



# **EUROCONTROL** Long-Term Forecast

Flight Movements  
2008 – 2030





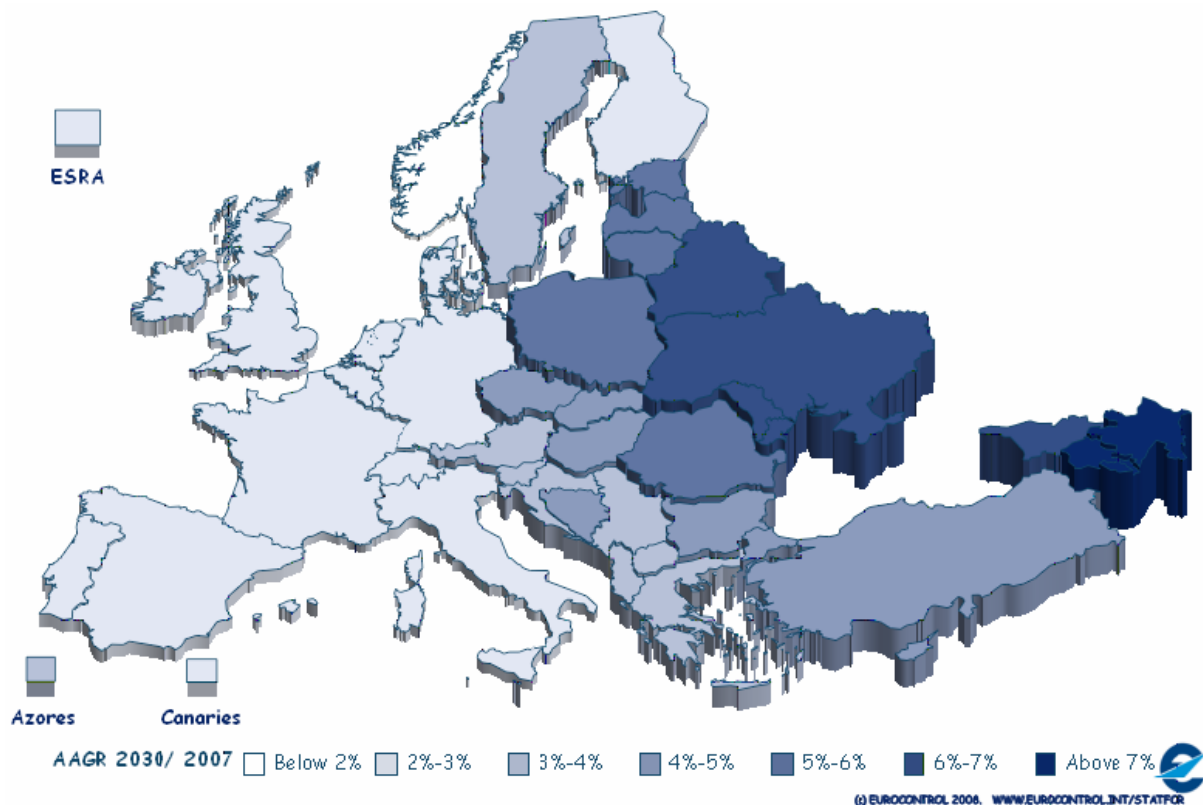
## EXECUTIVE SUMMARY

This report presents the EUROCONTROL Long-Term Forecast of IFR traffic in Europe to 2030. This forecast focuses on the developments between 2015 and 2030; the traffic between 2008 and 2014 is discussed in the Medium-Term Forecast published in February 2008. The forecast has been prepared as part of the *Challenges of Growth 2008* project. This forecast replaces the Long-Term Forecast issued in December 2006. The EUROCONTROL Long-Term Forecast will next be reviewed in 2010.

The forecast uses four scenarios to capture the possible futures for the aviation industry. Any user of the forecast is strongly advised to consider all four scenarios as a means to manage risk. There are also a number of other important risks which the forecast has not included. In particular, the possibility of changes to the routing of traffic, major external events and delays in projects for network improvements.

**The forecast is for between 16.5 and 22.1 million IFR flight movements in the EUROCONTROL Statistical Reference Area (ESRA) in 2030, between 1.7 and 2.2 times the traffic in 2007. This is an average growth of 2.3%-3.5% per year. The growth will be distributed unevenly in time and across regions.**

**Figure 1. Average annual growth 2007-2030 for each State (Scenario C: Regulation & Growth)**



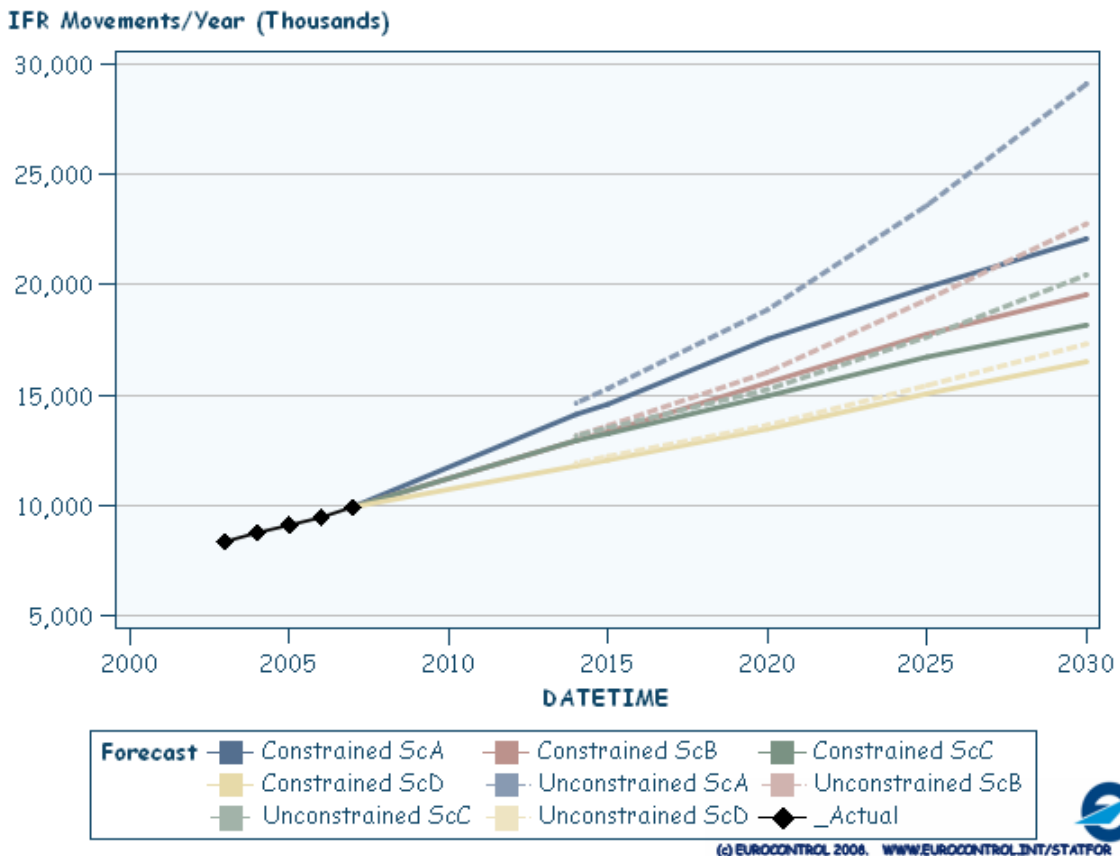
Growth, shown in percentage terms in Figure 1, is stronger in Eastern Europe where the market is relatively less mature and the States are catching up with the more developed Western economies. Turkey and Poland will join the top 10 busiest States in Europe by 2030. In absolute figures, it is the bigger airspaces that will see the biggest numbers of additional flights and the busiest States will continue to add the most traffic to the network.

**Figure 2. Summary of the forecast for the ESRA.**

	IFR Movements(000s)						Average Annual Growth						AAGR 2030/ 2007	Traffic Multiple 2030/ 2007
	2006	2007	2014	2020	2025	2030	2006	2007	2014	2020/ 2015	2025/ 2021	2030/ 2026		
A: Global Growth	.	.	14,119	17,532	19,890	22,086	.	.	5.2%	3.8%	2.6%	2.1%	<b>3.5%</b>	<b>2.2</b>
B: Business as Usual	.	.	12,930	15,553	17,763	19,549	.	.	3.9%	3.1%	2.7%	1.9%	<b>3.0%</b>	<b>2.0</b>
C: Regulation & Growth	9,439	9,916	12,930	14,955	16,724	18,170	3.9%	5.1%	3.9%	2.5%	2.3%	1.7%	<b>2.7%</b>	<b>1.8</b>
D: Fragmenting World	.	.	11,773	13,460	15,062	16,507	.	.	2.5%	2.2%	2.3%	1.8%	<b>2.2%</b>	<b>1.7</b>

Growth is faster in the early years of the forecast and slowing down later due to increasing maturity of the market, pressure on higher ticket prices (e.g. due to rising oil and CO<sub>2</sub> prices), and increasing congestion of the airports which are not able to serve the forecast demand in the later years. The planned capacity at 138 reviewed airports will increase by 41% in total by 2030 but the demand will exceed the capacity of the airport system by as many as 7.0 million flights in the high-growth scenario A: Global Growth in 2030. 14-39 European airports will need to operate at their full capacity 8 hours per day to serve the demand, similar to what Heathrow does now.

**Figure 3. Demand exceeds the capacity of the airport system.**



**EUROCONTROL Long-Term  
Forecast: IFR Flight Movements  
2008-2030**

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This report presents the forecast of annual numbers of instrument flight rules (IFR) movements between 2014 and 2030, prepared by the EUROCONTROL Statistics and Forecast Service (STATFOR) in May-November 2008. The forecast has been prepared as part of the <i>Challenges of Growth 2008</i> project and it replaces the Long-Term Forecast issued in December 2006.		
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## 1. INTRODUCTION

### 1.1 General

This report presents the forecast of annual numbers of instrument flight rules (IFR) movements between 2014 and 2030, prepared by the EUROCONTROL Statistics and Forecast Service (STATFOR) in May-November 2008. The forecast has been prepared as part of the *Challenges of Growth 2008* project (Ref.1) providing data to other work packages looking at the challenges of the forecast air traffic out to 2030. This forecast replaces the Long-Term Forecast issued in December 2006 (Ref.2). The EUROCONTROL Long-Term Forecast will next be reviewed in 2010.

This report contains a summary and discussion of the forecast, including annual total forecasts (Annex F), more details for the ESRA (Annex E) and geographical definitions (Annex C, Annex D).

STATFOR also prepares a short-term forecast (2 years) and a medium-term forecast (7 years). Both are available in summary on the STATFOR web pages (Ref.3).

### 1.2 Summary of Forecast Method

**The EUROCONTROL Long-Term Forecast grows IFR traffic using a model of economic and industry developments. It then calculates overflights by assuming that the routes between airports that were observed in 2007 continue to be used.**

The long-term forecast (LTF) is developed by growing baseline traffic<sup>1</sup> using a model of economic and industry developments, taking into account factors related to passenger demand, economic growth, prices, air network structure and fleet composition. Two key constraints are:

- It is assumed that **routing** between airport pairs follows the same patterns observed in 2007. No calculations are made of the influence of future route networks, or of changes by aircraft operators in choice of route.
- The forecast is constrained by annual **airport capacities**.

More detail of the method is given in Annex B.

Four 'scenarios' are used to capture the likely range of growth of flight movements. These are designed to describe four qualitatively different futures for the air traffic industry. The scenarios are detailed in section 3.

Experience in recent years has shown the need to take the whole forecast range (all four scenarios) into account. For this new forecast, the main areas of uncertainty are discussed in sections 2 and 4.2.

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<sup>1</sup> The baseline is all IFR flight movements for the whole of 2014, as forecasted by the medium-term forecast (Ref. 7)

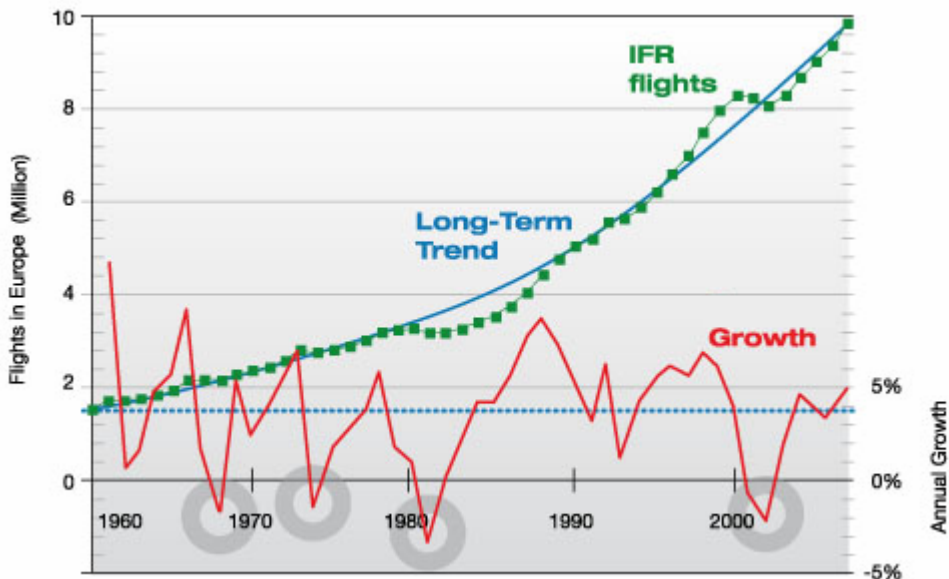
## 2. WHAT MIGHT FUTURE DEMAND BE LIKE?

**There is plenty of potential for further growth of air traffic in Europe. But the demand is not homogenous and the traffic growth will not be uniform.**

The simple, smooth growth curves that are often seen in air traffic forecasts can encourage us to plan simplistic, one-size-fits-all solutions. These curves lull us into believing that air traffic is a homogeneous mass swelling at 3-4% per year, that just needs a firm hand to accommodate and manage its growth.

But air traffic demand is far from homogeneous, and its growth is far from uniform or guaranteed. Figure 4 shows the dips in growth related to oil crisis in the 70's and 80's, the recovery in the following years, the drop after the 11 September 2001 and the restoration of growth thereafter.

**Figure 4: Growth in air traffic is far from uniform**



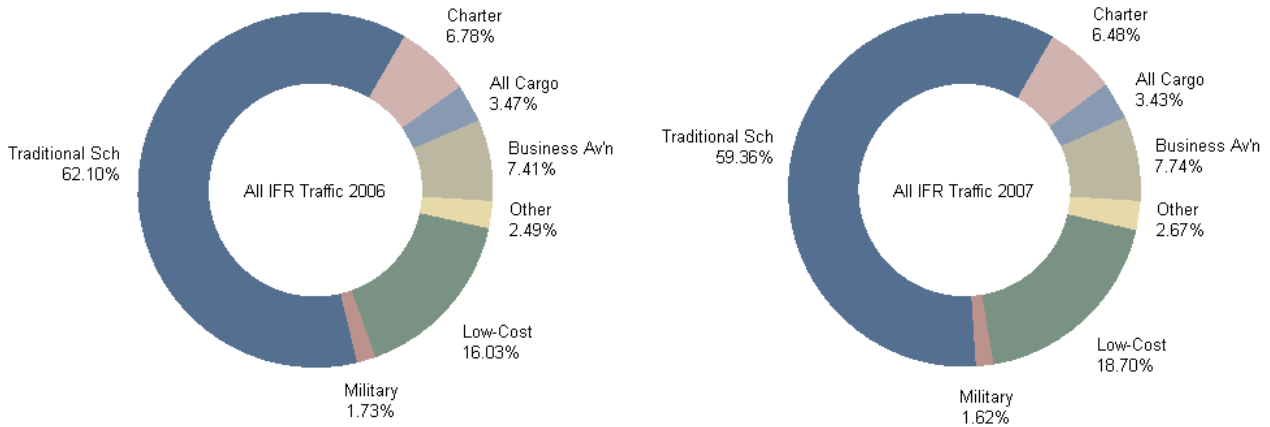
Air traffic is composed of a number of market segments each having its specific patterns of operation and addressing differing needs of the demand for flights:

- There are the **traditional scheduled** carriers, with their regular schedules carrying passengers and freight between major political and population centers.
- The **charter** specialists, with high Summer peak passenger demand to specific holiday destinations often from airports with very limited scheduled traffic.
- The **low-cost** carriers focused on leisure passengers, half eating into the existing markets, half building entirely new ones.
- The **business aviation** at the other side of the spectrum operating business passenger services at very short notice on an extraordinary variety of routes, mostly short-haul and rarely competing directly with scheduled traffic (Ref. 4).
- The **all cargo** carriers often having regular schedules and networks, but operating at different times of day and to different airports than the scheduled passenger carriers (Ref. 5).
- The **military**, flying under civil or military control needing sometimes routes, but

more usually volumes of airspace.

