A SINGLE EUROPEAN SKY

Broadening horizons for air travel

EUROPEAN
COMMISSION

CONTENTS

The European Commission's Directorate-General for Energy and Transport develops and carries out European Union policy in these closely linked areas. The 2001 White Paper, ***European transport policy for 2010: time to decide*** sets out 60 practical measures designed to bring about significant improvements in the quality and efficiency of transport in Europe by 2010, and to break the link between economic growth and growth in the demands on transport systems. The radical development of European air traffic management envisaged by the single European sky proposals forms a key building block of this overall transport strategy.

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SEIZE THE MOMENT

Airspace is a valuable but finite resource.

Due to the ever-increasing importance of air travel, inefficient use of its airspace has become a real constraint on Europe's economic growth and international competitiveness. It also jeopardises Europe's world-class air safety record, and undermines efforts to reduce the considerable greenhouse gas emissions of European air transport.

The radical overhaul of European air traffic management envisaged in the proposals for a single European sky is a key building block of the Community transport policy set out in the White Paper of September 2001. In March 2002, the European Council in Barcelona highlighted the urgency of bringing about the single European sky by 2004.

It is obvious to most airline passengers that if a European air traffic control system were to be designed from scratch it would look quite different from the fragmented system we have today.

The present system, dating back to the 1960s, is patched together from even older national systems. It segments European airspace into small, inefficient blocks which use a variety of different air traffic control technologies.

This system is now showing signs of strain. In 2001, one out of every four European flights was delayed. Crisis point will soon be reached if air traffic control capacity improvements continue to lag behind increases in air traffic itself.

Earlier attempts to reform air traffic management, mainly centred on the pan-European air traffic organisation Eurocontrol, have created capacity but are insufficient to respond to fresh challenges.

The European Commission's proposal for a single European sky is an ambitious attempt to reform the outdated architecture of European air traffic control. It comes at a time when new air traffic and aircraft positioning and communication technologies offer opportunities for significant improvements in the efficiency and safety of air travel.

The Commission's aim is to encourage safe, efficient and dynamic use of European airspace, mirroring the single market for aviation services. Its objective is a system that will increase overall capacity as well as optimising the routes flown by aircraft.

The payoffs will be considerable – better use of congested airports, fewer delays, and reduced pollution. Airlines and their customers will benefit from shorter, cheaper flights, and safety will be improved by reducing the strain on pilots and controllers.

The Commission proposes, where necessary, to cut through current decision-making difficulties, building on co-operation where this has already proved successful, but offering new mechanisms where it has failed. The approach will involve consultations with stakeholders, such as controllers, airports and airlines.

National governments and air traffic service providers will be encouraged to team up to create a smaller number of larger, more efficient, blocks of managed airspace. These and other initiatives, negotiated by the stakeholders with the Commission's support, will be given the legal force of Community decisions.

The time has come for Europe as a whole to create the single European sky.

Loyola de Palacio

Vice-president of the European Commission and Commissioner for Energy and Transport

CONTEXT

‘We apologise to passengers . . .’

European aviation is a success story. A decade of market liberalisation has enabled airlines to offer more flights to more destinations, while competition has led to ever-cheaper prices without jeopardising the industry’s excellent safety record. Together, these factors have encouraged more and more people to fly.

This growth in demand is not expected to slow. Despite a recent dip, air traffic in Europe is projected to increase by around 4 % a year for the next 15 years (*see Figure 1*).

However, the capacity of European air traffic control has failed to keep pace with traffic growth. The creation of a single EU-wide air transport market has stimulated the setting up of dynamic new airlines and the expansion of existing national carriers, with large ‘hub’ airports attracting a growing share of the extra business. But air traffic management has struggled to adapt to these changes – services, regulation, technology and decision-making are still largely oriented to national markets.

As the number of flights increases, Europe’s air navigation services – the bundle of air traffic management and supporting services such as weather, communications, navigation and surveillance, and aeronautical information – are failing to achieve required levels of cost-effectiveness, efficiency and reliability. Without radical action, the situation cannot improve. If the upgrading of air navigation services continues to lag behind air traffic growth, congestion and delays will get worse. It is estimated that air traffic control capacity must double by 2015 to accommodate the anticipated increase in traffic.

