

ELEVENTH AIR NAVIGATION CONFERENCE

Montreal, 22 September to 3 October 2003

Agenda Item 3: Air traffic management (ATM) performance targets for safety, efficiency and regularity and the role of required total system performance (RTSP) in this respect

3.1 Performance targets for ATM
:

ECONOMIC PERFORMANCE OF ATM

(Presented by the European Organisation for the Safety of Air Navigation — EUROCONTROL, on behalf of its Member States and those of ECAC)¹

SUMMARY

This paper describes progress being made within EUROCONTROL on the analysis of economic performance of Air Traffic Management in Europe.

The paper recommends that ICAO assess the need for world-wide standardization of minimum reporting requirements, considering as a basis the Specification for Information Disclosure adopted in EUROCONTROL.

Action by the conference is in paragraph 6.

REFERENCES

* English, French, Russian and Spanish versions provided by Eurocontrol.

¹ The ECAC Member States are: **Albania**, Armenia, **Austria**, Azerbaijan, **Belgium**, Bosnia and Herzegovina, **Bulgaria**, **Croatia**, **Cyprus**, **the Czech Republic**, **Denmark**, Estonia, **Finland**, **France**, **Germany**, **Greece**, **Hungary**, Iceland, **Ireland**, **Italy**, Latvia, Lithuania, **Luxembourg**, **Malta**, **Moldova**, **Monaco**, **the Netherlands**, **Norway**, Poland, **Portugal**, **Romania**, Serbia and Montenegro, **the Slovak Republic**, **Slovenia**, **Spain**, Sweden, Switzerland, **The former Yugoslav Republic of Macedonia**, **Turkey**, Ukraine and **the United Kingdom**).

The 31 Member States of EUROCONTROL appear in **bold**

1. EUROCONTROL, ATM 2000+ Strategy:
<http://www.eurocontrol.int/eatmp/library/strategydoc.html>
2. EUROCONTROL PRC, Performance Review Reports: <http://www.eurocontrol.int/prc>
3. EUROCONTROL PRC, Cost effectiveness and productivity KPIs:
<http://www.eurocontrol.be/prc/reports/kpi/documents/kpi.pdf>
4. EUROCONTROL, Specification for information disclosure, V2:
<http://www.eurocontrol.be/prc/reports/eco1/documents/eco1.pdf>
5. EUROCONTROL PRU, Progress towards Cost Benchmarking of the European ATM System: <http://www.eurocontrol.be/prc/reports/stu3/documents/stu3.pdf>

1. INTRODUCTION

1.1 The revised Convention of EUROCONTROL², seeks to improve air traffic management (ATM) performance by introducing in particular a strong, transparent and independent performance review system. The Performance Review Commission (PRC) was created in 1998, and the EUROCONTROL ATM 2000+ Strategy (ref. 1) was adopted in 2000.

1.2 Both the PRC in its Performance Review Reports (ref. 2) and the EUROCONTROL ATM 2000+ Strategy address several areas of ATM performance, including safety, delays, cost-effectiveness and flight efficiency.

1.3 This paper focuses on the cost-effectiveness aspect of ATM performance, which is of major economic significance. Some € 6,000 Million was paid by airspace users in route and terminal charges for the European ATM System in 2002. A 10% improvement in cost-effectiveness equals therefore, in Europe alone, to a potential saving of some € 600 Million a year.

1.4 The paper addresses three areas, where progress has been made in recent years:

- Methodology - including definitions and performance metrics;
- Data collection - information disclosure; and
- Benchmarking of Air Navigation Services Providers (ANSP).

² Article 2.1.i of the Revised Convention of EUROCONTROL states: [the Organisation shall] “establish an independent performance review system that will address all aspects of air traffic management, including policy and planning, safety management at and around airports and in the airspace, as well as financial and economic aspects of services rendered, and set targets that will address all those aspects.”