- Then the rest, mostly general aviation.

**Figure 5. The changing share of market segments (2006 v 2007).**



The aggregate of traffic may be relevant to some challenges such as CO<sub>2</sub> emissions, but most air traffic demand is specific to a place and time, so each ATM challenge has a different composition and will evolve in a different way.

- The growth in airport terms and in airport-pair terms is far from uniform, the contribution of individual airports to the additional traffic in Europe has been very uneven in the recent years with a relatively small group of airport contributing by a large share to the overall traffic growth.
- Moreover, the increase in flights (which is of interest to ATM) does not always imply an increase in actual seats flown (which interests aircraft operators). So the flights or flight-km that are appropriate for measuring ATM demand are distinct from available seat km or revenue passenger km.
- For most countries in Europe, most of their traffic is overflights. This means that it is quite possible to see rapid growth or decline in traffic over a period of months, much larger than a typical change in traffic between two countries.
- Arrival/departure flows can be fickle, as a tourist destination expands rapidly for a few years, then stagnates or retreats. This creates challenges which could have evaporated before a solution is brought into service.
- Airport demand can be very concentrated in time, concentrated within the day at times of arrival-departure waves for a particular carrier, or concentrated within the week on change-over days at holiday destinations. Major planned events (such as the Olympics or World Cup) or unplanned events (strikes, storms) can change demand fleetingly, consuming considerable ATM effort.

So, having established the multi-faceted, changing nature of ATM demand, what trends can be used to guide planning?

- Because of the continuing symbiotic link between economic growth and traffic growth, the prospect is for more growth in Europe, but the airports will struggle to accommodate that demand. At the same time, not all airport capacity will be used – there will be spare capacity particularly at smaller airports where geographically there is little demand.
- For many years, travelling (not just by air) has become cheaper in real terms.

Perhaps this will not continue indefinitely.

- Growth outside Europe will be stronger: this means arrival/departure flows and overflight flows making up a larger portion of the traffic, and hub growth in the Middle East for example could reduce transfer traffic in Europe. RPKs of the flag carriers can increase faster than the flown km in European airspace, which will change the balance of costs and profitability.
- The underlying demand will still be based on moving people. So as the world's population becomes increasingly urbanised, that concentration of people will enable economies of scale for airlines: hub-to-hub will increasingly be point-to-point.
- New types of demand may emerge: perhaps air taxi will separate from the rest of business aviation; unpiloted air vehicles will increasingly be looking for space to operate.
- New drivers of growth will become clearer: for example, traffic being determined increasingly by supply factors, as operators buy airframes, then set prices to make a profit with the available capacity.
- Expansion of the European Union has given people (and companies) many more choices where to live, work and spend their leisure time. Open skies agreements alone do not generate such growth. But if Turkey, or the Ukraine, were to get freedom of movement as well as open skies then the traffic patterns of Europe would be transformed again.
- Those same European passengers who are eagerly using the new-found right to fly – turning a luxury into a commodity – are challenging the right of the aviation industry to pollute their local and global environment. New challenges to growth will emerge as regulators explore emissions trading, ticket taxes, fuel taxes, noise charges, local air quality limits, curfews and other measures. However, that the passenger would turn away completely from air travel seems no more realistic than drivers giving up their cars in response to congestion, pollution and the high numbers of road deaths.
- As tourist destinations wax and wane, and as the increasingly service-based economy of Europe shows its ability to shift geographically, it is aviation, more than any other transport mode, that will be able to meet the changing demand. Aircraft operators can reconfigure their network to take in whichever airports have the demand.
- For air traffic, 'co-modality'<sup>2</sup> will, in the medium-term at least, probably continue to mean high-speed train taking over short-haul routes. But its effects are focused on a very few city pairs and the challenges of funding and accommodating high-speed train developments will increase.
- Some of the biggest threats to demand are external to the industry:
  - With oil increasingly an item of speculation and investment and with demand exceeding supply, its price has become disconnected from its cost. Even without taking future supply questions into account, the price is a challenge – and with fuel accounting for 30-35% or even more of costs, further increases must dampen demand.
  - Public transport is a target for terrorists. The costs of protecting the flexible, distributed aviation network are high, although there is little sign so far of attacks deterring passengers in the long-run.

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<sup>2</sup> Keep Europe Moving – Sustainable mobility for our continent. Mid-Term review of the European Commission's 2001 Transport White Paper. Com(2006) 314 final.

- Global environmental changes could affect the peoples' priorities in their travel destinations. Summer vacations in the southern parts of Europe might become less popular with the increasing average temperatures turning demand to more northerly countries. At the same time, the scheduling of the major annual leave might change and shift more to spring or autumn thus changing the traditional pattern of the 'summer peak'.
- A risk of pandemic, as much as it may be perceived as a catastrophic scenario, is nevertheless considered a realistic future by some and could result in considerable changes in the demand and flight patterns.

### 3. FOUR SCENARIOS FOR THE FUTURE

Four scenarios are used in the long-term forecast to capture the future of the air industry. Main storylines of scenarios 'A: Global Growth', 'B: Business as Usual' and 'D: Fragmenting World' are unchanged from the LTF06, scenario 'C: Regulation & Growth' focuses more on environmental challenges and constraints.

The long-term forecast uses a set of scenarios to capture the different possible futures of the air aviation industry in twenty years time. Unlike in the medium-term forecast, which works with the high-base-low variation of the scenarios, in the LTF each of the scenarios has its own storyline summarising the main qualitative characteristics of the future world. These are translated into quantitative terms for each of the factors used in the forecast model.

The scenarios used in the LTF04 and LT06 largely drew on the work done for CONSAVE<sup>3</sup>, ACARE<sup>4</sup> and the IPCC<sup>5</sup>. In the LTF08, the scenarios have similar structure as those in the LTF04 and LTF06, but they have been revised and updated to reflect the current trends and changing views about the future developments. In the preparatory stage for the LTF08 production, a workshop was held in Eurocontrol with the participation of STATFOR User Group members. The aim was to discuss and refresh the scenarios definitions, to capture the evolvments since the last long-term forecast and to align them with current expectations. In result, it has been agreed to keep the number of scenarios at 4, with the same storylines as previously for scenarios A, B and D, and to alter scenario C to focus more on the environmental challenges and constraints faced by the air-industry and World in general.

The four scenarios are:

- Scenario A: **Global Growth**: Strong economic growth in an increasingly globalised economy, with technology used successfully to mitigate the effects of challenges such as the environment and security.
- Scenario B: **Business as Usual**: Moderate economic growth and little change from the status quo, that is, trends continue as currently observed.
- Scenario C: **Regulation & Growth**: Moderate economic growth, but with stronger regulation to address growing environmental challenges for aviation and for Europe more generally.
- Scenario D: **Fragmenting World**: A World with increasing tensions between regions, with knock-on effects of weaker economies, reduced trade and less long-haul travel.

The scenarios are specified by a mix of characteristics shown in Figure 6. When constructed, they were reordered and relabelled from A to D, with A having the highest forecast traffic. Though this is relatively intuitive now when the scenarios are all defined, it was not the initial intention. Due to the complexity of the forecast, the order may change in some cases for some regions (most likely for scenarios B and C which are the closest).

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<sup>3</sup> <http://www.dir.de/consave/>

<sup>4</sup> <http://www.acare4europe.org/>

<sup>5</sup> <http://www.ipcc.ch/>

**Figure 6. Summary of the characteristics of the LTF08 scenarios.**

	<b>A: Global Growth</b>	<b>B: Business as Usual</b>	<b>C: Regulation &amp; Growth</b>	<b>D: Fragmenting World</b>
2014 Baseline	High growth	Base	Base	Low growth
<b>Passenger demand</b>				
Demographics (EU27 share of frequent-flyer age group 25-54)	Aging 2014: 42% 2030: 37%	Aging 2014: 42% 2030: 37%	Aging 2014: 42% 2030: 37%	Aging 2014: 42% 2030: 37%
Age specific propensity to fly	More even across age groups	Shift to older age groups	Shift to older age groups	Shift to even older age groups
Tourism	Increasing long- haul	No change	Shift from Mediterranean	Less long-haul
Open Skies	EU enlargement North Atlantic, Far and Middle East	EU enlargement North Atlantic	EU enlargement	EU enlargement
High-speed rail	98 city-pairs 6 years later	98 city-pairs 3 years later	98 city-pairs earliest dates	98 city-pairs 3 years later
<b>Economic conditions</b>				
GDP growth (EU27 average 2014- 2030)	Stronger: 2.7%	Moderate: 2.2%	Moderate: 2.2%	Weaker: 1.7%
EU Expansion <sup>6</sup>	+7 States 2015-2025	+8 States 2012-2020	+8 States 2012-2025	+7 States 2014-2025
Free Trade	Global: Most regions	North and Mid Atlantic, Far and Middle East	Neighbours: Former CIS, North Africa	None
<b>Price of travel</b>				
Ticket price trend	Decreasing, slowing down for ESRA	Decreasing, slowing down for ESRA	Decreasing, slowing down for ESRA	Decreasing, slowing down for ESRA
Price of CO <sub>2</sub> in Emission Trading Scheme	Lowest 2012: €25 2030: €25	Lower 2012: €30 2030: €40	Highest 2012: €50 2030: €90	Lower 2012: €30 2030: €55
Price of oil/barrel (in 2008 US\$)	Lowest 2014: \$85 2030: \$90	Lower 2014: \$95 2030: \$125	Highest 2012: \$105 2030: \$180	Highest 2012: \$105 2030: \$180
Increase in other charges	Noise: Medium Security: High	Noise: Low Security: No chg	Noise: High Security: Decrease	Noise: No change Security: High
<b>Structure</b>				
Network	No Change	No change	More hub & spoke	More point-to-point
Fleet (Annual increase in average seats per aircraft)	1.6%	1.2%	1.6%	1.1%

These characteristics referring to the future are often forecasts in itself, either produced by STATFOR within and for the purpose of the long-term traffic forecast or by a third party (e.g. Oxford Economics, Ltd for the GDP growth). The importance of

<sup>6</sup> If political union proves elusive, but some degree of open aviation, free trade and free movement are still achieved, then the forecasted effects on traffic will still be valid.

the various elements for the final forecast traffic is discussed later in the document (see 4.8). Some of the more important ones are:

- **GDP growth** averages 2.2%/year ( $\pm 0.5$  p.p. depending on the scenario) for 2014-2030 in the EU27. It is higher in the new members States catching up with the developed economies in western Europe.
- **Oil price** is between \$90 and \$180 per barrel in 2030 (in 2008 US dollars). Shocks to the fuel price can appear in the short-term but dissipate in the long-term.
- Aviation participates in the **CO<sub>2</sub> Emissions Trading Scheme** from 2012. The allocations are fully auctioned by 2030<sup>7</sup> and the prices are €25-€90 per tonne CO<sub>2</sub> (current contracts for 2012 are at around €28).
- **EU enlargement** brings more economic opportunities for the countries as well as more travel options for their inhabitants. By 2030, all the Balkan States have integrated into the European Union, Turkey has joined in 2 of the 4 scenarios.
- **High-speed rail** continues to develop and substitute for the air travel on short-distances where it can reach comparable travel time and provide sufficient comfort. Close to 100 city-pairs are linked by high-speed rail in 2030.
- There are new types of aircraft in the **fleet** in 2030, which has on average 30-50 more seats per airframe than now; 300-900 very large aircraft with capacity over 500 passengers (A380 or similar) fly Europe.

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<sup>7</sup> This was revised to 2020 in the legislation after the forecast was prepared.

## 4. FORECAST GROWTH IN IFR MOVEMENTS TO 2030

### 4.1 Summary of growth

The forecast is for between 16.5 and 22.1 million IFR movements in the ESRA in 2030, 1.7-2.2 times the traffic in 2007, 18-33 thousand more flights on a typical day in 2030 compared to a similar day in 2007. The overall average growth of 2.2%-3.5% per year is distributed unevenly in time, across regions and flight flows.

The results of the Long-Term Forecast 2008 are that there will be between 16.5 million and 22.1 million IFR (instrument flight rules) flights in Europe in 2030. This is between 1.7 and 2.2 times the number seen in 2007. This doubling of traffic by 2030 means that each year on a typical day more than 1000 extra flights will need to be handled than in the year before. In 2030, the typical number of flights in the European network in one day will be 18,000-33,000 more than it is now.

In growth terms, the traffic will on average increase by 2.2%-3.5% a year. But this growth is not evenly distributed in time, across regions and flight flows. It is stronger in the beginning of the forecast period, slowing down in the later years. There are several reasons for this: increasing maturity of the market, pressure on higher ticket prices (e.g. due to rising oil and CO2 prices), and mainly in the later years the increasing congestion of the airports which are not able to serve the forecast demand.

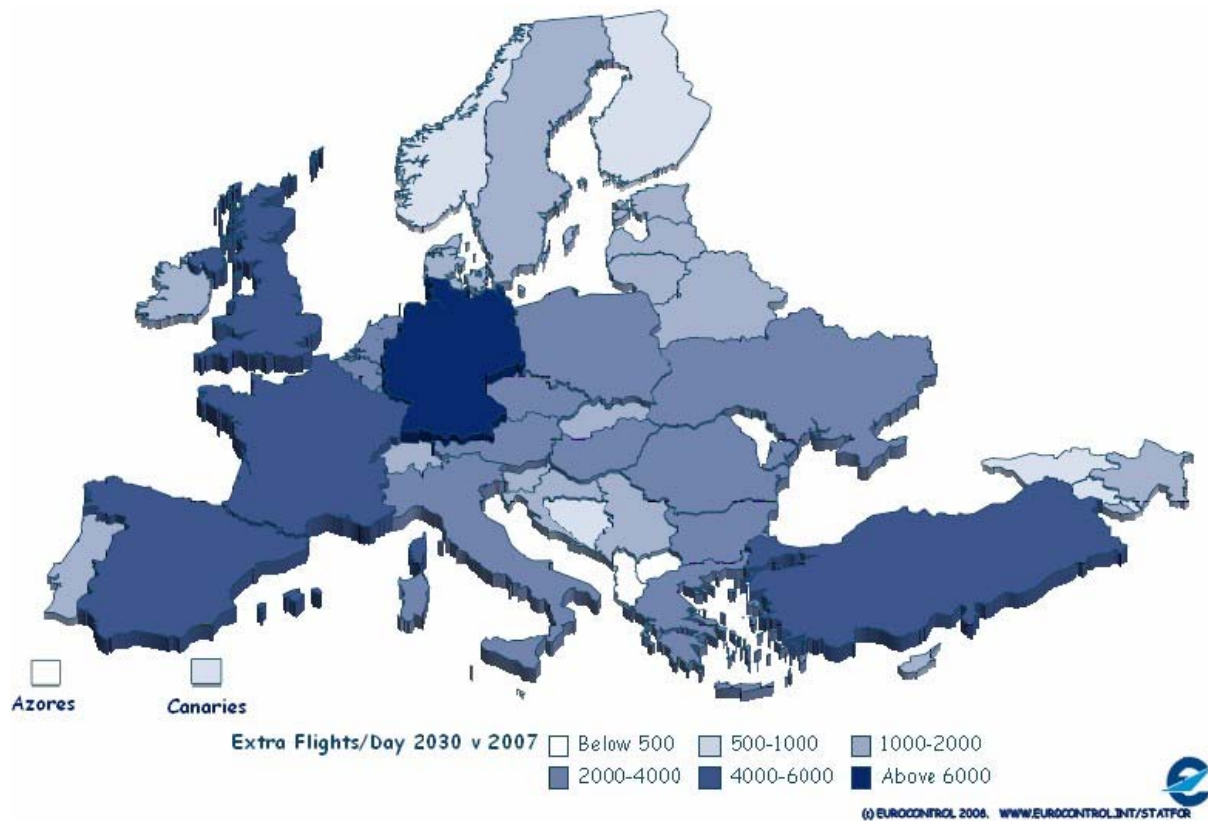
**Figure 7. Summary of the forecast for the ESRA.**

	IFR Movements(000s)						Average Annual Growth						AAGR 2030/ 2007	Traffic Multiple 2030/ 2007
	2006	2007	2014	2020	2025	2030	2006	2007	2014	2020/ 2015	2025/ 2021	2030/ 2026		
A: Global Growth	.	.	14,119	17,532	19,890	22,086	.	.	5.2%	3.8%	2.6%	2.1%	<b>3.5%</b>	<b>2.2</b>
B: Business as Usual	.	.	12,930	15,553	17,763	19,549	.	.	3.9%	3.1%	2.7%	1.9%	<b>3.0%</b>	<b>2.0</b>
C: Regulation & Growth	9,439	9,916	12,930	14,955	16,724	18,170	3.9%	5.1%	3.9%	2.5%	2.3%	1.7%	<b>2.7%</b>	<b>1.8</b>
D: Fragmenting World	.	.	11,773	13,460	15,062	16,507	.	.	2.5%	2.2%	2.3%	1.8%	<b>2.2%</b>	<b>1.7</b>

Geographical distribution of the growth is pictured in Figure 1. It is stronger in Eastern Europe where the air traffic market is relatively less mature and where there is a good potential for further growth as these States are catching up with the Western economies. As a result, Turkey and Poland will join the top 10 busiest States in Europe.