From patchwork to network

Fragmentation affects European air traffic management in many ways.

A coherent approach to the management of civil and military flights could improve efficiency in ways that benefit both. Europe currently lacks this coherence, while national co-ordination of the civil and military use of airspace also remains poor in many cases.

With airspace managed largely along national lines, cross-border co-operation is often an afterthought, even though a broader approach would bring advantages to all concerned. Cross-border air traffic control would allow the re-routing of flights to relieve a temporary, seasonal, or permanent air traffic black spot in a neighbouring country, for example. At present, a national approach too often prevents such co-operation from being offered.

This outdated focus manifests itself in other ways – air traffic control equipment is still purchased nationally, so compatibility with systems used by neighbouring countries is not guaranteed.

The cost of fragmentation

This fragmentation results in the inefficient use of airspace, leading to congestion, delays and additional pollution, and unnecessarily inflating costs for airlines, airports and the travelling and non-travelling public. An estimated 350 000 aircraft flight hours a year are wasted due to inefficient air traffic management and airport delays.

Attempts have been made to address the problem – most notably in the last decade by Eurocontrol, Europe's 31-nation intergovernmental organisation for air traffic management. Eurocontrol has accumulated valuable technical expertise, and has made efforts to improve the use of Europe's airspace by tackling a number of air traffic problems. But it lacks the authority to enforce its decisions on national governments, even when they have agreed to them.

The result is that many of Eurocontrol's initiatives have been patchily applied, or not applied at all. Meanwhile, its broadening membership has resulted in attention being diverted from the central problem of congestion in the core area of Europe.

Political vacuum

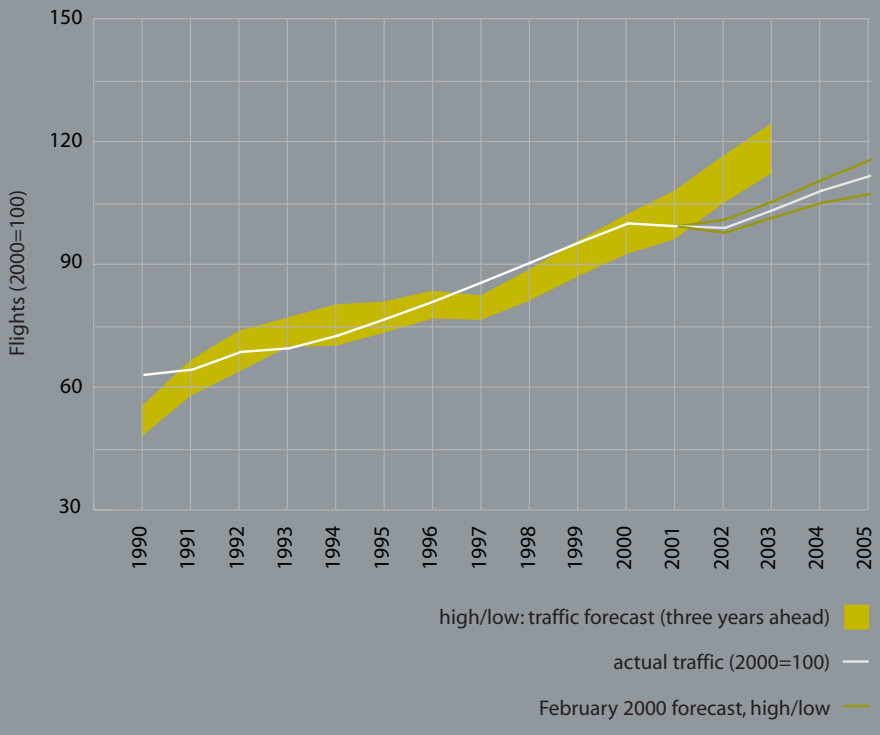
To develop EU-wide air traffic solutions, and to ensure that they are properly implemented, requires both technical expertise and political clout. No European institution currently possesses this combination of strengths, which is essential to tackle the many problems created by fragmentation.