2. METHODOLOGY

2.1 The methodology for the cost-effectiveness analysis is described in the document “Cost-effectiveness and productivity KPIs” (ref. 3). This methodology has been validated with European Air Navigation Service Providers (ANSPs). It has been applied in Europe, and also in a performance comparison with the Federal Aviation Administration (FAA) of the United States.

2.2 The methodology considers inputs and associated costs, production (a proxy is sector-hours) and outputs (e.g. flight hours controlled), as shown in *Figure 1*. Cost-effectiveness is measured as cost per unit of output (e.g. cost per flight hour). Cost-effectiveness can be broken down into efficiency of production (cost per production unit) and efficiency of allocation (output per production unit). For example, if more sectors are opened than required, efficiency of allocation will decrease.

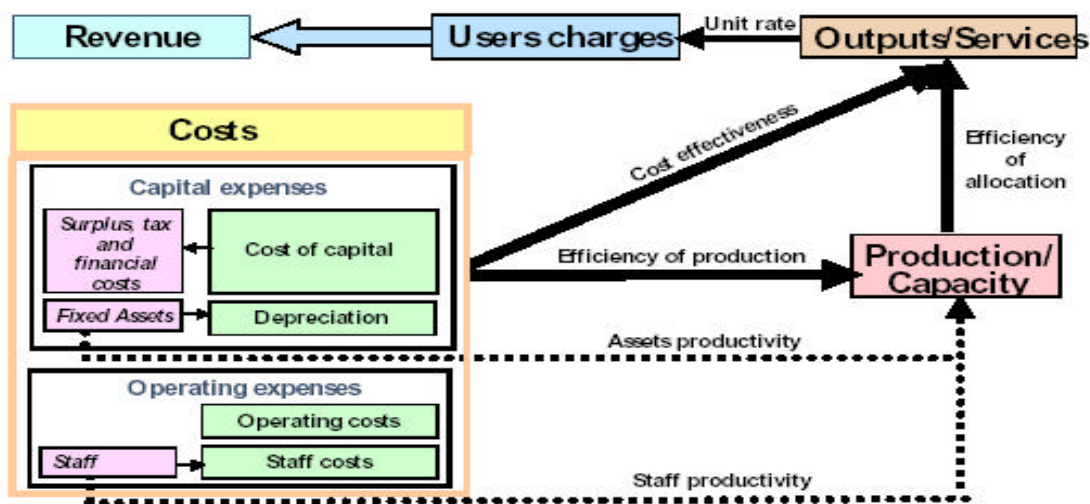


Figure 1. Cost-effectiveness framework

2.3 The Key Performance Indicator for cost-effectiveness (cost per flight-hour³) can be broken down further, as indicated in *Figure 2*.

³ Flight-hours have been found to be a useful output metric for en-route. Work in underway to define more comprehensive output metrics, e.g. for terminal Air Traffic Services.

