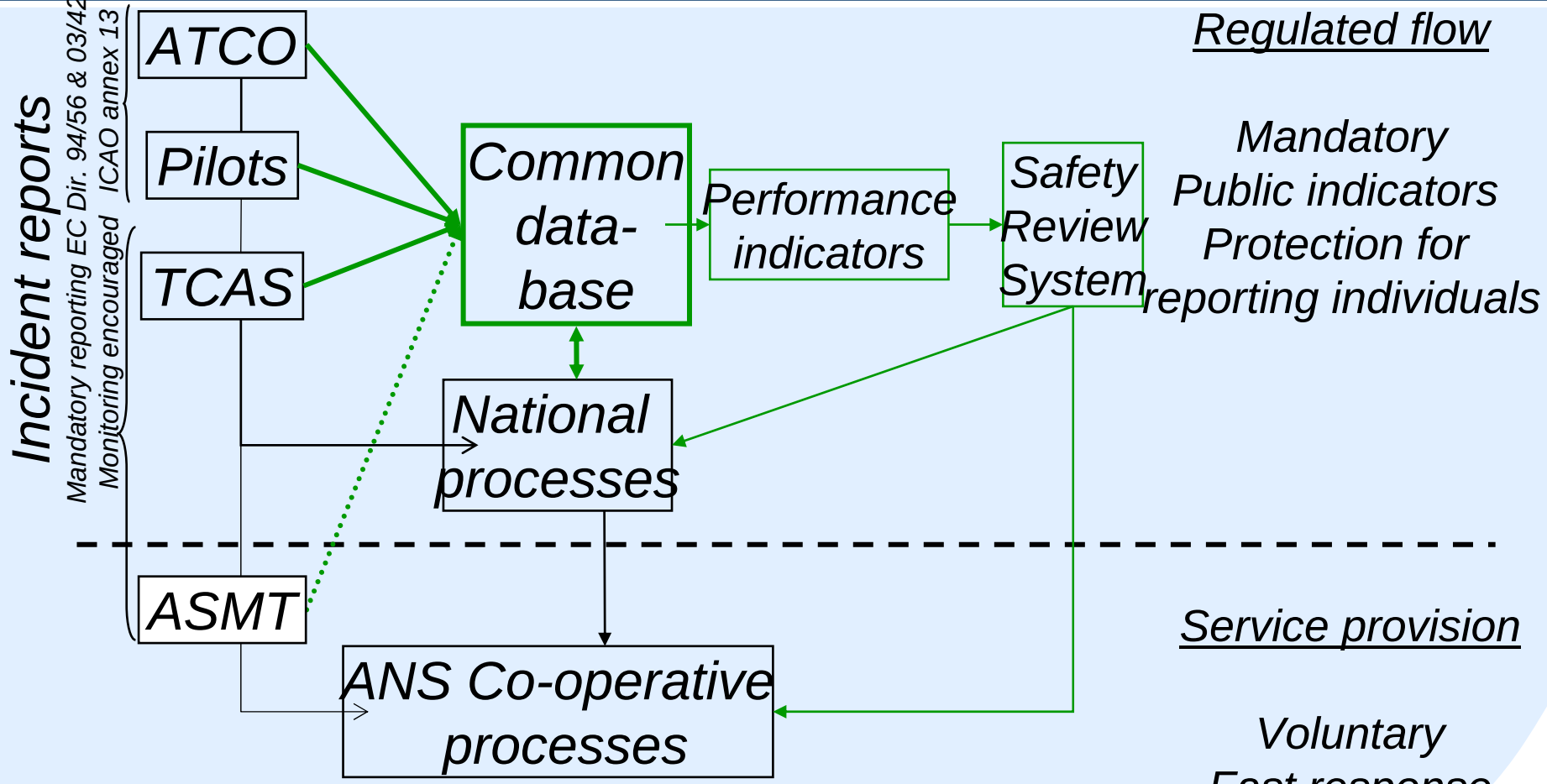
Performance and Gap Analysis: step 7: current and planned performance

- Current performance
  - Using performance review
  - Based on performance indicators
  - Trend analysis
  - Ideal: covers all performance areas
- Planned performance
  - Based on previously agreed improvements
  - Assessed through validation activities (R&D)
    - Objective of validation is to reduce uncertainties
    - Essential part of performance management
    - Validation methods
      - Analytical
      - Fast-time/Real-time simulations
      - Prototyping