To fill this gap, the Commission proposes a fresh approach that puts the proven Community decision-making process, combined with Eurocontrol's technical know-how, at the centre of attempts to reform the current air traffic management system. The development of air traffic management is a central element of the Community transport policy set out in the White Paper of September 2001. At the same time, the single European sky proposal is not an initiative imposed from above, but a response to demands for action from airlines and other users.

Do you read me?

To maintain voice contact with the air traffic control centres along the route, a pilot flying from Brussels to Geneva today needs to change radio frequencies nine times. The single European sky proposals envisage on-board information systems that minimise the need for voice contact. Information will be exchanged with the ground via a seamless data link, and pilots will be able to see the locations of nearby planes at all times. Such systems will improve safety and efficiency by easing the workload of pilots and controllers and eliminating the risk of misunderstanding between them.

Figure 1: European air traffic demand
Source: Statfor



European air traffic has increased by an average of 5 % per year since 1990. After a dip in 2001-02, the trend is expected to resume.

HOW A SINGLE EUROPEAN SKY WILL BENEFIT EUROPE

Reinforced safety

The patchwork of different procedures which hampers EU-wide co-operation is made worse by the current lack of common standards for the organisations that provide air navigation services. One of the single sky's key priorities is to establish minimum conditions which providers will have to meet, if they are to continue operating.

Standardised European reporting of incidents will be a central feature of these conditions. At present, the way data is collected varies widely across Europe, making it impossible to identify where flaws or deterioration are affecting safety. Worse still, air navigation service providers do not collect or share information, so that valuable and potentially life-saving lessons about risk situations and their solutions are lost.

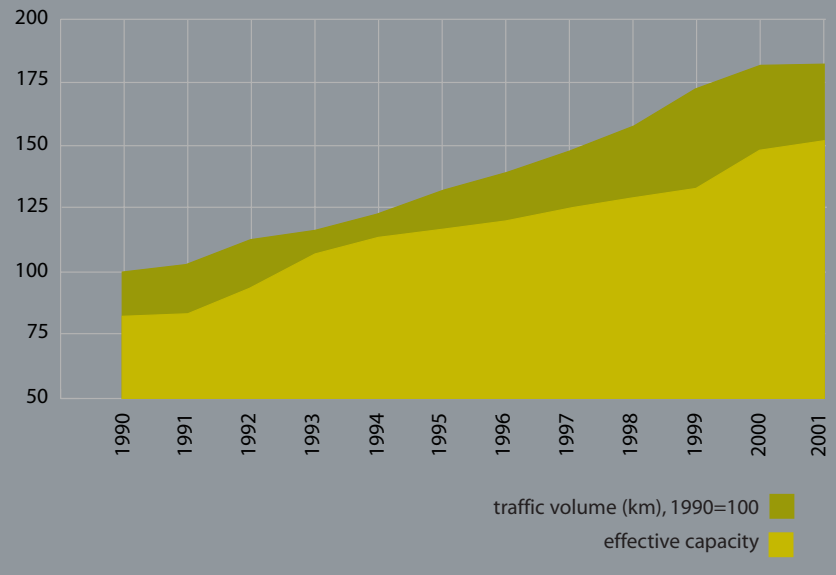
In addition, not all countries have heeded demands for the introduction of essential safety back-up tools. Now long overdue in some cases, these systems could prevent the errors that are so often responsible for accidents. For example, the use of wireless data exchange as a back-up to spoken communication between air traffic control centres and aircraft crews still needs to be uniformly introduced.

To ensure a consistently high level of safety, common standards for the training and work of air traffic controllers also need to be drafted. Such standards will enable staff trained in one country to seek work in another – a vital step to remedying the serious shortage of qualified controllers, which is worsening. An EU-wide framework for the profession will pave the way for other initiatives to address staff shortages and overwork, which are among the main causes of delays and accidents, respectively.