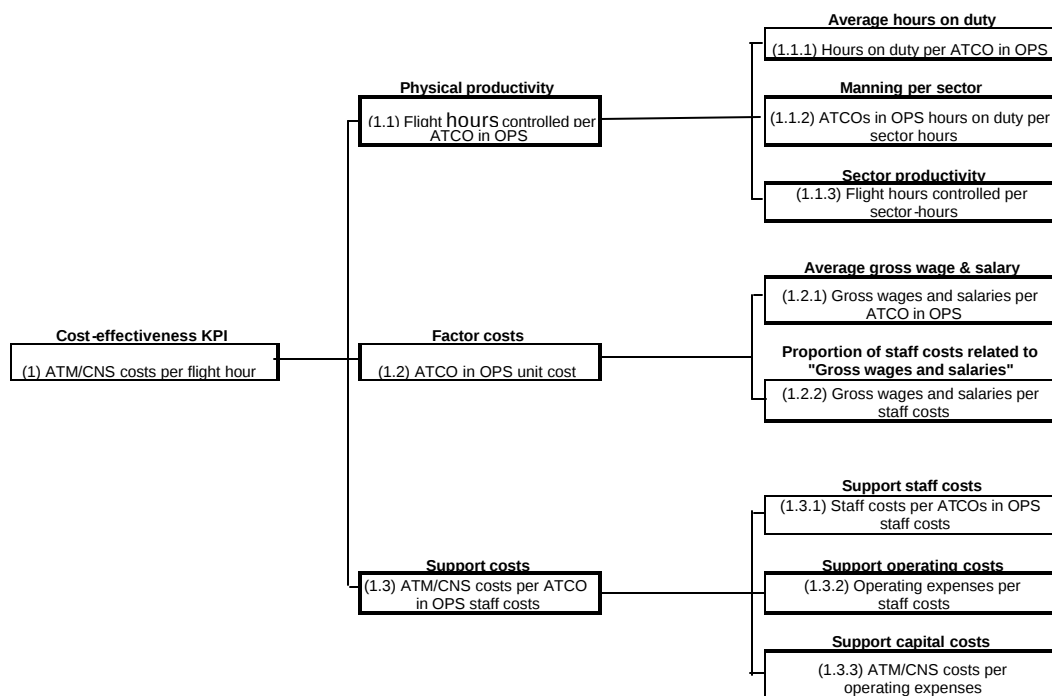


Figure 2. Cost-effectiveness indicators

3. INFORMATION DISCLOSURE

3.1 The availability of relevant, accurate and timely economic information is an essential prerequisite for the conduct of cost-effectiveness and productivity analysis with a view to improving ATM performance. Information disclosure should therefore be seen as a normal obligation imposed on a statutory monopoly as the counterpart of its monopoly rights. Information is required for effective consultation between users and ANSPs, and is necessary to ensure that parties have a common understanding of cost drivers and performance. Information disclosure has a direct benefit for ANSPs and their regulators: it provides essential management information and best practice can be identified and promoted using benchmarking. Moreover, information disclosure is an essential component of a performance review system to ensure the cost-effectiveness of air navigation services and to support target setting and performance processes.

3.2 ANSPs are required to provide the following information on a yearly basis to the PRC, in conformity with the “*Specification for Information Disclosure*” (ref. 4):

- a) separate accounts for their air traffic management activities, prepared in accordance with Generally Accepted Accounting Principles (GAAP) and independently audited;
- b) a limited separation of key revenue, cost and asset items into those for en-route and those for approach and airport activities, also independently audited; and
- c) information on the physical inputs used by the ANSP and the outputs/capacity produced.

3.3 The Specification for Information Disclosure includes detailed definitions, which have been validated with European ANSPs. Experience indicates that the Specification for Information Disclosure adopted by the EUROCONTROL Member States is not only suitable for application in the EUROCONTROL and ECAC Member States, but also in other parts of the world with minor adaptations.

4. BENCHMARKING

4.1 An initial benchmarking of air navigation services across EUROCONTROL Member States was published in PRR 3 in 2000 (ref. 2) and updated in 2001 (ref. 5). Econometric techniques were applied to correlate en-route costs per State with explanatory variables such as distance flown and traffic density. Most of the variance could be explained ($R^2=0.96$). The remaining variation from the cost model gives an indication of cost-effectiveness in any given State compared to the average.

4.2 There is a question whether the best cost-effectiveness performance in the area is close to the efficiency frontier. As a first attempt to answer this question, the PRC published initial comparisons between the United States' and European ATM systems in PRR 4 (ref. 2). The United States was chosen because both systems are structurally rather similar, with similar airspace volume, traffic concentration around major airports and average route length. An update of this analysis is published in PRR 6 (ref. 2).

4.3 The difference in cost-effectiveness identified in the initial United States versus Europe comparison was then examined through a comparison of selected Area Control Centres (ACC). Results are being published in the summer of 2003.

4.4 As European ANSPs were required to provide information relating to the year 2001 by 15 July 2002, it is now possible to conduct more detailed cost-effectiveness analyses for both en-route and terminal ANS at ANSP level⁴, and also productivity analysis at an ACC level⁵. The first European ANSP benchmarking report (ACE 2001) is being prepared for publication in 2003, based on year 2001 data submitted by all European ANSPs on a mandatory basis. It is intended to publish an annual benchmarking report of European ANSPs.