Figure 8 shows the distribution of the extra 18-33 thousand flights per day in 2030. Naturally, it is the bigger airspaces that will see the biggest numbers of additional flights: Germany, followed by France, the UK, Spain and Turkey.

**Figure 8. Extra flights through the airspace per day 2030 v 2007 (C: Regulation & Growth).**

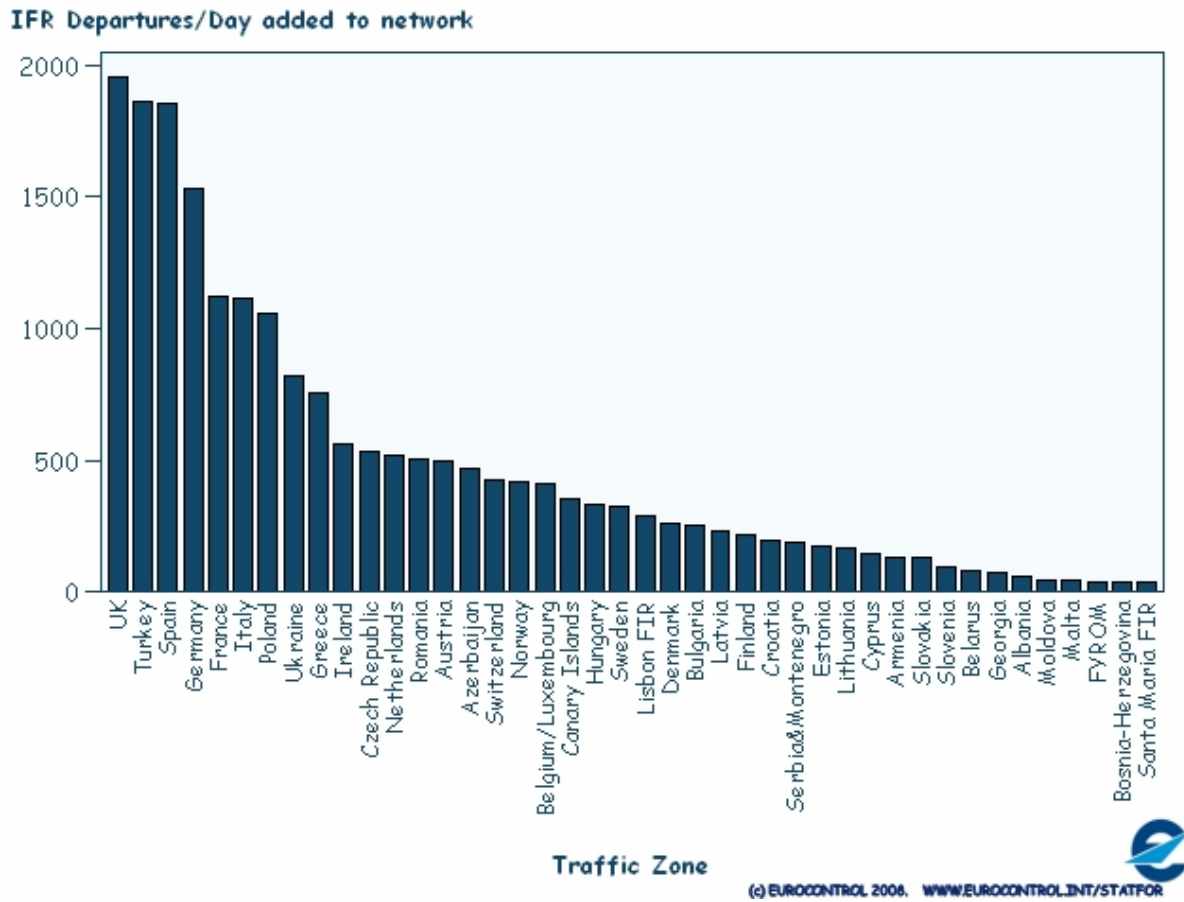


But it is not Germany who will add the most traffic to the network. The UK, Turkey and Spain are those that will see the biggest increase in the numbers of aircraft arriving to and departing from their airports (see Figure 9). That is because the total numbers of flights in an airspace are the aggregate of domestic traffic within the States, arrivals from and departures to other European States or regions outside Europe, and flights crossing Europe without landing here. It is the relative size of these flows and their speed of growth that generates the overall 2.2%-3.5% growth per year.

In ESRA, it is the internal traffic which is the most important in terms of number of movements: almost 80% of all IFR movements were within ESRA in 2007. This share will go down to a little below 70% by 2030, with ESRA internals growing by just 1.7%-2.7% per year depending on the scenario, while the numbers of flights to and from ESRA grow by 3.8%-5.8% (strong in particular for flights to/from the Former CIS Region and Far-East), and flights passing the ESRA airspace without landing here by 5.0%-7.1% (even though these are and will be relatively small in absolute numbers) (Figure 28 in Annex E).

These also vary by State and especially the domestic flights within a State increase with different strength across ESRA region: in most of the Western Europe very little (e.g. Germany, Sweden, France), more in some of the big States in the East (e.g. Poland, Turkey). This again is due to the differences in maturity of the local markets, opportunity to use alternative means of transport such as high-speed rail and local geographical specificities.

Figure 9. Traffic added to the network 2030 v 2007 (C: Regulation & Growth).



## 4.2 Risks to the Forecast

**The long-term forecast uses a set of four scenarios to give structure to the uncertainty about the future developments of air traffic industry. There are a number of other risks not included in the forecast that users should consider when planning for the future.**

With more than 20 years horizon, the forecast is clearly prone to changes in the economical, political or social conditions of the future World. Indeed, the long-term forecast is unlikely to hit the figures that we will experience in twenty years time exactly, but it should help decision-makers by giving a structure to the uncertainty about the future. The four scenarios are created to capture some of the various possibilities with the aim to provide users with a view of what these would mean for the traffic in 2030.

Though the scenarios vary in their specific mix of factors, a number of other elements can present additional risks for the forecast. Some of the main ones recognised for the LTF are listed below. A separate *Vision and challenges* report (Ref. 6) of the *Challenges of Growth 2008* study (CG08) focuses in more detail on some further issues identified by the industry experts as possible risks to the future of air-transport. These are also briefly discussed in section 2.7 of the *Challenges of Growth 2008* report (Ref. 1).

- The forecast for traffic through each State's airspace is based on the simple assumption that the *en route network* remains as in 2007, as do the routes that aircraft follow on that network. In practice, there will be significant changes, particularly in the South East of Europe. Section 3.3 of the Medium-term Forecast (Ref. 7) discusses the sensitivity to this assumption.
- **External events**, such as pandemic, terrorist attacks, wars and natural disasters can all affect air traffic briefly, or for the long-term. The last 20 years have not been quiet ones for aviation. There is no reason to believe the next 20 years will be uneventful. The forecast scenarios aim to capture some of these risks, but lower-growth scenarios could certainly be envisaged.
- Tourism trends and economic growth are in fact **cyclical**, with peaks and troughs of growth (see Figure 4). The long-term forecast will give smooth, rather than cyclical results, which should come to around the same level in 2030.
- Many **local changes** are significant to particular airports, but less significant at the annual, State level for which this forecast is designed. The decision of a carrier to open a new base can mean that a particular airport grows strongly, its neighbouring airports hardly change; and yet the total traffic can be consistent with the forecast for the State.
- **Airport plans** for the developments of their infrastructure are included in the forecast as a condition for serving the increasing demand for flights. These plans may be delayed or may not realize for a number of reasons such as increasingly negative attitude of local communities to airfields' extensions, stricter environmental limits or simply lack of financial resources.
- Low-cost carriers and business aviation have been the major contributors to growth in Europe in the recent years. **New business models** such as air-taxi service are on the verge of becoming drivers of the growth in the future. Current numbers of very light jets (VLJs) flying in Europe are still very low but their integration into the controlled airspace is under active discussion at Eurocontrol and elsewhere. The same is true for unmanned aircraft systems (UAS), that are

at present mainly deployed by the military and normally operate in a segregated airspace or in very low altitudes. Their strong potential for civil use makes it another segment with possible significant effect on future traffic growth. Supersonics or other 'yet unknown' types of aircraft can have an effect which is difficult to estimate beforehand.

- **Climate change** and other environment-related factors will certainly have an impact on the future of aviation not only within the next 20 years but also (and mainly) in the longer-term. Some of the effects on air travel demand and supply (noise, CO<sub>2</sub> emissions) are modeled in the forecast. But there are many more elements for which the scientific evidence may not be currently sufficiently robust but which may become increasingly important within the next years. Some of these are addressed in more detail in sections 2.5 and 2.6 of the CG08 report (Ref. 1).

### 4.3 More demand than capacity

The forecast reviews the capacity of 138 major European airports, twice the number covered in the *Challenges to Growth 2004*. By 2030, these plan to increase their capacity in total by 41% (combining some new airports construction, new runways and other ground- and air-side infrastructure improvements). Nevertheless, the demand in 2030 will exceed the capacity by as much as 7 million flights in the high-growth scenario A: Global Growth. The congested airport system will need to operate very close to its limits, 14-39 airports in 2030 Europe will be operating very much like Heathrow does now.

One of the major challenges identified by the ECAC/EUROCONTROL *Challenges to Growth* study in 2004 (Ref. 8) was the capacity of the airports to accommodate the forecast flights. The study concluded that in the fastest growth scenario (A: Globalisation and Rapid Economic Growth) around 3.7 million IFR flights could not be accommodated by the major European airports in 2025. This result was confirmed two years later in the Long-Term Forecast 2006 where the number of unaccommodated flights was only slightly reduced to 3.4 million (due to some new airport plans).

This year the figures on airport capacity have been fully revised building on results of a survey conducted within the *Challenges of Growth 2008* project (Ref.1). These figures were obtained with the support of ACI-Europe directly from the airport representatives and according to the confidentiality agreement cannot be revealed individually. The approach for modelling the airports capacity is somewhat different from the CG04, technically more similar to the one used in the LTF06. Mainly, CG04 study looked at capacity of the airports in terms of theoretical achievability with the 'best-in-class' as a benchmark for airports with similar runway configuration. This figure was amended if the airport supplied information to the contrary. The 2008 long-term forecast uses a set of figures directly obtained from the airports and hence reflects more the real plans of the airports. There are clearly pros and cons to both of the approaches: the main advantage of the CG04 being the ability to provide estimates also for other similar airports not covered by the survey, the main disadvantage in overestimating the ability of airports to reach the best-in-class levels. This was the principal reason for this LTF to use figures obtained directly from the airports, hence at the levels and in the time as planned by the airports.

In total, data for 138 airports including all of the 50 future major European airports (in terms of traffic in 2030) are used in the forecast to analyse the constraints of the airports. These major airports account for around 70% of the traffic in Europe meaning that the coverage is good enough to give a picture of the European airport system ability to serve the forecast demand. This is also a noticeable improvement in the coverage comparing to the forecast of two years ago and the *Challenges* study of four years ago where information on about half of the airports was used<sup>8</sup>. However, for a more in depth analysis of the overall network capacity and mainly for investigating some of the mitigation options such as shift to alternative airports (Ref. 9) still better information on available capacity of smaller airports would be beneficial.

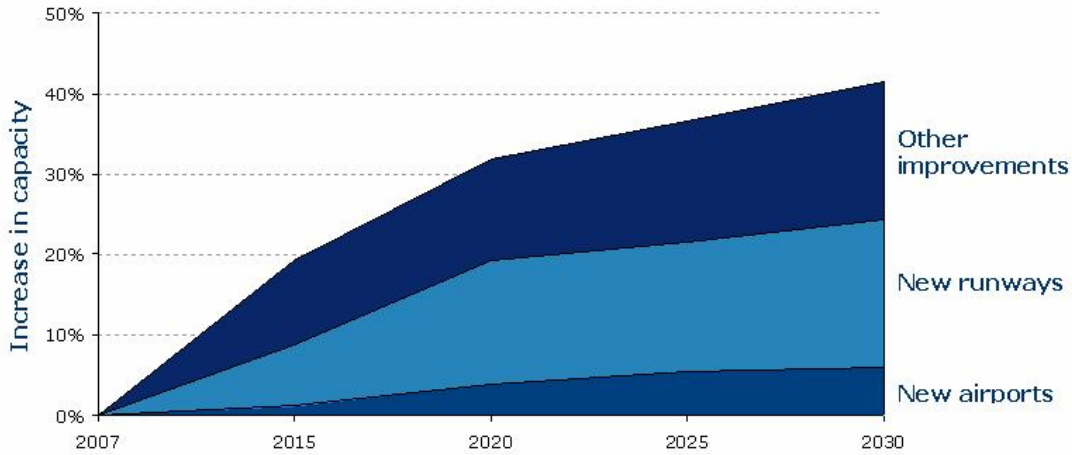
The survey results show that the airports plan for significant investments (Figure 10). The current plans are for at least (there could be more at airports not covered by the survey): 5 new major airports in Europe, new runways at 27 airports and other air-side (taxiways, aprons etc.) and ground-side (terminals etc.) improvements at another

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<sup>8</sup> Only about a third of the airports was used in the LTF06.

79 airports. Only 27 airports reported no current plans to expand capacity. If these plans are carried out, the capacity of the system will increase by 41% by 2030.

**Figure 10: Airports plan for substantial investments in infrastructure improvements**



Although the capacity improvement as described above is quite substantial, the forecast results show that it will not be enough to serve the forecast demand. There will be as many as 7.0 million flights (25%) lost to airport capacity in the high-growth scenario A: Global Growth in 2030, which is the most challenging scenario in terms of the network capacity (Figure 11). This figure is much higher than the one of CG04 and LTF06 but this is mainly because this year's LTF looks five years further into the future.

When comparing the figures of unaccommodated demand in 2025, the situation has improved. Even though the excess in the number of total flights in 2025 is slightly bigger in the most challenging scenario A than it was forecast 2 years ago (3.7 million compared to 3.4 million), the total number of flights that will be accommodated is by 1 million more: 18.9 million in the LTF06 compared to 19.9 million IFR movements in 2025 in the most challenging scenario in LTF08 (section 4.9 gives more on the LTF08 vs. LTF06 comparison, Annex B of the CG08 report on the comparison with CG04).

These results suggest that the airports are taking in the message of the CG04 study and that they adjust their plans better to the expected increase in traffic. However, the variation between the scenarios in the numbers of excess demand over capacity as shown in Figure 11 and the speed by which it increases in the last 5 years of the forecast hint to another important message: once the airports reach levels of traffic close to their capacity limits, the congestion spreads quickly and the number of lost flights grows rapidly. So while it may not be felt very strongly five, ten or even fifteen years from now, it will strike later with a greater intensity if there is not more room found for the increasing demand.