Flying in straight lines

Aircraft should be able to connect any two points in Europe by the shortest route. But today's fixed-route air traffic network confines planes to indirect 'corridors' that avoid military airspace. Under the single European sky proposals, free-route airspace will reduce journey times by allowing operators to select optimal routes. Real-time sharing of accurate flight data will enable air traffic controllers to resolve conflicts earlier than they can with current systems, reducing their workload and improving safety.

Figure 2: European air traffic management capacity shortfall
Source: CRCO & PRU



European air traffic management capacity has grown steadily since 1990, but has lagged traffic growth by around three years. Each year, the consequent delays have cost users alone between € 1.3 and € 1.9 billion.

Increased capacity

European air traffic control capacity has been growing steadily, but for more than a decade has consistently lagged growth in demand by around three years (*see Figure 2*). And, in contrast with the apparently irrepressible increase of air traffic, the current fragmented air traffic control system has limited scope for further growth.

The economic slowdown following 11 September, and the reduction of separation distances between aircraft in the upper airspace, led to a fall in delays. But the dip in traffic is expected to provide only a brief breathing space before pressure is renewed (*see Figure 1*). Since 1999, delays have remained at a stubbornly high level, indicating that the main causes of en-route delays have not been tackled.

Some national authorities have made vigorous attempts to boost capacity. Unfortunately, these have not always been co-ordinated with neighbours, whose problems they have sometimes exacerbated. As capacity shortages worsen, such off-loading of local problems – however attractive at national level – appears an increasingly short-sighted strategy.

The Europe-wide approach of the single sky proposal addresses the need for wider solutions making possible the highly flexible use of airspace in Europe. Cross-border co-operation will make it much easier to tackle seasonal and other differences in the number, type and destination of aircraft. Many of the technological advances in navigation systems also demand wider-ranging but more closely co-ordinated air traffic management policies.

The biggest rewards from capacity improvements will come from a concerted approach which tackles the major traffic bottlenecks – in particular, those created at the crossroads of most north-south and east-west European flights. This area, covering southern England, the Benelux countries and France, is the cause of two-thirds of all air traffic delays.

Improved efficiency

A recent study of air traffic performance in Europe and the US showed the latter to be capable of handling twice as many flights at almost the same cost as current European operations.

Many factors underlie this difference, but Europe's present system displays huge variations in capacity and efficiency. The single sky approach will result in a radical restructuring of airspace, producing a new, more efficient configuration that will help to iron out delays. Poorly performing air traffic control sectors will be encouraged to improve their capacity. Providers of air navigation services will have to publish performance figures. This should slash the current annual bill for air traffic delays – which at € 4.4 billion is roughly equivalent to the cost of air navigation services themselves. Very large quantities of fuel could also be saved. Better air traffic management would cut fuel consumption by between 6 % and 12 %, according to some estimates.

Greater transparency

Setting out standards for the approval of air traffic service providers will be the first step in a process aimed at transforming sometimes unresponsive monopolies into customer-friendly and cost-conscious businesses. To create a clear framework of rules and responsibilities, legislation will lay out service providers' obligations as well as procedures for their supervision by national regulators.

THE SINGLE EUROPEAN SKY PACKAGE

A Community approach

The European Community's philosophy is for individual countries to pool their powers where their combined efforts will be more effective than the sum of local, go-it-alone initiatives. Many aspects of European air traffic management could benefit from a more co-ordinated approach based on current Community practice in other sectors, where jointly-made decisions are legally binding, with follow-up to ensure that they are being carried out.

The single European sky initiative proposes that the most important and urgent changes to air traffic management become part of the democratic Community decision-making process. In other areas, where local and regional action is likely to produce the best results, the focus is on fostering co-operation. Local or regional air traffic management initiatives can be adopted as Community decisions if and when their backers believe that this is useful. To ensure that the solutions developed really meet the needs of airlines and other stakeholder groups, they will be involved in the process at all times.

National governments will continue to decide who provides air traffic services on their territory, and will take the lead in proposing the local reorganisation of air traffic control areas to boost efficiency and increase capacity. Eurocontrol will continue to play a key role, applying its technical know-how to the assessment of the technical merits of air traffic improvements, and making proposals for fresh initiatives.