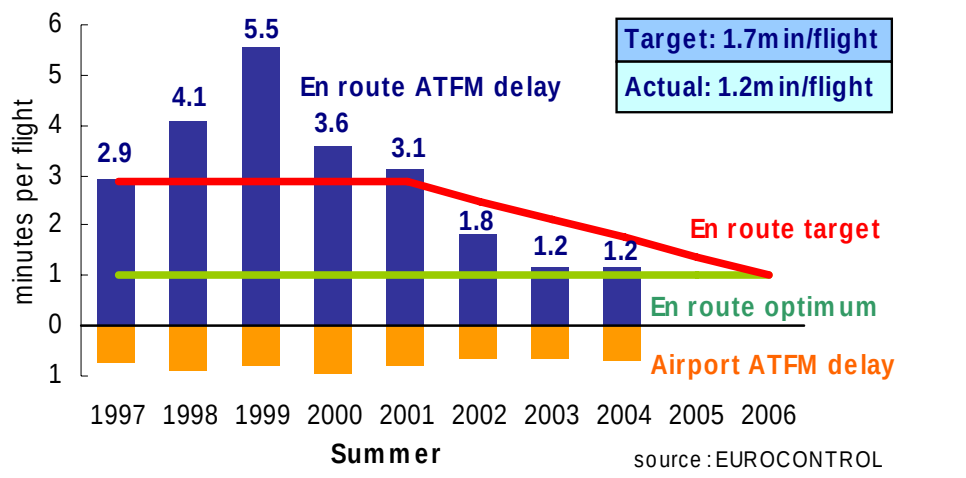
Performance and Gap Analysis: step 7: *current* and planned *performance (example of review approach)*

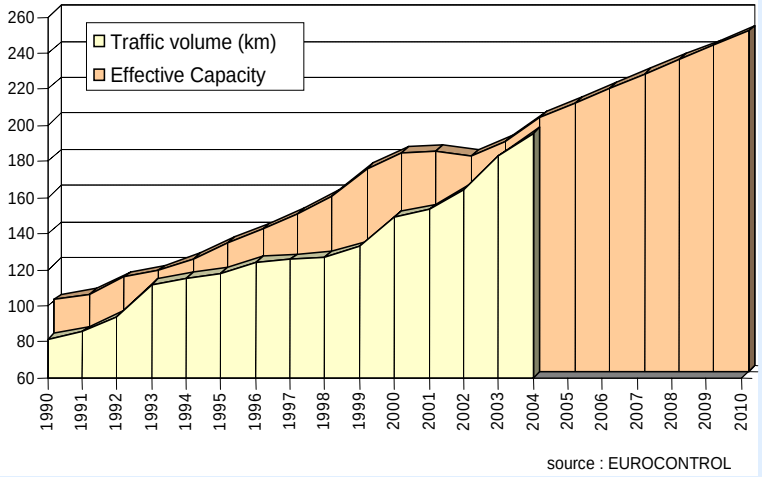


Proposed safety performance monitoring framework (source PRC)



Example of review results: ATFM delays target = 1 min by 2006 (source PRC)