**Figure 11. Capacity shortfall accelerating once airports reach their limits**

	Excess of IFR Flight Demand over Capacity (Movements Millions)											
	A: Global Growth			B: Business as Usual			C: Regulation & Growth			D: Fragmenting World		
	2020	2025	2030	2020	2025	2030	2020	2025	2030	2020	2025	2030
LTF08	1.3	3.7	7.0	0.5	1.6	3.2	0.3	0.9	2.3	0.2	0.4	0.8
LTF06	1.3	3.4	.	1.1	2.3	.	1.1	2.4	.	0.6	1.0	.

Another effect of increasing demand at already congested airports is that these will need to operate at their full capacity several hours a day. The consequences for the ATM, delays, safety etc. are beyond the scope of this traffic forecast but should not be overlooked. Figure 12 illustrates how the growing congestion at the airports will affect on flights. In 2030, several airports in Europe will look similar to London-Heathrow now.

**Figure 12: Airports running at capacity 8hrs/day in 2030**

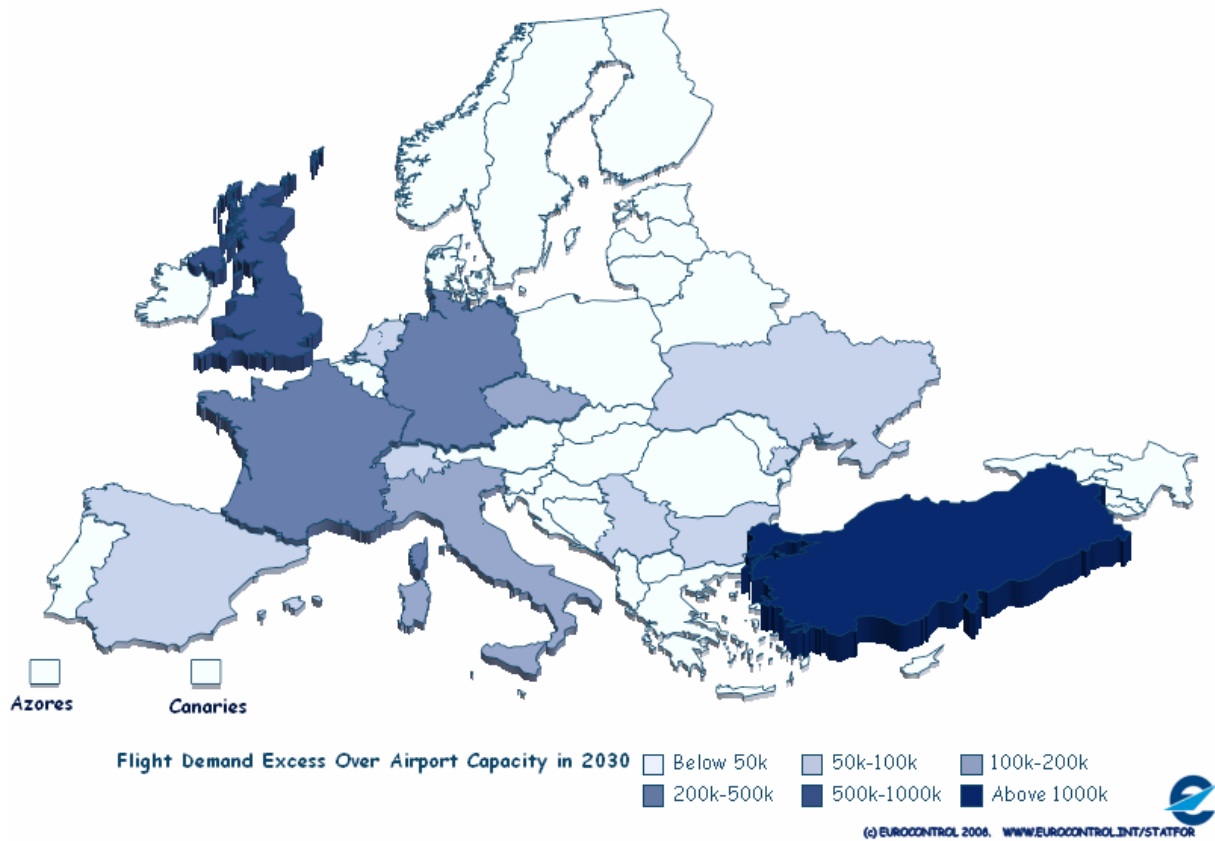
Scenario	Num. Airports	Flights Affected
A. Global Growth	39	70%
B. Business as Usual	25	60%
C. Regulation and Growth	19	50%
D. Fragmenting World	14	43%

Capacity of airports is naturally a local issue and the shortfall is not evenly distributed across Europe; in some regions it will be felt more strongly than in others. Figure 13 shows that airports in Turkey, the UK, France and Germany will loose the highest number of departures and arrivals in 2030 unless they further expedite their plans for infrastructure or operational improvements.

In practice, some of this unaccommodated demand can be satisfied by mitigation methods such as use of secondary airports or shifts to earlier morning or later evening hours. These methods are further explored in the *Challenges of Growth 2008* report (Ref. 1). In this respect the long-term forecast provides an upper estimate of the unaccommodated demand.

On the other hand, the future capacity figures of the airports assume that the planned projects will be finished as currently foreseen. The status of the projects greatly varies - from constructions works already underway to preparatory discussions of airports officials with governments and local authorities – and their finalisation and effect on ultimate capacity figures is not always certain. The LTF clearly strives to cover all the improvements that are currently planned but some of the very open-ended are intentionally not included (e.g. new airport near Bucarest).

**Figure 13. Capacity shortfall is stronger in some regions (C: Regulation & Growth).**



To check the assertion that the capacity of the airports is now likely to be better distributed than foreseen 4 years ago, the capacity figures of CG04 were re-used to assess the effect on the figures of forecast traffic and excess demand in 2030. These show that in the high-growth scenario A: Global Growth, there would be only 21.5 million IFR movements in ESRA in 2030, that is 0.6 million more flights lost to the lack of capacity than it is forecast now.

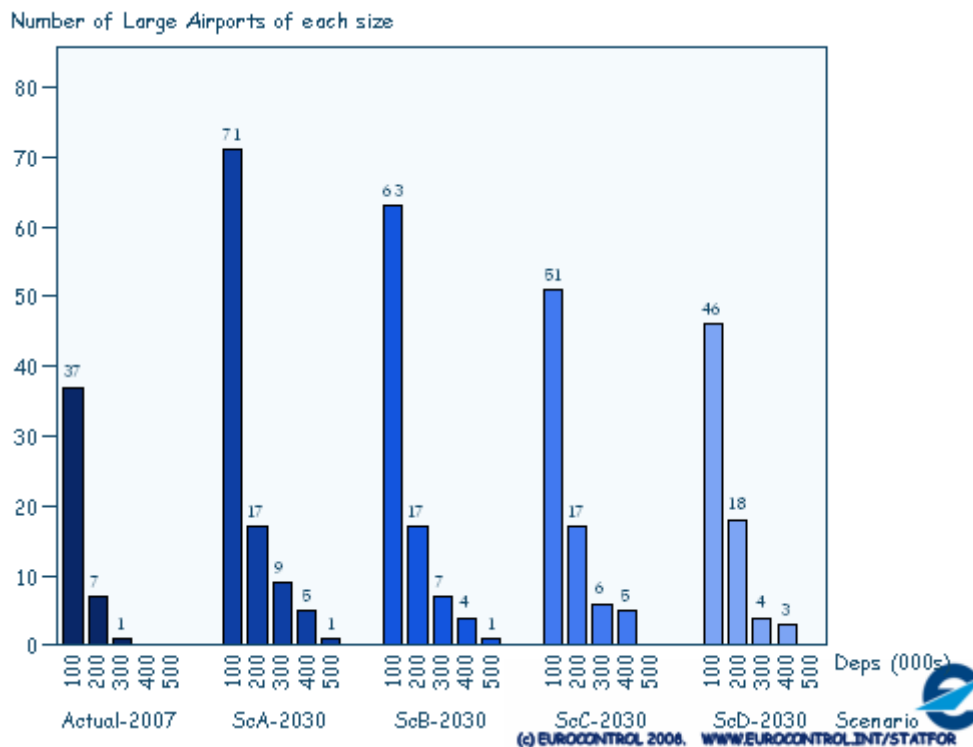
#### 4.4 Airport growth

Even with airport capacity restrictions, there will be an increasing number of large airports. In 2007, there was 1 airport in Europe with more than 250,000 departures: Paris/Charles de Gaulle. In 2030, there will be between 7 and 15 airports of this size.

Figure 14 shows the numbers of large airports in Europe, in 2007 and the forecast for 2030. For example, there were 37 airports with between 50,000 and 150,000 IFR departures in 2007 and just 1 airport larger than 250,000 departures: Paris/Charles de Gaulle. The growth of the largest airports is limited by airport capacity (see 4.3), nevertheless the figure shows that there will be between 7 (in Scenario D) and 15 (in Scenario A) airports of this size by 2030.

The top 10 European airports will handle 1.5-1.9 times more departures in 2030 than they did in 2007. But it is not only these biggest airports that will increase the traffic. Regional and secondary airports will also contribute to the forecasted growth and therefore the share of these biggest airports will remain roughly stable, between 22-24% in comparison with the current 23% share on total ESRA departures. Again, without the capacity constraints these airports would increase their share slightly to 23-26%.

**Figure 14. In 2030 there will be up to 32 airports as big as the top 8 in 2007.**  
(Upper and lower bounds for the numbers of departures in the columns are  $\pm 50,000$ .)



It is the combination of forecast growth in demand with the plans of the airports for capacity improvements and thus the ability to serve this increasing demand that determines the numbers of extra departures and arrivals handled by the airports. A number of airports in Eastern Europe will see significant growth by 2030 and are likely to outnumber (in terms of the departures) some of the current busiest airports.

## 4.5 A shift to longer-haul

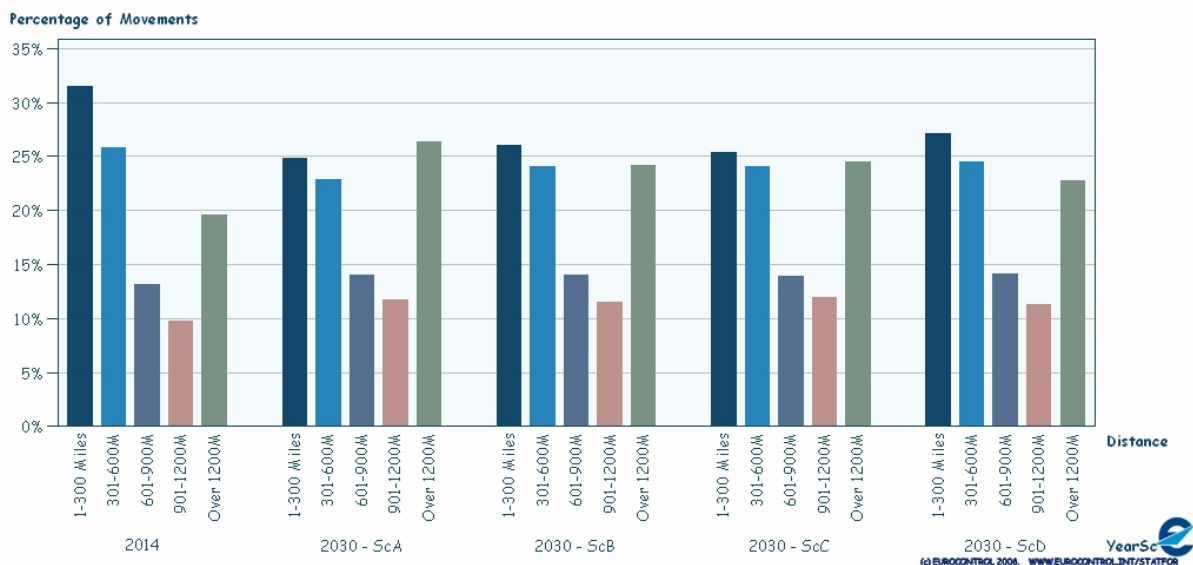
**Stronger economic growth outside Europe will drive the shift to longer-haul flights in all four scenarios. Open economic policies and air travel liberalisation will create the greatest preference for long-haul in scenario A: Global Growth but also in scenario D: Fragmenting World the economic development and higher maturity of the ESRA domestic market will outweigh the built in factors for short-haul travel preferences.**

Figure 15 shows the development between 2014 and 2030 in average distance flown (percentage of movements per distance category). In 2014, the values are the same in all scenarios because the Medium-Term Forecast does not alter these proportions significantly between its three scenarios. In 2030, there is a shift to longer-haul in all 4 scenarios: the share of flights above 1200 miles will increase from 20% to 23%-26%, whereas the short flights below 300 miles will represent only 25%-27% in 2030, that is by 5-7% less than in 2014.

This shift is the strongest in scenario A (Global Growth) where open economic policies and air travel liberalisation support the preference of long-haul travel. But also in all the other scenarios the flights below 600 miles will lose share to longer flights, including scenario D: Fragmenting World which includes factors for shorter-haul preference (because of global insecurity).

There are several reasons for this shift: the economic growth in regions other than the traditional ESRA States (e.g. Far-East, North- and South-Africa, Former CIS Region) is forecast to be stronger pushing for more flights connecting these regions with Europe, also the maturity of these markets is lower than of the traditional West-European economies so the effect of this economical growth on demand for flights will be stronger. On the other hand, the relatively slower growth in ESRA internal and domestic traffic within the ESRA States pushes for lower share of short-haul traffic in 2030. Once again it is the market maturity which is one of the major factors for this development. The market for domestic air-traffic seems to be closing saturation in many of the big Western economies. Moreover, the improving network of high-speed rail described in more detail in section 4.7 will attract more passengers travelling short distance.

**Figure 15. Shift to longer-haul in all scenarios.**



**4.6 Average aircraft size continues to grow**

**To arrive to the number of flights from the forecast growth in passenger demand, the long-term forecast model uses assumptions about the future fleet structure and its use.**

Historically, over decades and in recent years too, the number of passengers has grown faster than the number of flights. This is because the average number of seats per airframe has grown (typically by 1% per year) and airlines have improved their efficiency in achieving higher load factors. As the fleet renews, new aircraft types are put into operation. These are usually bigger in terms of seat capacity than before (even though there are also some new aircraft types which are much smaller than the ones mostly flying now, typical example being the VLJs).

The mix of future aircraft sizes and their use for different flight distance for each of the LTF scenarios results in the growth of average size of aircraft as shown in Figure 16. The change in the average number of seats per movement is the biggest in scenario A: Global Growth and C: Regulation & Growth: about 1.4% per year. In scenario A: Global Growth it is the technology enhancements that allow the use of even larger aircraft; in scenario C: Regulation & Growth it is mainly the environmental concerns that put more pressure on reducing number of flights while transporting the same number of passengers which is only achievable by increasing the number of seats in use per aircraft. Also in the other two scenarios (B and D) the average size of aircraft will grow by approximately 1% per year.

The fleet that will fly Europe in 2030 is expected to have on average 25%-35% more seats per airframe than today. The recently introduced very large aircraft with passenger capacity over 500 (e.g. A380) will naturally greatly contribute to this growth. The forecast foresees between 300 and 800 of these very large aircraft to fly Europe in 2030. These figures are broadly consistent with Airbus<sup>9</sup> and Boeing<sup>10</sup> forecast which estimate together some 400 airframes of this size for European carriers in 2026.