The European Commission has proposed the end of 2004 as the deadline for putting in place the laws that lay the foundation for the single European sky framework.

The Commission's proposals

The Commission's proposals for the single European sky aim:

1. to improve further the safety of Europe's air transport system
2. to streamline decision-making mechanisms:
   - combining Community regulation and Eurocontrol's technical expertise;
   - taking into account the pan-European dimension;
   - integrating military operators;
   - involving the social partners in dialogue;
   - providing a platform for the rapid introduction of new technologies;
3. to increase the system's efficiency:
   - merging the current national regions to create a single European upper airspace;
   - organising upper airspace on principles of flexibility and efficiency, with a view to the eventual abandonment of 'air corridors';
   - defining upper airspace air traffic control zones on the basis of operation efficiency rather than nation boundaries;
   - accelerating the introduction of new technologies through standardisation;
   - opening the provision of additional air navigation services to competition;
   - ensuring that the air navigation service charges paid by airlines are fair, transparent, efficient and related to costs;
   - managing traffic flow more efficiently, transparently and equitably.

Streamlined decision-making

A new committee dedicated to single European sky issues will be created to assist the Commission with the transformation of proposals into Community law. The single European sky committee should include a civil and a military air traffic management representative from each EU Member State, as well as a representative of Eurocontrol. Where the committee agrees the proposal, it can become law. Where it disagrees, the matter will be handed on to ministers.

This streamlined procedure will immediately be applied to the backlog of essential Eurocontrol rules that have not been properly put in place or enforced so far, as well as to new proposals. It should rapidly result in a large body of Community law covering air traffic management. It will also help the Community to target priorities for action, for example in areas of core air traffic congestion.

This work is not limited to the 15 EU Member States. Arrangements are in hand to involve non-EU countries such as Switzerland, to ensure that the single European sky is applied as widely as possible throughout Europe.

Reaching cruising altitude

Today, the height of the boundary between upper and lower airspace varies across the European Union. This means that planes must often climb or descend as they pass over the borders between two Member States. The single European sky proposals foresee the reorganisation of airspace into a uniform, Europe-wide system that will enable aircraft to fly optimal trajectories. This will save time and fuel, and – by removing complexity – will increase safety.

IMPROVED AIR TRAFFIC SERVICES

Common rules and standards

Currently, air navigation services are often supervised by the same authority that provides them. The single European sky initiative will improve the environment in which these services are offered by ensuring that providers are supervised by separate, independent national authorities, in order to avoid conflicts of interest, and by laying down standard performance criteria. The approach will also lead to the adoption of ambitious and binding targets to maintain and improve safety in the context of anticipated air traffic growth.

The proposed changes will make service providers more responsive to their main customers. To reward fast and efficient performance, incentives will be built into the new rules – at present, providers recover their costs whatever the quality and level of service.

In this way, the new regime will help to direct investment to where it is most needed. The lack of such a mechanism until now has contributed to the unevenness of service standards. Europe currently suffers from the inefficient proliferation of air traffic control centres, radar, communications, and navigation systems. Such duplication leads to unnecessary investment, raises maintenance and operating costs, and increases the complexity and cost of co-ordination.

Diagram 1: Non optimal flight levels
Airspace congestion obliges aircraft to fly along suboptimal trajectories

A competitive market

Basic air navigation services, especially air traffic control, naturally lend themselves to monopoly provision. But this argument is harder to make for supporting services such as weather, communications, navigation and surveillance, and aeronautical information services. The Commission proposes to open these to competition across Europe, to all suppliers that meet commonly agreed standards.

Fairer charges

Air navigation services can be unbundled, enabling suppliers to offer particular services separately, with charges related to costs. Service providers' performance – on delays, for example – will be published, helping to make them accountable to their customers and putting them under pressure to improve efficiency.

For the first time, the new rules should make possible the clear comparison of air traffic service costs across Europe. The combination of performance incentives and mechanisms for accountability will stimulate much-needed investment in key air control centres. In addition, service providers will be encouraged to co-operate with one another – perhaps combining some operations, where savings and improvements can be achieved.