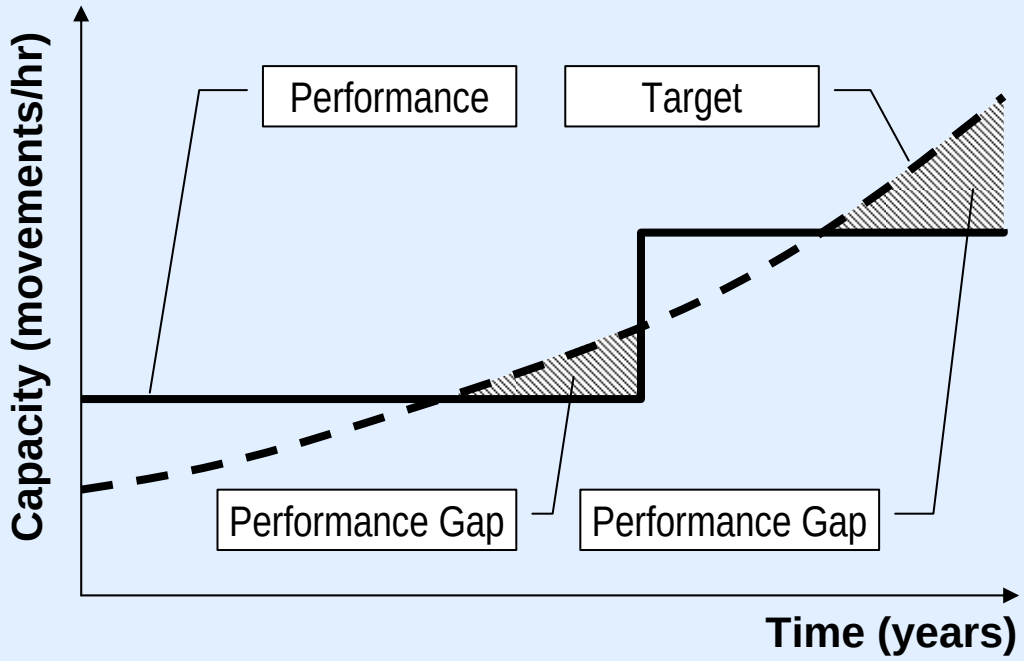




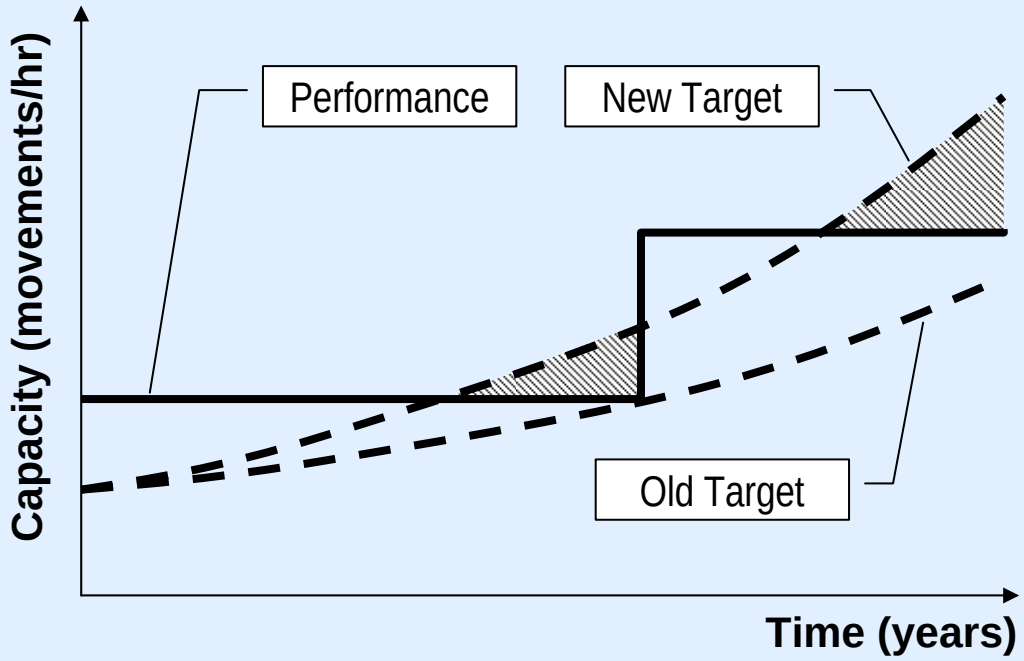
4. Major progress has been achieved in reducing European ATM-related delays. However, resolute action is needed to meet the rapidly growing demand.

   - Better of use of existing or latent capacity should be sought everywhere, especially where productivity is low, would improve both level of service and cost-effectiveness
   - Additional capacity should be created where necessary through co-ordinated individual and Europe-wide actions
   - A few "hard bottlenecks" are expected to appear in core Europe. This will require specific solutions to satisfy both civil and military needs.

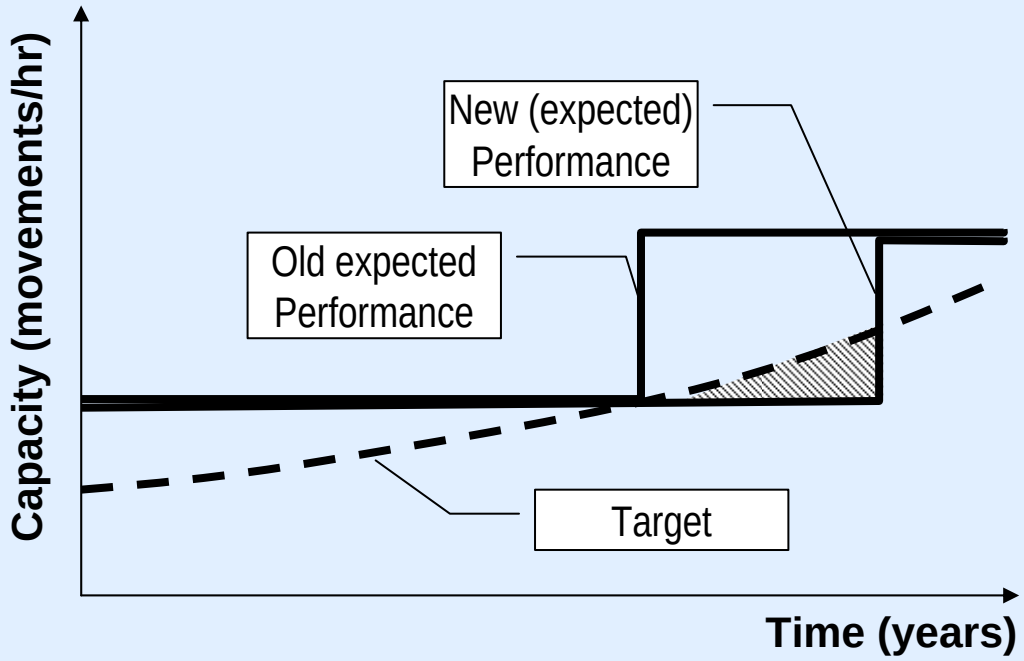
Performance and Gap Analysis: step 8: Gap analysis