**Figure 16. In all scenarios, the number of seats on each flight continues to grow.**

	Scenario			
	A: Global Growth	B: Business as Usual	C: Regulation & Growth	D: Fragmenting World
Annual Change in Seats/Movement	1.4%	1.1%	1.4%	1.0%

<sup>9</sup> Global Market Forecast 2007-2026, p.78, Airbus

<sup>10</sup> Current Market Outlook 2007, p.45, Boeing

## 4.7 High-Speed Trains

**The competition of the high-speed train and the development of the rail network will reduce the passenger demand by 0.3-0.5 million flights in 2030. This shift to rail will free some of the capacity of the airports and reduce the excess demand on specific airport pairs.**

Similarly as the air traffic network, the European high-speed train network will see some significant developments in the near as well as more distant future. There are projects for several upgrades of existing train connections to high-speed train lines and for improving the rail connectivity between major European cities. The LTF08 looks at these plans<sup>11</sup> and models the future high-speed rail network to assess the competition<sup>12</sup> that it creates to air transport in attracting passengers travelling shorter distances.

The improved rail connectivity brings the destinations 'closer' in sense of reducing the time of travel. The speed advantage of flying diminishes and the other factors such as comfort of travel, distance to the city centre, security hassle, risk of delay etc. may shift passengers' preferences towards trains.

A schematic view of the high-speed train network as used in the forecast is pictured in Figure 19. There will be close to 100 city pairs linked by high-speed rail by 2030. The main projects cover further improvements in the Spanish and French network with better international connections; extension of the lines to Portugal; tunnels construction for the trans-Alpine lines connecting Switzerland and Italy; some stretches in Germany reaching to Austria; lines from Sweden to Denmark and in Turkey.

The possibility to travel by train is expected to reduce passenger demand for flying by around 0.3-0.5 million flights in 2030. Figure 17 shows where this reduction will mainly take place (for scenario A: Global Growth as an example). These are mostly the same regions as mentioned in the above list of projects. The flights that will be affected are only those short-haul flights within Europe for which the train can be time-competitive (up to around 500km). In absolute figures, the reduction will be the biggest for demand on departures from Spain: around 180,000 departures, which is about 7% of the total demand in Spain. But the reduction will be relatively big also in Portugal and Sweden, with around 10% and 8% reduction in demand on departures respectively.

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<sup>11</sup> <http://www.uic.asso.fr/>, and elsewhere

<sup>12</sup> In the LTF, HST is only modeled as a factor reducing the demand for air travel. In reality, there is evidence of possible synergies of train and air transport. New business models of partnerships between air and train operators have emerged (e.g. Air France + TGV), many airports improve their connectivity with the train network in order to make getting to the airport faster and easier so they can bring passengers from more distant areas. At the same time the local air quality can be improved by reducing the need for car transport to the airports. This should in theory have positive effect on air travel demand. The strength of this effect is however not yet clear enough to be modeled explicitly and is assumed to be included in the underlying growth trend.

**Figure 17. Effect of high-speed train: reduction in passenger demand for IFR departures from airports in each traffic zone.**

		Change in IFR departures (000s)			Percentage Change		
		2020	2025	2030	2020	2025	2030
A: Global Growth	Austria	.	1	1	.	0.2%	0.2%
	Belgium/Luxembourg	.	1	1	.	0.3%	0.2%
	Denmark	10	11	13	3.3%	3.2%	3.0%
	France	16	62	68	1.0%	3.2%	3.0%
	Germany	12	23	31	0.6%	1.0%	1.2%
	Italy	30	39	41	2.1%	2.3%	2.1%
	Lisbon FIR	25	31	36	10.1%	10.0%	9.9%
	Netherlands	2	2	2	0.4%	0.3%	0.3%
	Spain	120	157	183	6.9%	7.4%	7.3%
	Sweden	34	38	42	8.7%	8.4%	8.1%
	Switzerland	.	5	5	.	0.9%	0.8%
	Turkey	27	40	56	2.7%	2.7%	2.6%

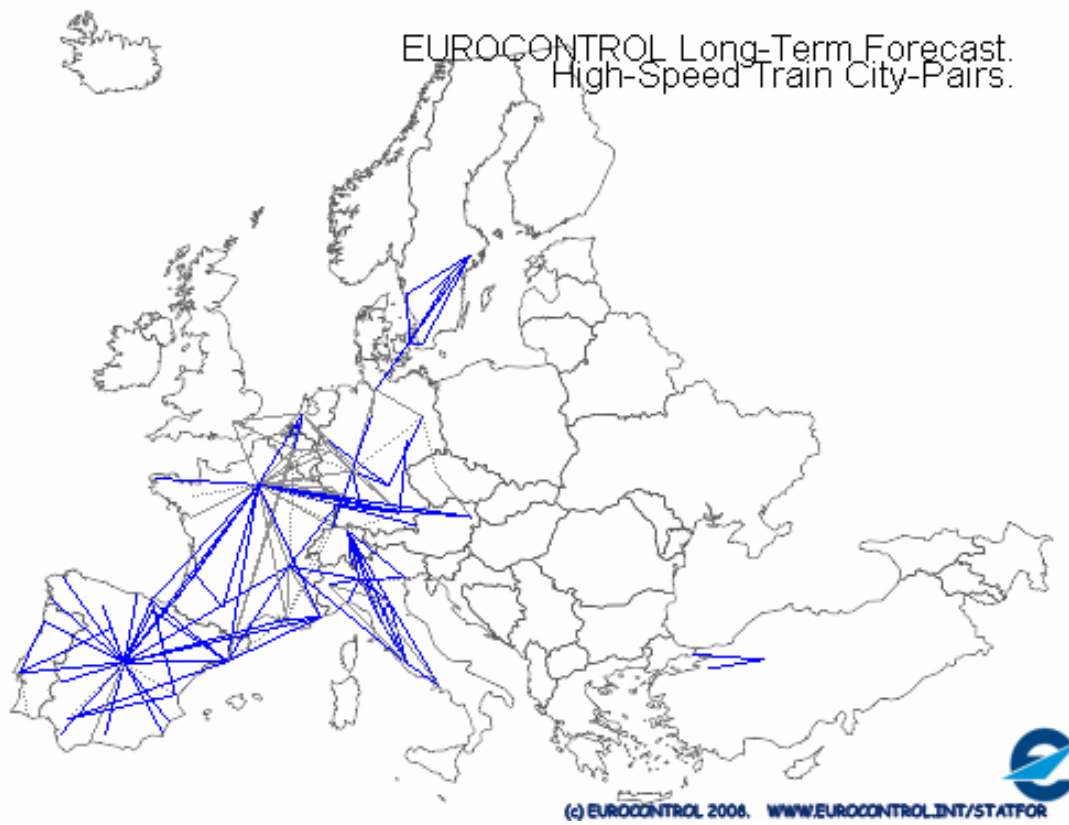
The high-speed rail network is developed to facilitate transport between the major European cities. The airports in these are often faced with levels of passenger demand nearing their capacity limits. In many cases the forecast is that they will not be able to serve all the demand in 2030 (for more on the airport capacity see section 4.3). The passenger shift to trains can free some of the airport capacity and it can be used for longer-haul flights or, in general, flights to destinations not connected by HST. But in many cases, it will only reduce the level of excess demand because the airports will be running at their maximum anyway.

In result, the reduction in passenger demand due to shift to high-speed trains is translated (after applying the airport capacity) into a reduction of less than 0.3 million flights in all four scenarios, which is less than or close to 1% of forecast traffic in the ESRA in 2030 (see Figure 18).

**Figure 18. Effect of high-speed train network improvements on total IFR traffic constrained by airport capacity.**

	Change in IFR Movements (000s)		
	2020	2025	2030
A: Global Growth	169	190	93
B: Business As Usual	210	192	176
C: Regulation & Growth	220	235	205
D: Fragmenting World	194	221	225

**Figure 19. High-speed train links in 2030 (schematic view of city pairs)**



## 4.8 Importance of different growth factors

**The forecast model combines several factors with different effects in terms of strength and direction on the future traffic growth. The 'economy'-related factors play the dominant upward-pushing role, reduced mainly by the 'market structure' and airport capacity.**

The various factors entering the forecast model as described in Figure 24 in Annex B have each different impact on the forecast future traffic growth in terms of both, strength and direction. To understand the relative importance of the factors, Figure 20 illustrates how the input assumptions impact on the forecast traffic growth.

The figure presents a mix of the factors (bars in the graph) and shows schematically how these shift up or down the forecast growth in the number of passengers and movements (the dashes in the graph). The graph provides a simplified step-by-step picture of the direction and relative size of the shifts, rather than the precise values. In reality, the forecast model is much more complex with possible interactions between the factors, irregular time patterns and supplementary network effects. It is the mix of these that produces the final forecast and the reason why neither of them can be treated separately as for simplicity suggested by the graph. Only the forecast of passenger flights is portrayed in Figure 20; all-cargo, GAT military, business jet flights and infrequently-flown airport pairs are modelled explicitly with a simplified approach (see Annex B).

The long-term forecast method derives the growth in flights from the growth in passenger numbers. The passenger demand for air-transport is assumed to be closely related to **Economy** developments represented in the method by GDP growth. This can be boosted by new or extended free trade agreements or EU expansion and is converted into the passenger growth using a GDP multiplier, reflecting the maturity of the air-transport market in the respective region. GDP growth of 3% per annum boosted by extra 0.8% per annum due to a new free trade agreement results in somewhat less than 6% growth in passenger demand.

It is not only the changes in global economic conditions that influence the passengers' decisions to travel by air. An increase in the disposable income (represented by the GDP growth) and hence more money to spend on travel can be contradicted by equal or faster increase in **Price** of travel. There are several contributors to the evolution of fares: continuously decreasing trend in the air-ticket price is lifted by noise and security charges added to the cost, additional expenses of the airlines related to CO<sub>2</sub> emissions and oil price are passed onto the customers by increased fares. Naturally, changes in prices have inverse effect on the demand (higher price => less demand) determined by the price elasticity.

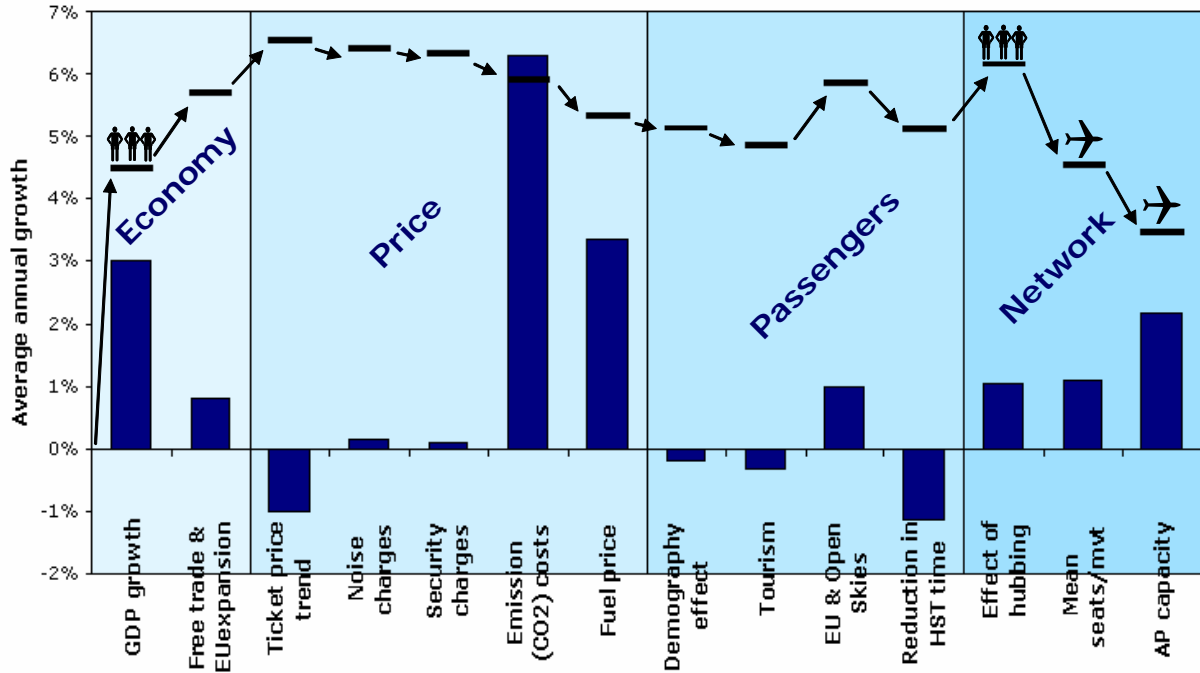
A decision to take a plane is of course not a result of the mere possibility to do so (even though one may argue that the strong growth of low-cost carriers proves the opposite). Leisure and business **Passengers** decide where and how they want to travel. Aging of population as well as changing tourism preferences can reduce the flight demand in some regions, EU expansion or Open Skies agreements can facilitate air-transport and encourage demand in others. Alternative means of transport such as high-speed rail may drag over some of the travellers if fast enough and providing comparable comfort. Travelling from one point to another may require taking several flights with a stronger hubbing system.

Demand in terms of number of passengers is converted into the number of flights using an assumption about the **Market Structure**, that is the structure of the fleet and use of aircraft. The expected increase in the mean size of aircraft coupled with

increasing load factors reduces the growth, so the growth in flights is significantly less than in passenger numbers.

The airports' ability to serve the flights is represented by the **Airport Capacity** figures. Though the overall capacity of the system increases, it may not always be at the right place, right time or simply enough to allow for the growth in traffic as demanded.

**Figure 20. Mix of factors pushing the passenger demand and forecast growth in traffic (schematic example).**



## 4.9 Comparison with previous forecast

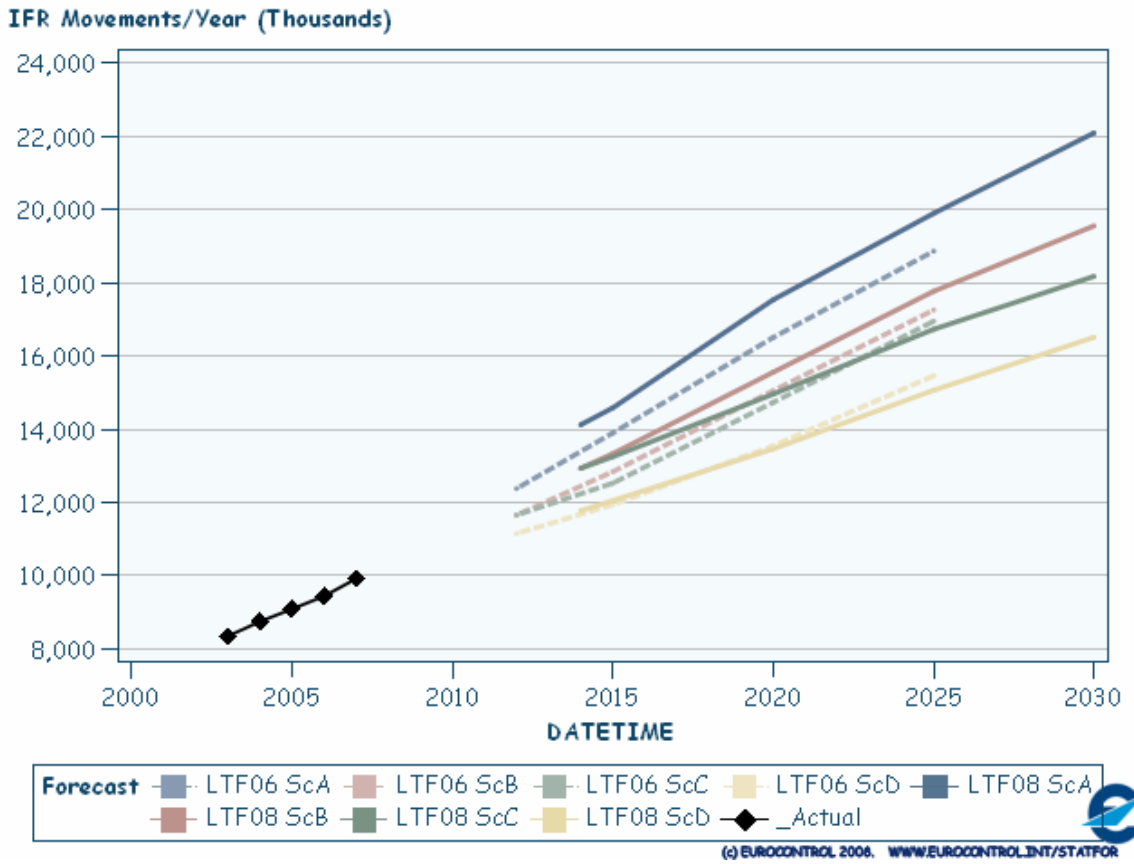
**The new long-term forecast has more variation than the previous one. The uncertainty about future developments is included in the scenario storylines.**

The last long-term forecast was published in 2006 (Ref. 2). It looked into the future of air traffic in Europe up to 2025. This year, the horizon of the forecast is extended by further 5 years: to 2030. In 2008, new medium term forecast was published (Ref. 7) and it is used as the baseline for this LTF08. The scenario assumptions for the LTF08 have been updated and scenario C: Growth and Regulation has been redefined to focus more on the environmental challenges and constraints (the scenarios are described in section 3). The airport capacity figures have been revised within the *Challenges of Growth 2008* project (see 4.3) and the forecast model has been changed in some parts (see Annex B).