The whole picture

At present, only the pilot and a single air traffic controller have accurate information about a flight's status at any moment. Conflicting flight paths cannot be identified early, since each control centre must wait for information from its neighbour. Ground service operators cannot adjust their plans, so delays are compounded. The single European sky will introduce a system that makes accurate information available to all operators at all times – enhancing safety and efficiency, and increasing capacity.

EXPECTED BENEFITS

- ***The single European sky will ensure that high European safety standards are maintained and even improved.***
- ***It will deliver savings and efficiency improvements by encouraging cross-border co-operation between service providers.***
- ***Targeted EU funding and more transparent charging will allow resources to be applied to solving particular congestion problems, with Europe-wide benefits.***
- ***The single European sky will help to control charges for air navigation services, currently over 5 % of airlines' total costs, with estimated annual savings of up to € 1 billion.***

MANAGING OUR COMMON AIRSPACE

One sky, one set of rules

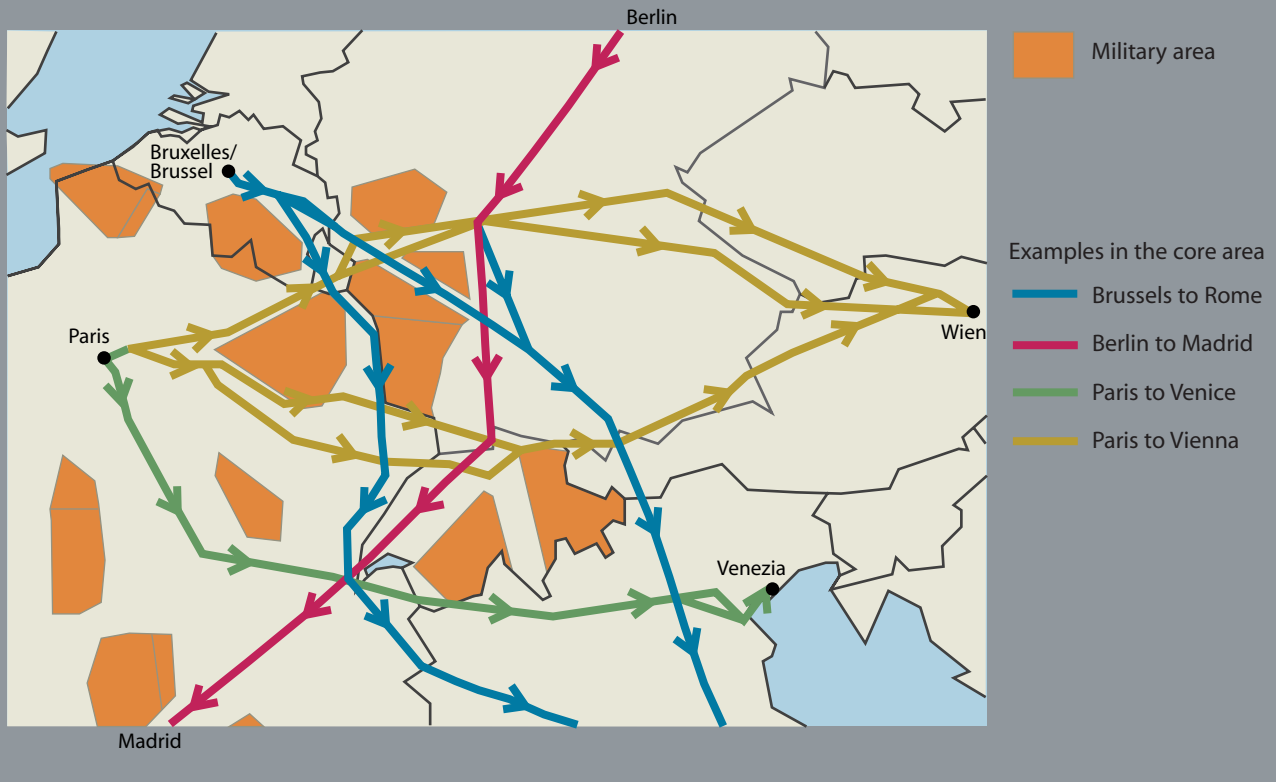
As a first priority, the single European sky initiative will create a common European upper airspace – the altitudes at which most air traffic flies. Boundaries for the provision of services in the upper airspace, currently based on history and geography, will be redrawn to maximise efficiency. Large 'functional blocks' of airspace, governed by one air traffic service provider or by several in close co-operation, will improve efficiency and reduce costs by rationalising provision.