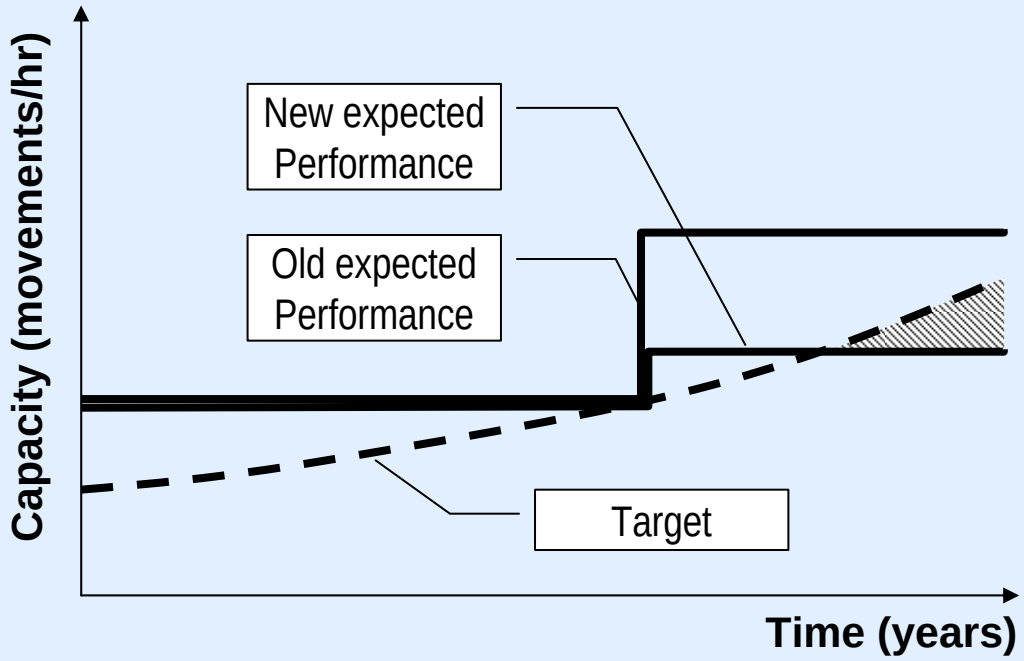
Performance and Gap Analysis: step 8: Gap analysis – causes of gaps (1)



Performance and Gap Analysis: step 8: Gap analysis – causes of gaps (2)



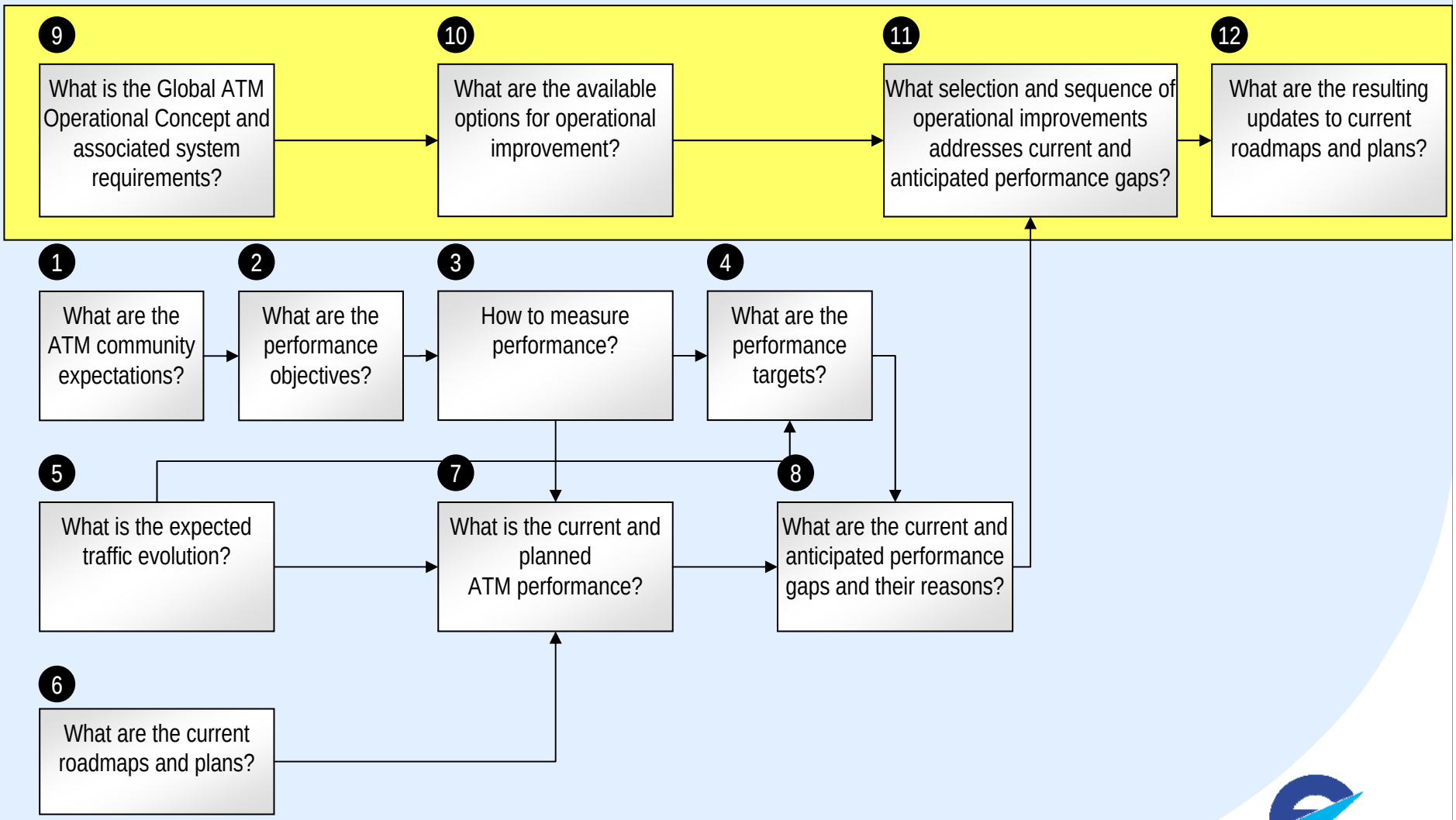
Performance and Gap Analysis: step 8: Gap analysis – causes of gaps (3)