All of these effects combined explain the differences from the previous forecast as compared in Figure 21.

- The LTF08 baseline in 2014 is higher than it was forecast in 2006. This is the result of the MTF08 forecasting higher growth partly due to growing importance of business jet flights and the effect of the EU-US Open Skies agreements. This relatively high starting point for the LTF08 could be questioned given the recent developments in the air industry related to fluctuation in fuel cost, financing difficulties of the airlines and the general economic down-turn. The latest short-term forecast update (Ref. 10) revised the expected numbers of flights downward and foresees the traffic growth to further slow down in 2009. But as shown in Figure 4, though the traffic growth can drop down sharply in the short-term, it tends to recover in the long-term.
- The forecast traffic for 2020 and 2025 is higher in two of the three comparable scenarios A: Global Growth and B: Business as Usual, it is lower in the third one D: Fragmenting World. For scenarios A and B this is mainly due to the higher baseline in 2014, because the growth rates in 2014-2025 of LTF08 and LTF06 are very close. The traffic growth in scenario D is now lower than forecast two years ago mainly due to expected faster growth in the size of aircraft (see 4.6) and higher maturity of ESRA domestic markets.
- The storyline of scenario C: Growth and Regulation has been altered more substantially and the mix of input assumptions is now different in many respects from two years ago: lower GDP growth, higher ticket prices, bigger aircraft etc. In result, the forecast traffic growth in scenario C is much slower in the LTF08 and though starting higher, the number of flights forecast for 2025 is smaller than in the LTF06.
- The flights flow pattern is somewhat different from two years ago with a stronger shift from short-haul to medium- and long-haul flights. Though the overall rate of growth in scenarios A and B is quite similar, the growth in domestic and ESRA internal flights is now forecast lower, while the arrivals/departures and overflights grow faster.

**Figure 21. LTF08 starts higher than LTF06 but grows more slowly in two out of the four scenarios.**



## 5. GLOSSARY

AAGR	Average Annual Growth Rate
ACARE	Advisory Council for Aeronautics Research in Europe
ACC	Area Control Centre
AEA	Association of European Airlines
CFMU	Eurocontrol Central Flow Management Unit
CG04	Challenges to Growth 2004 Study
CG08	Challenges of Growth 2008 Study
Constrained	Forecast constrained by capacity limits at major airports
CONSAVE	Constrained Scenarios on Aviation and Emissions programme
CRCO	Eurocontrol Central Route Charges Office
ESRA	Eurocontrol Statistical Reference Area (see Annex C)
ETS	European Union Greenhouse Gas Emission Trading Scheme
FIR	Flight Information Region
GDP	Gross domestic product
HST	High-speed train
IFR	Instrument flight rules
IPCC	Intergovernmental Panel on Climate Change
LTF	Long-Term Forecast
MTF	Medium-Term Forecast
ScA	(in tables) Scenario A
STATFOR	Eurocontrol Statistics and Forecast Service
STF	Short-Term Forecast
TR	Traffic Region (a grouping of TZs)
TZ	Traffic Zone (≈State, except for Spain, Portugal, Belgium and Luxembourg, Serbia and Montenegro)
UIR	Upper Flight Information Region

Detailed explanations of the above terms and others are available in EUROCONTROL Glossary for Flight Statistics & Forecasts (Ref.11).

## **ANNEX A. SENSITIVITY TESTS**

**Another way of looking at the importance of the forecast factors is running a sensitivity test to show how the results change when the assumptions are modified. This annex discusses some hypothetical cases.**

### **Oil price**

The price of oil is certainly one of the major elements in airlines' costs and is often quoted as one of the main risks in the future of the air transport. Particularly with the rather dynamic developments that we have seen this year: the fuel price first doubling and later coming back again by a third. Many airlines experienced problems with their cash flow management and hedging strategies.

In the LTF08 the fuel price assumptions are based on the original CONSAVE study, where the price of oil in 2050 was expected to be two times, four times or eight times the prices in 1990. In the LTF08 this trend (taking into account the current market prices) is translated into prices of between \$90 and \$180 per barrel of oil in 2030 (see Figure 6).

To assess the risks of this assumption a 'what-if' option with the growth in oil prices being double the original CONSAVE figures has been produced. In this 'what-if' the oil prices in 2030 are between \$125 and \$260 per barrel (depending on the scenario).

In the LTF model, the additional fuel costs of the airlines are expected to be partly transferred onto the passengers via an increase in the fares which should have a dampening effect on passenger demand and the forecast number of flights. This twice as strong growth in oil price would decrease passenger demand in Europe by some 1 million departures in 2030 in all of the scenarios (see Figure 23), fairly evenly distributed across the regions.

Because some of this demand could not be accommodated anyway due to airport capacity limits, the reduction in flights is smaller – between 0.3 and 0.8 million departures depending on the scenario, with the biggest reduction in the least-challenging and least-congested scenario D: Fragmenting World, and the lowest reduction in the most-challenging most-congested scenario A: Global Growth. This reduction is also not any more distributed evenly but is the biggest in regions with the least capacity shortfall and the lowest in the most congested regions (see Figure 13).

### **Fleet structure**

Section 4.6 explains the assumptions about the future fleet development used in the LTF08. This 'what-if' looks at the extreme option of flying the same aircraft in 2030 as today. More precisely, it assumes that there will be no change in the size of the aircraft and its use for different flight distance. This is a theoretical option aimed at analysing the effects of increasing the size of aircraft. It by no means suggests that in 2030 the average age will be 30+ years for airframes flying over Europe (with all the consequences for safety, environment, fuel consumption etc.).

There is an important element when looking at the size of the aircraft and that is the distance of the flight. Bigger airframes are usually used for longer-haul traffic than for short-haul. As explained in section 4.5, there is a general shift to longer-haul flights in the LTF08. This by itself means that even without manufacturers producing bigger airframes and airlines adding more seats on their flights, the number of seats per movement would increase on average by 0.2%-0.4% per year. As a result, the fleet

flying Europe in 2030 would have on average 6%-11% more seats per airframe than now because it would consist of more of the current bigger aircraft types than now. If this fleet was to serve the forecast passenger demand, the number of departures in the ESRA in 2030 would need to be by 2.4 to 4.9 million higher (see Figure 23).

### **Emission Trading Scheme**

In the production of the LTF08, there was more attention paid to the environmental factors than previously (LTF06 and earlier forecasts). This was mainly concentrated on the CO<sub>2</sub> emissions and the air industry participation in the Emission Trading Scheme (ETS). The assumptions for the LTF08 are summarised in section 3.

Following the latest developments of the ETS legislation discussed in the European Commission and the Parliament, it now seems that the 100% auctioning of the allocations could be introduced sooner than modelled in the LTF08. Therefore a 'what-if' option with 100% auctioning from 2020 has been tested. For simplicity, we do not change the assumption about the price of CO<sub>2</sub> in the beginning and end of the forecast period (see Figure 6). As a consequence, neither the costs for the airlines nor for the passengers change in 2030. (Similarly as for the fuel, the LTF model expects the airlines to transfer the additional CO<sub>2</sub> costs onto the passengers.) What changes is the evolution of costs in time. Airlines will need to buy sooner and more of the allocations directly on the market. Therefore the growth in costs and growth in fares is faster up to 2020, slowing down for the later years up to 2030.

The above explained alteration in the timing of allocation auctioning has a rather marginal effect on the forecast number of flights. The faster increase in fares would somewhat reduce the passenger demand in the early years of the forecast (by around 0.1 million departures in 2020 in all 4 scenarios) but the demand would catch up later and finish at around the same levels as forecast by the LTF08 in 2030.

Another 'what-if' option is the 'no ETS' variant. This assumes zero CO<sub>2</sub> costs for aviation industry during the whole forecast horizon. This is another theoretical option rather than a realistic possibility for the future which has been produced with the aim to understand the ETS effects on the forecast number of flights. It is beyond the scope of this LTF to examine the effects of the ETS and the air industry participation in it in terms of CO<sub>2</sub> emission reduction.

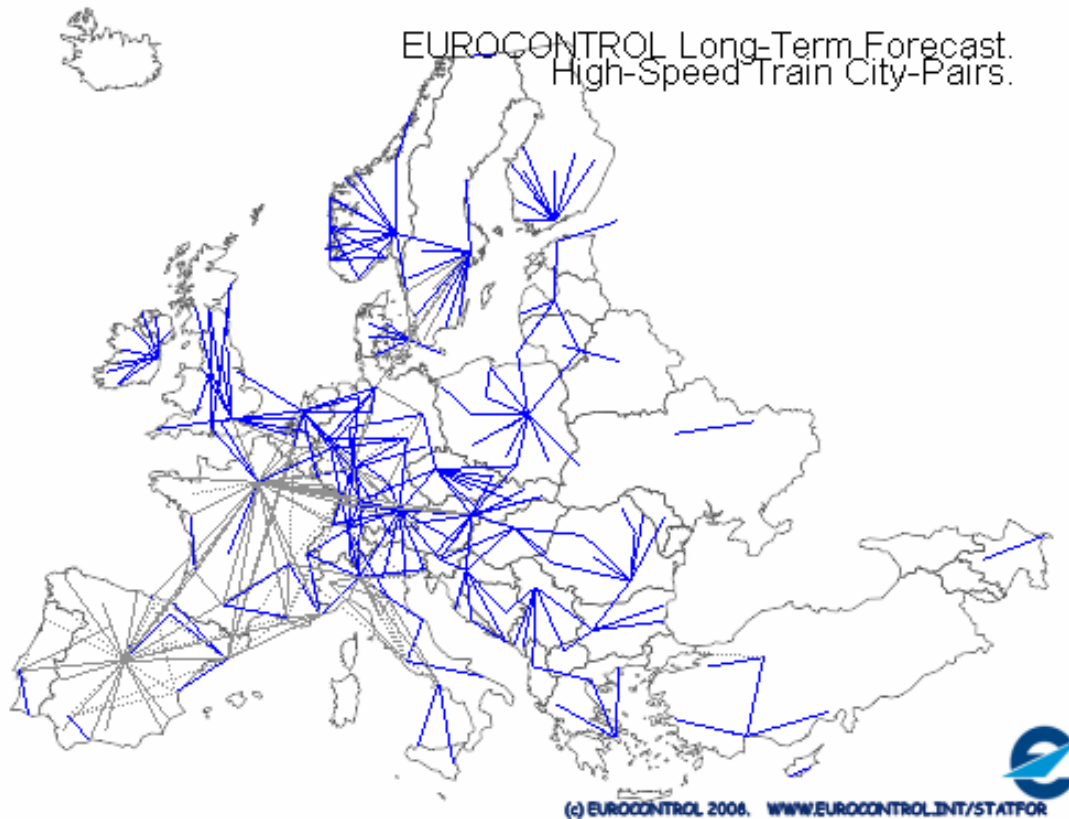
Zero CO<sub>2</sub> costs and hence no environmental charges included in the fares would increase the passenger demand by around 1 million departures in the ESRA in 2030. But as discussed many times before, large part of the additional demand can not be served by the already saturated airports and therefore the final effect would be between 0.3 and 0.7 million IFR movements more in ESRA in 2030 than in the LTF08 (the lowest increase in the most-congested scenario A: Global Growth, the highest increase in the least-congested scenario D: Fragmenting World). The unaccommodated demand would increase by 0.3 to 0.8 million movements.

### **High-speed rail**

The high-speed train network considered in the long-term forecast is based on available information about the existing or planned projects (section 4.7). The horizon of 23 years gives room to considerations about developments other than those currently foreseen. These could for example result from an increased pressure for high-speed rail construction on short busy routes to address the environmental concerns related to air travel. To illustrate the results on air traffic, this has been modelled as a 'what if' option: the network has been extended to connect further 205 city pairs within 400 km air distance (up to approx. 600km ground distance) with more

than 10 flights/day forecast in 2030. The map of all the links is shown in Figure 22. The gray lines show the network as used in the LTF08, the blue lines are the additional theoretical links.

**Figure 22. Theoretical high-speed rail network connecting all short busy routes.**



This additional substantial investment into the high-speed rail network that has approximately three times as many links than what is foreseen in the LTF08 would reduce the passenger demand on air travel (due to shift to time-competitive train connections) by further 0.3-0.5 million flights in 2030. The effect would of course be the strongest in regions where there is currently no or little high-speed rail: in Eastern Europe, the Scandinavia or the UK and Ireland. As explained in section 4.7, due to airport capacity limits the final reduction in the number of flights in the ESRA would be smaller, 0.1-0.2 million flights, with the rest of the passenger shift to trains resulting in decrease of excess demand at the airports.

### **Ticket price trend**

The passenger demand for flying is amongst other things driven by the price of the tickets. With still increasing share of low-cost carriers and pressure on airlines to reduce fares the LTF08 assumes a declining trend in ticket price. However, this assumption has been questioned repeatedly in the preparatory phase of the LTF in view of the possible saturation of the low-cost market. Therefore this 'what-if' looks at the forecast under the assumption of a flat trend in ticket price (before inclusion of the other costs).

It is not only the trend that enters the 'price' component of the LTF model. Other costs of the airlines related to price of oil, CO<sub>2</sub> emissions, noise and security charges are transferred onto the passengers through increased fares. In result, in this 'what-if' the

final cost of flying for the passenger is increasing and therefore the demand is lower: by between 2.2 and 3.4 million departures in 2030 (see Figure 23).

### Demography

The demography component of the LTF model looks at the age structure of the population and combines this with the age structure of air passengers. The outlook for most of the countries in Europe is aging of their population. Apart from social and economical effects (later retirement, pressure on social benefit systems, etc.), this is expected to have also an effect on the demand for flying.

How this shift in population structure and passenger age structure affects the forecast is tested by a 'what-if' fixing the population and passenger age distribution at current levels. With the same demographic structure and the same age structure of passengers in 2030 as we have now in Europe, the passenger demand would be by 0.4-1.4 million departures higher.

**Figure 23: Effect of 'what-if' options on passenger demand for departures in ESRA in 2030 (million)**

What-if	A: Global Growth	B: Business as Usual	C: Regulation & Growth	D: Fragmenting World
<b>LTF08 demand for <u>departures</u></b>	<b>23.6</b>	<b>18.9</b>	<b>16.8</b>	<b>14.5</b>
Double growth of oil price	-1.1	-1.1	-1.2	-1.0
Current fleet	+4.9	+3.2	+3.9	+2.4
ETS full auctioning from 2020	+0.4	+0.1	+0.0	+0.2
No ETS (zero CO <sub>2</sub> costs)	+1.0	+0.8	+1.3	+1.0
HST all links 400km, 10mvts/day	-0.5	-0.3	-0.3	-0.3
Flat ticket price trend	-3.4	-2.9	-2.7	-2.2
No aging population	+1.4	+1.4	+0.4	+1.0

## ANNEX B. FORECAST METHOD

The LTF method grows the baseline airport-pair traffic using a model of economic and industry developments. The model combines factors related to passengers, economy, price, network, market structure and airport capacity.