Common principles will be established for the design of air traffic control sectors, as well as methods for assessing their capacity. At the moment such tools do not exist, although the wide variation in similar sectors' current workload suggests that there is considerable scope to improve efficiency.

Larger blocks of airspace, both within countries and across borders, will allow more flexible and efficient management of air traffic. For example, they will make it easier to take advantage of alternative routing to reduce overloads. At national level, some transfer of workload between control centres has already occurred. In France, some air traffic control was transferred from the overloaded air traffic centres at Reims and Aix to underused Brest and Bordeaux, for example. The single European sky will similarly allow EU-wide co-ordination of air traffic controllers to direct their efforts towards problem points.

Over time, the Commission intends to apply the same approach to Europe's lower airspace – the level in which aircraft take off and prepare for landing.

Diagram 2: The military dimension complicates the picture
Today the most used routes avoid military areas



Integrating civil and military airspace

Better civil-military co-ordination has the potential to deliver considerable capacity gains, and is a key element of the single European sky initiative.

The military claim on airspace can take the form of prohibited, restricted, dangerous, and temporarily segregated areas. At present, there are around 500 segregated areas in European upper airspace. But even though restricted and danger areas are not employed round the clock, many are not made available for use by civil aircraft for a part of the day, as they could be. Nor are civilian and defence flight paths rationalised. Military training flights frequently close off valuable airspace to airlines, forcing them to take roundabout routes that waste fuel, time and money. With better preparation, different military bases could often be used instead.

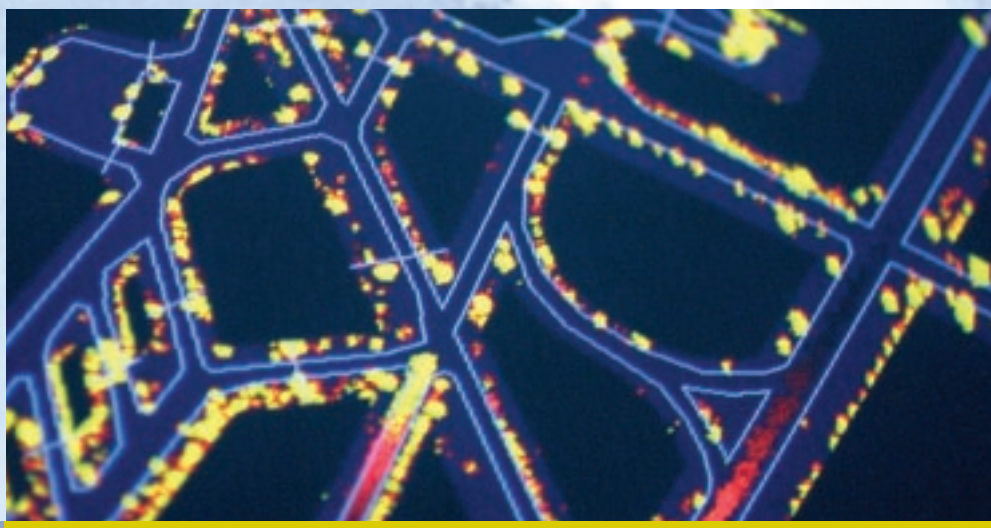
The cost of this lack of co-ordination is considerable, especially where airlines are excluded from airspace in Europe's most congested regions. In the area around the borders between Belgium, the Netherlands, France and Germany, for example, a large and growing volume of civil traffic is channelled into a narrow corridor due to the proximity of several military training areas.