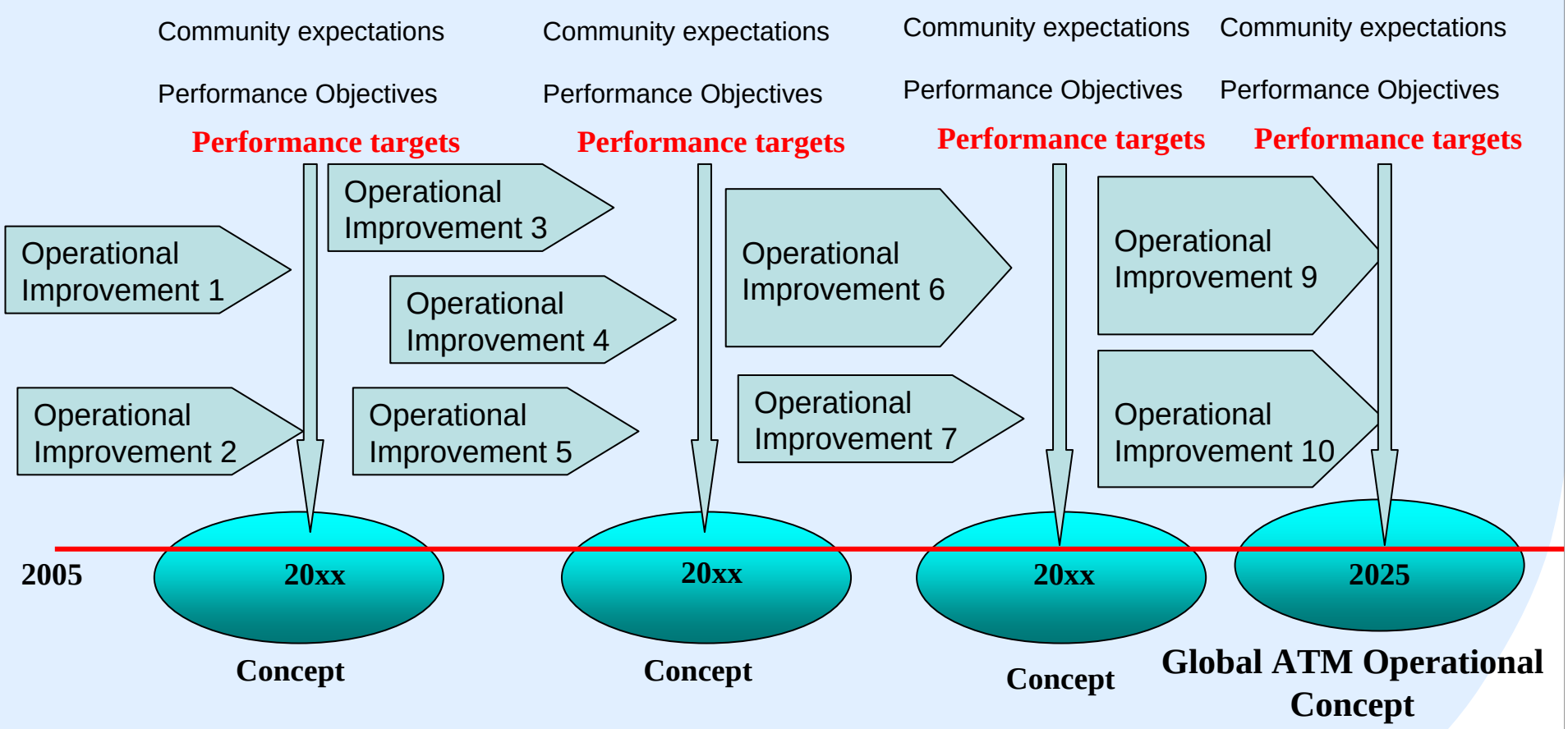
Performance and Gap Analysis: step 8: Gap analysis performance constraints

- Why can the system not deliver the target performance?
- Many perspectives
  - Airspace
  - ATC
  - Airports
- Many interactions
  - Airspace users and ATC
  - Airports and ATC
  - ATC and ATFM
  - Humans and technical systems
  - Between operations
- Requires an ATM performance influence model

Performance Based Transition Process



Operational Improvements:
Changes to the ATM system to deliver performance improvements