Figure 24 illustrates the overall structure of the model used to produce the LTF. There are six main groups of factors in the model:

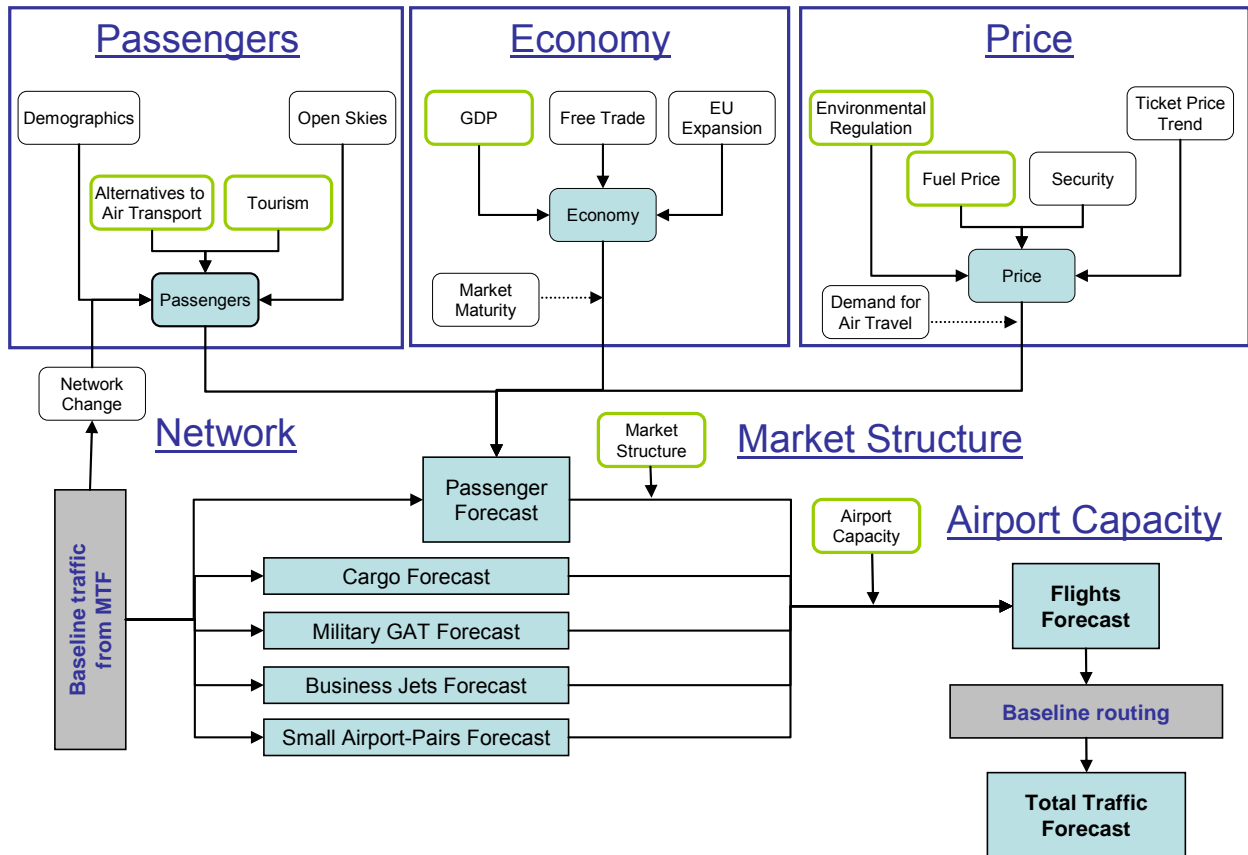
- A group of factors which concern how many **passengers** there are and where they want to fly (excluding price and economic growth). Many of these factors are included in the MTF, but are grouped more closely in the LTF.
- A group of factors which represent the growth of the **economy**, with its knock-on effects to the growth of demand for travel (passenger and cargo). In the MTF, these were all combined in the GDP growth factor.
- A group of factors which describe the **price** of travel. Price is not included explicitly in the MTF because of a lack of data; instead it was included as a low-cost carrier effect, and a higher elasticity in the relationship between GDP growth and demand growth. For the long-term forecast, it is desirable to be able to make explicit the assumptions about the price of travel.
- The **network** model makes adjustment to passenger flows to produce shifts to more hub-and-spoke or more point-to-point traffic.
- The **market structure** describes what flights are provided to meet the forecast demand. In particular it includes assumptions about the size of aircraft that are used.
- The **airport capacity** model restricts growth at constrained airports.

All-cargo, GAT military flights, business jet flights and infrequently-flown airport pairs make up a small but significant part of the total IFR flights. These are modeled explicitly, but with a simplified approach to growth.

The method used for the production of the LTF08 is very similar to the one used for the LTF06. The main changes are: following the change in the MTF method the business jets have been separated from the other passenger traffic and modeled explicitly, the demographics model has been improved to allow for changes in the future age structure of the passengers, new set of flow-specific price elasticity figures is used to model the sensitivity of demand for air travel to changes in fares.

In response to a recommendation of the LTF Workshop, there is more focus on the various effects of the environmental constraints in the current forecast than there was in the previous versions. To picture this, factors in which the environmental effects are considered are all framed in green in Figure 24. In some cases, this may be rather straightforward (such as the participation of the aviation industry in the CO2 emissions trading scheme in the 'Environmental Regulation' factor), in others the link is more subtle (e.g. the shift to larger aircraft in the 'Market Structure').

**Figure 24. Overview of the long-term forecast model structure (environment-related factors shown in green).**



The LTF has a strict relationship with the Medium-Term Forecast (MTF) – each LTF scenario starts with the final year of one of the scenarios from the MTF. This relationship is described in Figure 25, but it means in particular that for this document, only events which happen after 2014 are of interest, because everything up to and including 2014 is covered by the MTF<sup>13</sup>.

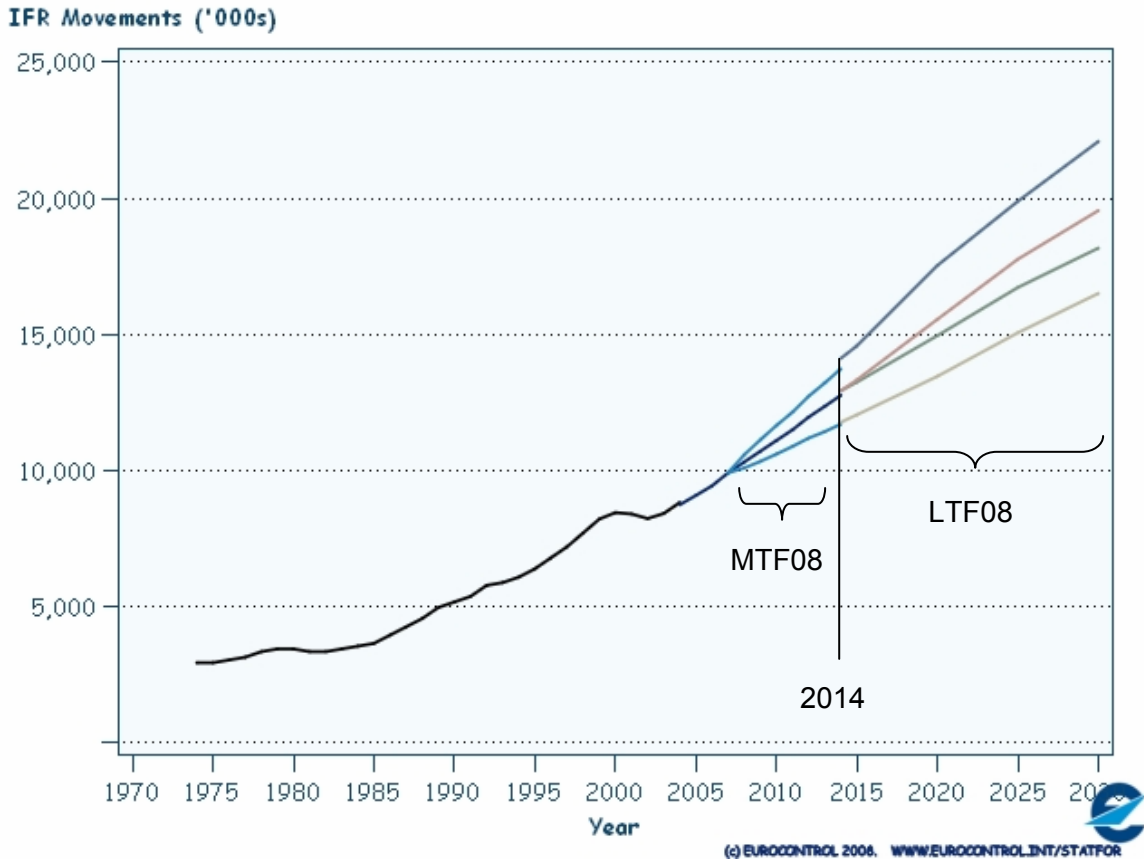
Both MTF and LTF have “scenarios”, but they are used differently in the two forecasts:

- In the MTF, the scenarios typically are used to provide a range of likely values. Any point between the scenarios represents a possible out-turn having more, or less, growth.
- In the LTF, the scenarios represent different possible futures, with qualitative differences: for example, one representing a strongly globalised economy, another a fragmented world. Other futures near each scenario are quite possible, but it might not make sense to talk about a value half way, say, between two scenarios.

The LTF is influenced by the short-term forecast (STF) only very indirectly, as a result of the STF’s influence on the MTF.

<sup>13</sup> The slight change in 2014 is because the LTF08 used updated airport capacity data.

Figure 25: The LTF08 starts where the MTF08 ends.

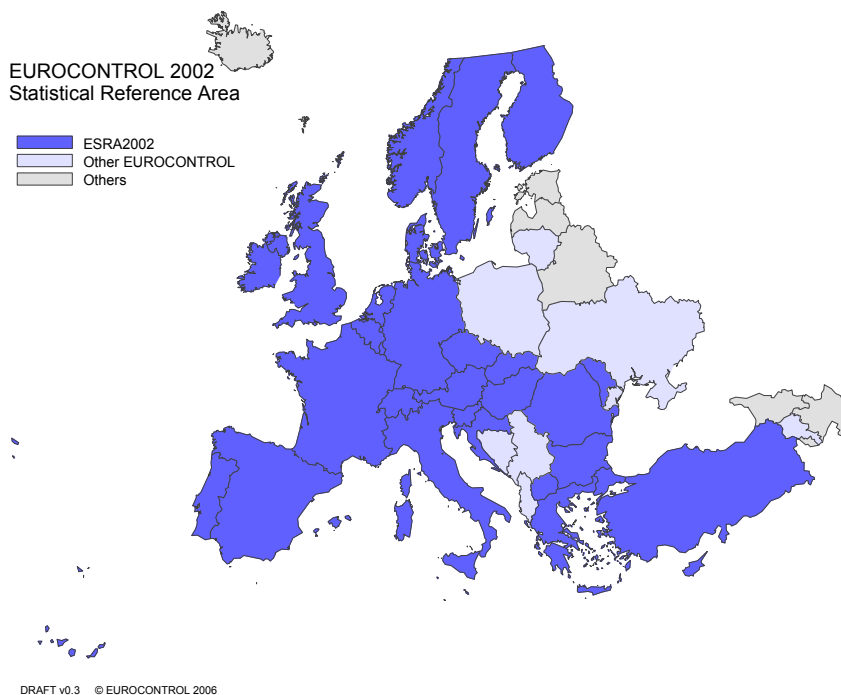


## ANNEX C. EUROCONTROL STATISTICAL REFERENCE AREA (ESRA)

The EUROCONTROL Statistical Reference Area (ESRA), is designed to include as much as possible of the ECAC area for which data are available from a range of sources within the Agency (CRCO, CFMU and STATFOR) sources. It is used for high-level reports from the Agency, when referring to 'total Europe'. The ESRA changes only rarely; a region will not be added to the ESRA until there is at least a full year's data from all sources, so that growth calculations are possible. For this LTF, the ESRA is really 'ESRA2002', meaning that data are available for the total region from the beginning of 2002. Data for the ESRA from earlier years are estimates.

The regions of ESRA are illustrated in this map. The ESRA itself is the dark region. For information, in lighter blue are the regions that might be added to the ESRA in the next few years. The other two shadings indicate regions falling outside the ESRA: either they are within ECAC, but data are not available from all sources; or they are outside ECAC, even if data might be available. Note that the EUROCONTROL forecast includes regions outside of the ESRA (eg Ukraine and Georgia).

**Figure 26. The EUROCONTROL Statistical Reference Area.**



The regions may be taken as referring to FIRs and UIRs or the airspace volumes of ACCs and other control centres. In the medium-term forecast, traffic zones are represented by an aggregate of FIRs & UIR of States. These do not take delegation of airspace into account. The differences between charging areas and ACCs can have a big impact on overflight counts (and thus on total counts where the total is dominated by overflights). For the ESRA as a whole, there is only a small proportion of overflights, so that the difference between a FIR and an ACC definition is small.

## ANNEX D. TRAFFIC REGION DEFINITIONS

For this forecast, traffic flows are described as being to or from one of a number of traffic regions listed in Figure 27 (for example in Figure 29). Each region is made up of a number of traffic zones. Traffic zones are indicated in the table for brevity by the first letters of the ICAO location codes.

The traffic regions are defined for statistical convenience and do not reflect an official position of the EUROCONTROL Agency.

The ESRA was defined in the previous section. For flow purposes, this is split into a “North-West” region mostly of mature air traffic markets, a “Mediterranean” region stretching from the Canaries to Turkey and with a significant tourist element, and an Eastern region.

There are a number of States, including recent EU Members which are not yet in the ESRA and therefore are in the ‘Other region’. These include Poland and the Baltic States, Serbia & Montenegro, Albania and Bosnia.

The Former CIS Region includes the Ukraine (a member of EUROCONTROL) and Armenia and Azerbaijan (members of ECAC). In time these will join the ESRA.

A more complete description of the geographical regions is in the STATFOR geographical hierarchy document (Ref. 12).

**Figure 27. Regions used in flow statistics**

		ICAO region/country
ESRA		
Eur1	ESRA North-West	LO EB EL EK EF LF ED ET EI EH EN ES LS EG LN
Eur2	ESRA Mediterranean	LP LE LI LG LT GC LM LC
Eur3	ESRA East	LK LZ LJ LH LR LB LU LD LW
World 1	North Atlantic	K, C, B + PA, PO, PF, PP
World 2	Middle-East	O+LL+LV
World 3	North-Africa	DA, HE, HL, GM, HS, DT
World 4	Southern Africa	G; D; H; F (except DA, HE, HL, GM, GE, HS, DT and ESRA (GC))
World 5	Far-East	V, Z, R, W (except ZZZZ)
World 6	Oceania	A, P, Y, N (except AFIL, PA, PO, PF, PP)
World 7	Mid-Atlantic	M; T
World 8	South-Atlantic	S
World 9	Former CIS Region	U (except areas in ESRA)
Other	Other	The rest (includes States not yet in ESRA, eg EP; ZZZZ, AFIL, 0... (ie zero); EKVG; GE.., LX.. etc )