Co-ordinating traffic flow

European airspace should be managed as a single continuous whole, for the maximum benefits of all user groups.

The single European sky aims to enhance air traffic management efficiency, to make better use of capacity and to improve the handling of congestion by creating mechanisms for setting priorities and dealing with crises. As part of this initiative, comprehensive common European rules for scheduling aircraft departures and arrivals will be drawn up and enforced.

Currently, mismatches between airport slots and airspace availability frequently exacerbate delays and congestion. To improve this matching, ground and airborne operations will also be better integrated into traffic flow management.



Less is more

Today, European air traffic control involves complex and inefficient co-ordination between many small national and sub-national systems. A key element of the single European sky proposals is the redesign of Europe's air traffic control system into a much smaller number of optimally-sized 'functional airspace blocks'. Starting with the upper airspace, this rationalisation will save costs and increase capacity by removing unnecessary duplication of equipment and facilitating investment in fully compatible systems.

EXPECTED BENEFITS

- ***The single European sky will enable aircraft to take direct routes, saving airlines time and money, and reducing environmental impacts.***
- ***Improved cross-border co-ordination will significantly reduce delays.***
- ***Better military-civil co-operation will ease the worst congestion problems at the heart of Europe.***

ALIGNMENT OF NATIONAL EQUIPMENT AND SYSTEMS

Flexibility and enforcement

Single European sky reforms promoting larger blocks of managed airspace should lead to greater uniformity in the purchase and use of air traffic equipment and systems across Europe. This should, in turn, help bring down the cost of equipment, as well as ironing out some of the inefficiencies associated with the parallel use of multiple technologies and systems.

New technologies will deliver the greatest benefits in larger, uniformly equipped blocks of airspace. Sophisticated positioning equipment will give aircraft freedom to navigate outside traditional traffic flows, for example.

The Commission's proposals seek to guarantee that new equipment and systems will contribute to the creation of a single European sky by enabling interoperability, co-ordination and co-operation. This will be done using the same mechanisms that have helped to bring about other integrated services such as high-speed European trains. Eurocontrol and other standard-setting bodies will draw up technical standards guaranteeing interoperability of systems or equipment.

New technologies

To stimulate the development of new technologies, equipment and systems, the Community proposes to direct funds immediately from its trans-European network and research programmes towards capacity and safety innovations that support the introduction of the single European sky.

The Community's sixth research framework programme (FP6, 2002-2006) identifies the current framework of air traffic management as one of the main brakes on a successful European aeronautics industry, and targets this area as a research priority with a budget double that devoted to it in FP5. The aim is to make possible a seamless, Europe-wide, satellite-based air traffic management system capable of handling three times as many flights as today safely in all weathers, and of ensuring that 99 % are on time.

In March 2002, the Transport Council unanimously approved the release of € 450 million for the development of the Galileo European satellite navigation system, Europe's answer to the US GPS system. The 30-satellite network will be deployed and operational by 2008, when it will provide a European platform for advanced aircraft navigation and air traffic management systems.

EXPECTED BENEFITS

- ***A Europe-wide market for air traffic systems and equipment manufacturers will encourage industry to invest in research and development.***
- ***Economies of scale will bring down the cost of systems and equipment for service providers.***
- ***Community funding of key research and infrastructure to support single European sky objectives.***

Further information

Click here…

- For information about air transport issues in Europe see the Energy and Transport DG's web page at:
  http://www.europa.eu.int/comm/transport/ themes/air/english/at_en.html
- The European Commission's ***Single European sky*** homepage is at:
  http://www.europa.eu.int/comm/transport/
  themes/air/english/single_eur_sky_en.html
- The ***latest available statistics*** on European transport are available at:
  http://www.europa.eu.int/comm/energy_transport/ etif/index.html
- Further information about EU framework programme ***transport research*** can be found at:
  http://europa.eu.int/comm/transport/extra/ home.html

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This brochure outlines the European Commission's view for a single European sky and its potential benefits to the airline industry and those who travel by air.

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