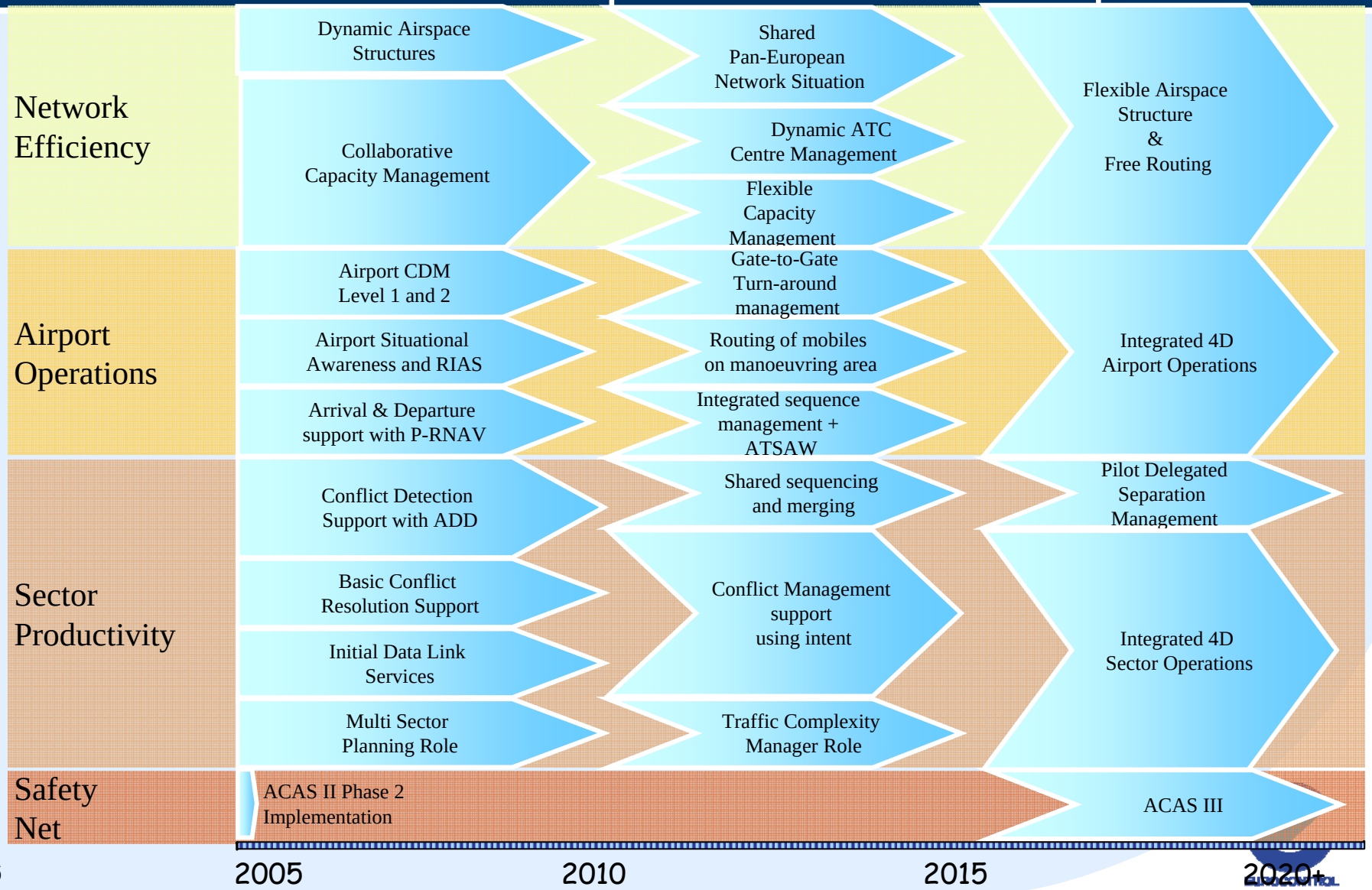
Update transition roadmap: step 10: what are available Operational Improvements?

- Driver: analysis of the performance gaps
- Focus: Operational Concept
- Reference: Baseline
  - Performance
  - Operational
  - Technical
- Options:
  - Accelerate/change Operational Improvements in current roadmap
  - Introduce Operational Improvements with a proven track record
    - Best practices
  - Introduce new Operational Improvements
    - Inputs through innovative results