4.5 Contacts have been established with the Civil Air Navigation Services Organisation (CANSO), so as to maximise cross-fertilisation and avoid duplication with its benchmarking work.

⁴ In Europe, boundaries of States and ANSPs are not necessarily aligned. One example is the Maastricht UAC, controlling the upper airspace of Belgium, Luxembourg, the Netherlands, and Northern Germany.

⁵ Cost data are available at ANSP level, but not yet at ACC level.

5. RELATIONSHIP WITH ICAO WORK ON ATM PERFORMANCE

5.1 ICAO is at present developing concepts for ATM performance, notably in the context of the ATM Operational Concept Panel (ATMCP). Five levels have been identified for ATM performance as shown in *Figure 3* below. Progress in EUROCONTROL described in this paper relates principally to Level 2 RASP (Required ATM System Performance) and more specifically to its cost-effectiveness component.

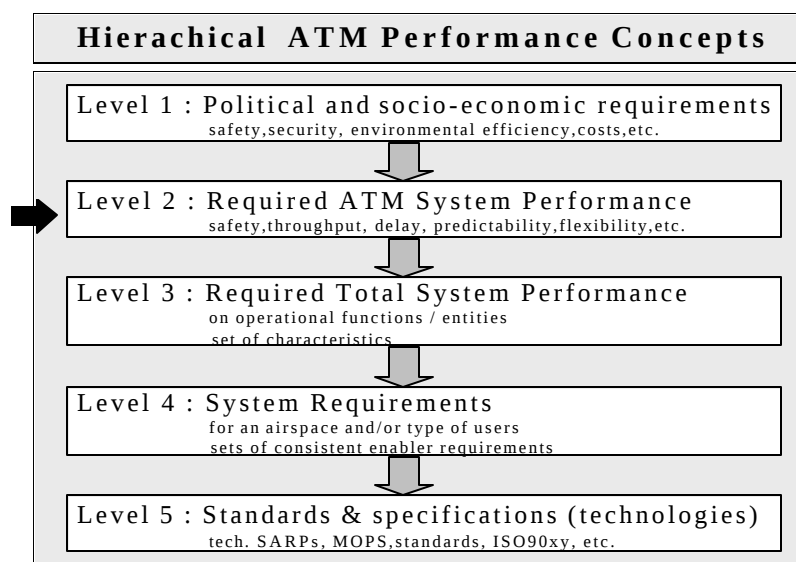


Figure 3. Hierarchy of ATM Performance Concepts

5.2 The PRC has also developed approaches to ATM performance in terms of safety, delays and flight-efficiency, and published related information in Performance Review Reports.

Other Key Performance Areas such as predictability will be addressed in due course.

5.3 At its meeting in January 2003, the Air Navigation Services Economic Panel (ANSEP) of ICAO established a working group to develop guidance material for measuring and benchmarking of ATM performance. The EUROCONTROL Agency has undertaken to contribute actively to this group as well as to other ICAO groups where ATM performance is addressed.

5.4 Experience has shown that standardised definitions, data reporting requirements and methodologies are required to conduct economic analyses of ATM performance.

5.5 It is recommended that ICAO assesses the need for world-wide standardisation of minimum reporting requirements, considering as a basis the Specification for Information Disclosure adopted in EUROCONTROL (ref. 4).

6. ACTION BY THE CONFERENCE

6.1 The conference is invited to:

- a) note progress as regards the analysis of economic performance of ATM and benchmarking within Europe, as well as in respect of the comparison between the ATM systems in Europe and in the United States;
- b) recommended that ICAO assesses the need for world-wide standardization of minimum reporting requirements, considering as a basis the Specification for Information Disclosure adopted in the EUROCONTROL Organisation; and
- c) recognize that the EUROCONTROL Organisation's experience in the field of ATM economic performance can be made available to ICAO as required.

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