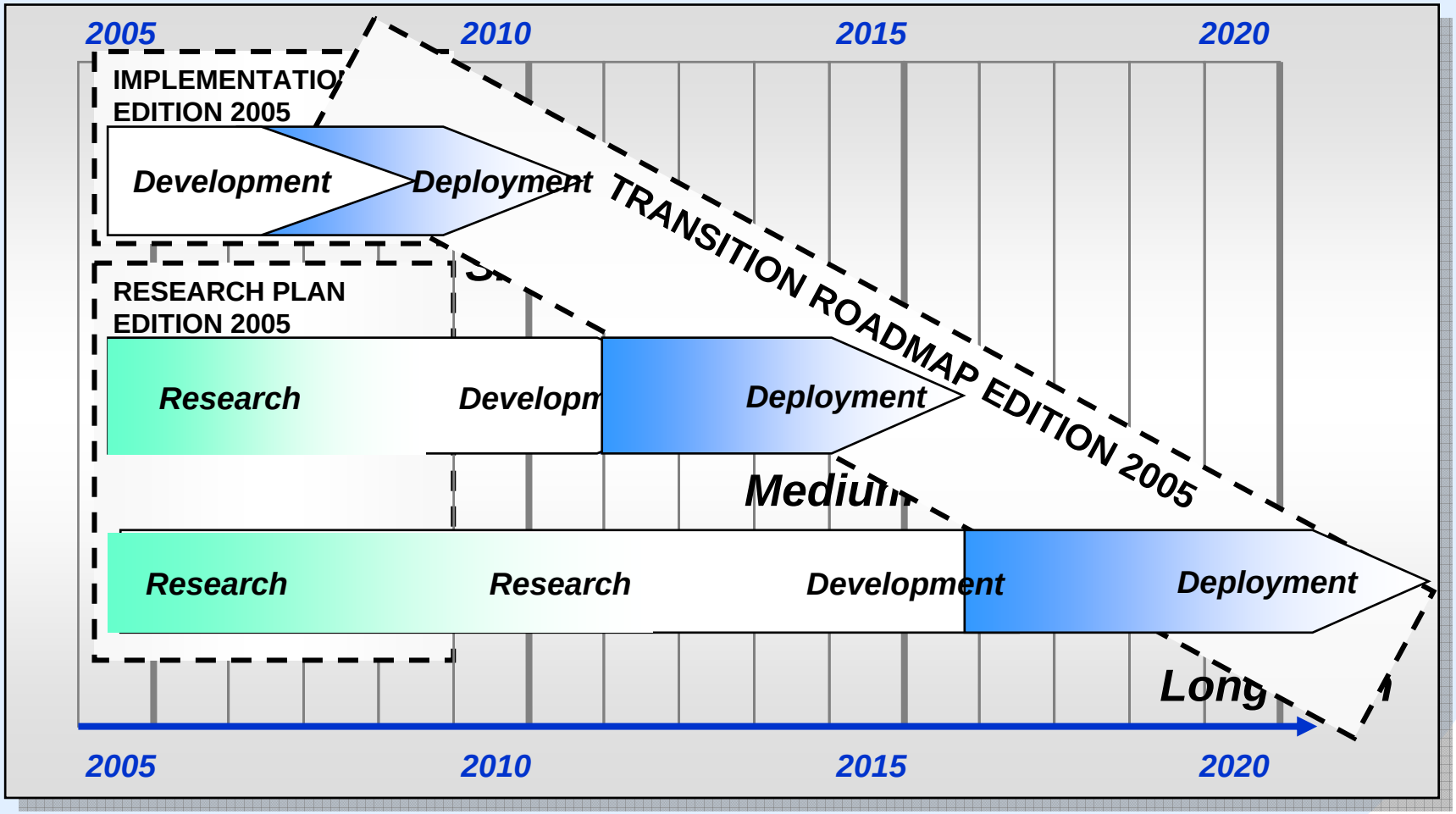
Update transition roadmap: step 11: selection and sequence of Operational Improvements

- Selection
  - Need for analysis of Operational Improvement
    - Performance mechanism: *how does the OI deliver benefits?*
    - Enablers
    - Costs
    - Timing
    - Etc.
  - Scope of deployment
  - Deployment strategy
  - Collaborative Decision Making
    - Business Case/trade-off
    - Essential: need for buy-in
- Sequence
  - Resource planning
  - Baseline
  - Common enablers

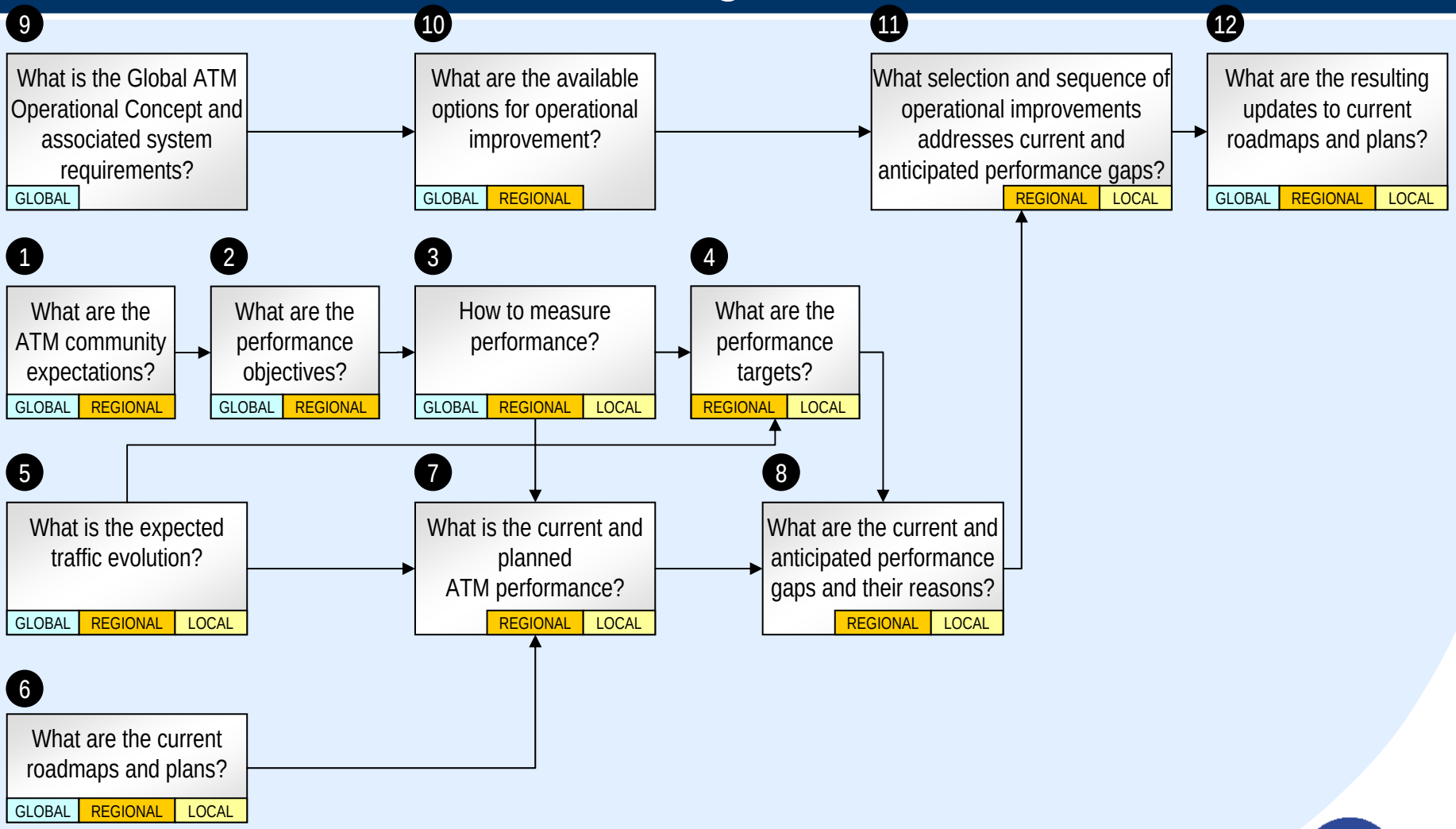
Update transition roadmap: step 11: selection and sequence of Operational Improvements –example roadmap



Update transition roadmap: step 12: update current roadmap and plans



PERFORMANCE BASED TRANSITION APPROACH
Global – Regional - Local



Questions addressed

- What are the objectives/drivers for transition?
- What is the approach for transition?
- How to follow the approach in practice?
- What are possible transition steps?

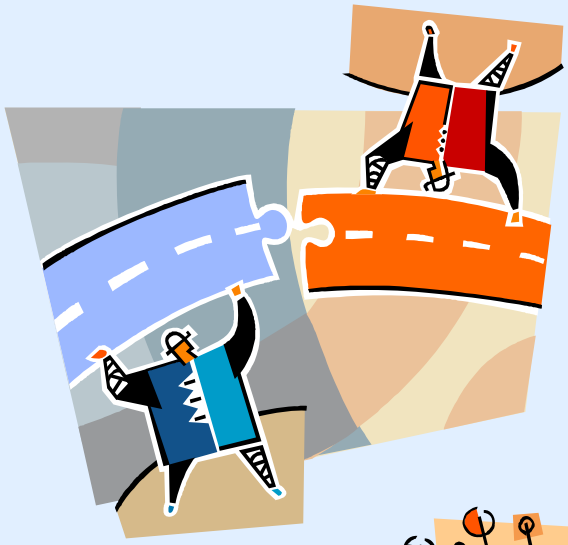
Overview/conclusions

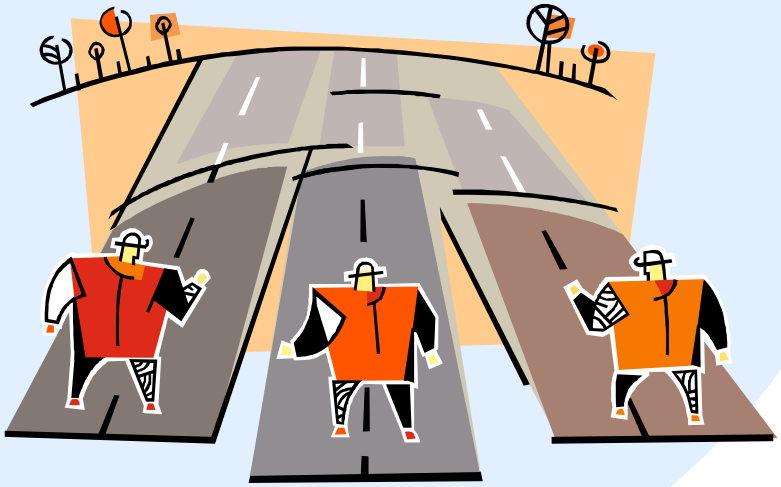
- Transition to the Global ATM Operational Concept:
  - can and should start “today”
  - is performance driven
- Performance based Transition requires
  - A structured approach
  - Performance review: knowledge of the performance today
  - Focused validation: understanding of the performance of the Operational Improvements
- Above all: Performance based Transition should use Collaborative Decision Making

For more information

http://www.eurocontrol.int

There are many roads
We only need to find and follow them *together*





Thank you

QUESTIONS?