**ANNEX E. SUMMARY OF THE FORECAST FOR THE ESRA**

**Figure 28. Growth in the ESRA.**

		IFR Movements(000s)										Annual Growth										AAGR 2030/ 2007	Traffic Multiple 2030/ 2007
		2003	2004	2005	2006	2007	2014	2015	2020	2025	2030	2003	2004	2005	2006	2007	2014	2015	2020	2025	2030		
Total: Internal	ScA	.	.	.	.	.	10,655	10,927	12,570	13,672	14,398	.	.	.	.	.	4.5%	2.6%	2.8%	1.7%	1.0%	<b>2.7%</b>	<b>1.8</b>
	ScB	.	.	.	.	.	9,811	10,067	11,333	12,574	13,380	.	.	.	.	.	3.3%	2.6%	2.4%	2.1%	1.2%	<b>2.3%</b>	<b>1.7</b>
	ScC	6,888	7,116	7,320	7,540	7,843	9,811	9,996	10,832	11,681	12,184	.	3.3%	2.9%	3.0%	4.0%	3.3%	1.9%	1.6%	1.5%	0.8%	<b>1.9%</b>	<b>1.6</b>
	ScD	.	.	.	.	.	8,960	9,132	9,929	10,852	11,567	.	.	.	.	.	1.9%	1.9%	1.7%	1.8%	1.3%	<b>1.7%</b>	<b>1.5</b>
Total: Arr/Dep	ScA	.	.	.	.	.	3,279	3,455	4,686	5,836	7,160	.	.	.	.	.	7.6%	5.4%	6.3%	4.5%	4.2%	<b>5.8%</b>	<b>3.6</b>
	ScB	.	.	.	.	.	2,951	3,085	3,981	4,875	5,759	.	.	.	.	.	6.0%	4.5%	5.2%	4.1%	3.4%	<b>4.8%</b>	<b>2.9</b>
	ScC	1,397	1,559	1,690	1,810	1,964	2,951	3,073	3,891	4,740	5,597	.	12%	8.4%	7.1%	8.5%	6.0%	4.1%	4.8%	4.0%	3.4%	<b>4.7%</b>	<b>2.8</b>
	ScD	.	.	.	.	.	2,657	2,752	3,321	3,943	4,604	.	.	.	.	.	4.4%	3.5%	3.8%	3.5%	3.1%	<b>3.8%</b>	<b>2.3</b>
Total: Overflight	ScA	.	.	.	.	.	185	198	275	382	528	.	.	.	.	.	7.9%	7.2%	6.8%	6.8%	6.7%	<b>7.1%</b>	<b>4.9</b>
	ScB	.	.	.	.	.	168	178	239	314	410	.	.	.	.	.	6.4%	6.0%	6.1%	5.6%	5.5%	<b>5.9%</b>	<b>3.8</b>
	ScC	59	71	78	89	109	168	177	232	303	389	.	21%	9.3%	15%	22%	6.4%	5.5%	5.6%	5.5%	5.1%	<b>5.7%</b>	<b>3.6</b>
	ScD	.	.	.	.	.	156	164	209	266	336	.	.	.	.	.	5.2%	5.2%	5.0%	4.9%	4.8%	<b>5.0%</b>	<b>3.1</b>
Grand Total	ScA	.	.	.	.	.	14,119	14,580	17,532	19,890	22,086	.	.	.	.	.	5.2%	3.3%	3.8%	2.6%	2.1%	<b>3.5%</b>	<b>2.2</b>
	ScB	.	.	.	.	.	12,930	13,330	15,553	17,763	19,549	.	.	.	.	.	3.9%	3.1%	3.1%	2.7%	1.9%	<b>3.0%</b>	<b>2.0</b>
	ScC	8,344	8,746	9,088	9,439	9,916	12,930	13,246	14,955	16,724	18,170	.	4.8%	3.9%	3.9%	5.1%	3.9%	2.4%	2.5%	2.3%	1.7%	<b>2.7%</b>	<b>1.8</b>
	ScD	.	.	.	.	.	11,773	12,048	13,460	15,062	16,507	.	.	.	.	.	2.5%	2.3%	2.2%	2.3%	1.8%	<b>2.2%</b>	<b>1.7</b>

**Figure 29. Traffic and growth on the biggest region-to-region flows through the ESRA.**

				IFR Movements(000s)								Annual Growth										AAGR 2030/ 2007	Traffic Multiple 2030/ 2007		
				2003	2004	2005	2006	2007	2014	2015	2020	2025	2030	2003	2004	2005	2006	2007	2014	2015	2020			2025	2030
1	ESRA North-W	ESRA North-W	ScA	.	.	.	.	.	4904.0	4977.5	5462.4	5761.6	5912.3	.	.	.	.	.	3.0%	1.5%	1.9%	1.1%	0.5%	1.7%	1.5
			ScB	.	.	.	.	.	4625.5	4693.0	5067.4	5377.8	5570.1	.	.	.	.	.	2.1%	1.5%	1.5%	1.2%	0.7%	1.5%	1.4
			ScC	3822.5	3868.4	3877.9	3934.1	3995.5	4625.5	4668.6	4904.5	5075.3	5144.3	.	1.2%	0.2%	1.4%	1.6%	2.1%	0.9%	1.0%	0.7%	0.3%	1.1%	1.3
			ScD	.	.	.	.	.	4301.8	4342.7	4551.1	4782.9	4921.3	.	.	.	.	.	1.1%	1.0%	0.9%	1.0%	0.6%	0.9%	1.2
2	ESRA Mediter	ESRA North-W	ScA	.	.	.	.	.	2355.9	2419.1	2874.1	3116.5	3293.2	.	.	.	.	.	4.7%	2.7%	3.5%	1.6%	1.1%	2.9%	1.9
			ScB	.	.	.	.	.	2161.6	2224.2	2594.3	2894.7	3102.6	.	.	.	.	.	3.4%	2.9%	3.1%	2.2%	1.4%	2.6%	1.8
			ScC	1456.4	1508.8	1568.6	1606.0	1709.5	2161.6	2207.6	2464.4	2673.4	2805.7	.	3.6%	4.0%	2.4%	6.4%	3.4%	2.1%	2.2%	1.6%	1.0%	2.2%	1.6
			ScD	.	.	.	.	.	1969.7	2013.1	2264.6	2491.6	2672.8	.	.	.	.	.	2.0%	2.2%	2.4%	1.9%	1.4%	2.0%	1.6
3	ESRA Mediter	ESRA Mediter	ScA	.	.	.	.	.	2374.2	2446.7	2785.5	3120.7	3367.3	.	.	.	.	.	6.1%	3.1%	2.6%	2.3%	1.5%	3.4%	2.1
			ScB	.	.	.	.	.	2129.1	2206.0	2458.3	2812.4	3045.0	.	.	.	.	.	4.4%	3.6%	2.2%	2.7%	1.6%	2.9%	1.9
			ScC	1247.3	1310.4	1374.9	1471.4	1573.3	2129.1	2182.6	2302.4	2536.3	2714.4	.	5.1%	4.9%	7.0%	6.9%	4.4%	2.5%	1.1%	2.0%	1.4%	2.4%	1.7
			ScD	.	.	.	.	.	1912.0	1963.4	2109.0	2361.0	2547.8	.	.	.	.	.	2.8%	2.7%	1.4%	2.3%	1.5%	2.1%	1.6
4	ESRA East	ESRA North-W	ScA	.	.	.	.	.	860.8	907.7	1180.6	1365.0	1521.7	.	.	.	.	.	8.0%	5.4%	5.4%	2.9%	2.2%	4.9%	3.0
			ScB	.	.	.	.	.	762.0	799.5	1022.1	1247.3	1428.4	.	.	.	.	.	6.1%	4.9%	5.0%	4.1%	2.7%	4.6%	2.8
			ScC	304.0	371.9	435.7	471.6	502.6	762.0	794.7	980.1	1175.3	1315.0	.	22%	17%	8.3%	6.6%	6.1%	4.3%	4.3%	3.7%	2.3%	4.3%	2.6
			ScD	.	.	.	.	.	665.0	693.4	843.7	1013.6	1188.1	.	.	.	.	.	4.1%	4.3%	4.0%	3.7%	3.2%	3.8%	2.4
5	ESRA North-W	North Atlant	ScA	.	.	.	.	.	476.5	497.8	643.3	743.0	867.0	.	.	.	.	.	5.0%	4.5%	5.3%	2.9%	3.1%	4.2%	2.6
			ScB	.	.	.	.	.	434.2	443.6	541.0	602.1	659.6	.	.	.	.	.	3.6%	2.2%	4.1%	2.2%	1.8%	2.9%	1.9
			ScC	284.7	298.6	312.3	321.2	339.6	434.2	439.6	498.0	520.7	540.6	.	4.9%	4.6%	2.8%	5.7%	3.6%	1.3%	2.5%	0.9%	0.8%	2.0%	1.6
			ScD	.	.	.	.	.	395.4	398.7	434.2	459.0	477.5	.	.	.	.	.	2.2%	0.8%	1.7%	1.1%	0.8%	1.5%	1.4
6	ESRA North-W	North-Africa	ScA	.	.	.	.	.	313.5	326.0	407.7	527.0	675.4	.	.	.	.	.	6.4%	4.0%	4.6%	5.3%	5.1%	5.4%	3.3
			ScB	.	.	.	.	.	291.9	302.2	362.8	422.2	483.7	.	.	.	.	.	5.4%	3.5%	3.7%	3.1%	2.8%	3.9%	2.4
			ScC	142.9	161.5	176.7	185.6	202.5	291.9	301.9	371.4	443.7	525.4	.	13%	9.4%	5.1%	9.1%	5.4%	3.4%	4.2%	3.6%	3.4%	4.2%	2.6
			ScD	.	.	.	.	.	273.2	280.7	323.9	370.3	418.2	.	.	.	.	.	4.4%	2.7%	2.9%	2.7%	2.5%	3.2%	2.1

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				IFR Movements(000s)									Annual Growth										AAGR 2030/ 2007	Traffic Multiple 2030/ 2007	
				2003	2004	2005	2006	2007	2014	2015	2020	2025	2030	2003	2004	2005	2006	2007	2014	2015	2020	2025	2030		
7	ESRA East	ESRA Mediter	ScA	.	.	.	.	.	340.0	363.4	503.1	600.6	681.5	.	.	.	.	.	10%	6.9%	6.7%	3.6%	2.6%	<b>6.1%</b>	<b>3.9</b>
			ScB	.	.	.	.	.	292.2	311.5	430.4	546.9	629.1	.	.	.	.	.	7.7%	6.6%	6.7%	4.9%	2.8%	<b>5.8%</b>	<b>3.6</b>
			ScC	89.3	107.5	131.9	151.3	173.8	292.2	308.7	400.8	502.5	563.6	.	20%	23%	15%	15%	7.7%	5.6%	5.4%	4.6%	2.3%	<b>5.2%</b>	<b>3.2</b>
			ScD	.	.	.	.	.	251.6	265.8	347.2	438.4	533.3	.	.	.	.	.	5.4%	5.7%	5.5%	4.8%	4.0%	<b>5.0%</b>	<b>3.1</b>
8	ESRA North-W	Former CIS R	ScA	.	.	.	.	.	258.2	273.9	374.5	467.1	580.0	.	.	.	.	.	7.5%	6.1%	6.5%	4.5%	4.4%	<b>5.9%</b>	<b>3.7</b>
			ScB	.	.	.	.	.	234.5	246.8	320.4	399.7	482.6	.	.	.	.	.	6.0%	5.3%	5.4%	4.5%	3.8%	<b>5.0%</b>	<b>3.1</b>
			ScC	98.9	113.4	122.3	135.7	155.6	234.5	246.4	331.0	426.4	538.0	.	15%	7.9%	11%	15%	6.0%	5.1%	6.1%	5.2%	4.8%	<b>5.5%</b>	<b>3.5</b>
			ScD	.	.	.	.	.	209.7	218.6	269.4	325.0	386.4	.	.	.	.	.	4.4%	4.2%	4.3%	3.8%	3.5%	<b>4.0%</b>	<b>2.5</b>
9	ESRA North-W	Far-East	ScA	.	.	.	.	.	297.3	319.7	504.0	630.9	796.4	.	.	.	.	.	10%	7.5%	9.5%	4.6%	4.8%	<b>7.5%</b>	<b>5.3</b>
			ScB	.	.	.	.	.	270.6	285.3	402.3	516.9	639.7	.	.	.	.	.	8.8%	5.5%	7.1%	5.1%	4.4%	<b>6.5%</b>	<b>4.3</b>
			ScC	97.0	115.2	126.6	141.2	150.0	270.6	285.1	399.8	498.0	609.1	.	19%	9.9%	12%	6.2%	8.8%	5.4%	7.0%	4.5%	4.1%	<b>6.3%</b>	<b>4.1</b>
			ScD	.	.	.	.	.	245.6	256.8	337.7	424.0	517.6	.	.	.	.	.	7.3%	4.5%	5.6%	4.7%	4.1%	<b>5.5%</b>	<b>3.5</b>
10	ESRA North-W	Middle-East	ScA	.	.	.	.	.	210.7	217.5	284.0	355.0	420.3	.	.	.	.	.	5.1%	3.2%	5.5%	4.6%	3.4%	<b>4.6%</b>	<b>2.8</b>
			ScB	.	.	.	.	.	196.4	201.9	248.7	289.2	330.5	.	.	.	.	.	4.1%	2.8%	4.2%	3.1%	2.7%	<b>3.5%</b>	<b>2.2</b>
			ScC	110.4	125.6	135.2	142.6	148.3	196.4	201.8	247.3	278.9	311.4	.	14%	7.6%	5.5%	4.0%	4.1%	2.8%	4.1%	2.4%	2.2%	<b>3.3%</b>	<b>2.1</b>
			ScD	.	.	.	.	.	182.4	185.6	213.3	237.7	259.6	.	.	.	.	.	3.0%	1.8%	2.8%	2.2%	1.8%	<b>2.5%</b>	<b>1.8</b>
11	ESRA East	ESRA East	ScA	.	.	.	.	.	297.0	319.3	438.8	534.0	610.6	.	.	.	.	.	12%	7.5%	6.6%	4.0%	2.7%	<b>6.9%</b>	<b>4.6</b>
			ScB	.	.	.	.	.	248.3	264.1	355.7	452.0	523.8	.	.	.	.	.	9.4%	6.3%	6.1%	4.9%	3.0%	<b>6.2%</b>	<b>4.0</b>
			ScC	97.1	107.3	117.9	124.2	132.6	248.3	261.7	333.1	418.0	465.4	.	10%	9.9%	5.4%	6.7%	9.4%	5.4%	4.9%	4.6%	2.2%	<b>5.6%</b>	<b>3.5</b>
			ScD	.	.	.	.	.	208.6	220.7	283.4	359.5	441.9	.	.	.	.	.	6.7%	5.8%	5.1%	4.9%	4.2%	<b>5.4%</b>	<b>3.3</b>
12	ESRA Mediter	Former CIS R	ScA	.	.	.	.	.	207.1	223.7	330.3	417.0	513.9	.	.	.	.	.	11%	8.0%	8.1%	4.8%	4.3%	<b>7.4%</b>	<b>5.2</b>
			ScB	.	.	.	.	.	183.2	198.3	282.3	367.3	439.7	.	.	.	.	.	9.2%	8.3%	7.3%	5.4%	3.7%	<b>6.7%</b>	<b>4.4</b>
			ScC	56.1	66.1	72.3	82.0	99.2	183.2	197.9	283.9	397.7	498.6	.	18%	9.3%	14%	21%	9.2%	8.0%	7.5%	7.0%	4.6%	<b>7.3%</b>	<b>5.0</b>
			ScD	.	.	.	.	.	163.5	175.2	238.0	310.7	384.0	.	.	.	.	.	7.4%	7.2%	6.3%	5.5%	4.3%	<b>6.1%</b>	<b>3.9</b>

## ANNEX F. FUTURE TRAFFIC AND GROWTH

### F.1 Summary of the Forecast. Annual IFR Movements 2003-2030.

**Figure 30. Annual traffic per traffic zone, 2007-2030 average annual growth and 2030/2007 traffic multiple.**

		2003	2004	2005	2006	2007	2014	2015	2020	2025	2030	AAGR 2030/ 2007	Traffic Multiple 2030/ 2007
Albania	ScA	.	.	.	.	.	209	217	271	324	389	4.5%	2.7
	ScB	.	.	.	.	.	191	199	251	296	338	3.8%	2.4
	ScC	93	105	116	119	142	191	198	237	281	317	3.6%	2.2
	ScD	.	.	.	.	.	175	181	212	248	287	3.1%	2.0
Armenia	ScA	.	.	.	.	.	105	114	172	243	342	8.7%	6.8
	ScB	.	.	.	.	.	95	103	147	200	269	7.6%	5.4
	ScC	.	39	42	43	50	95	102	145	196	260	7.4%	5.2
	ScD	.	.	.	.	.	88	94	129	170	221	6.7%	4.4
Austria	ScA	.	.	.	.	.	1,763	1,839	2,340	2,626	2,874	3.9%	2.4
	ScB	.	.	.	.	.	1,623	1,684	2,044	2,393	2,634	3.6%	2.2
	ScC	870	954	1,049	1,092	1,180	1,623	1,675	1,981	2,285	2,508	3.3%	2.1
	ScD	.	.	.	.	.	1,462	1,505	1,741	1,980	2,201	2.7%	1.9
Azerbaijan	ScA	.	.	.	.	.	219	238	369	523	745	9.3%	7.8
	ScB	.	.	.	.	.	197	212	308	428	584	8.2%	6.1
	ScC	.	.	.	92	96	197	212	305	417	564	8.0%	5.9
	ScD	.	.	.	.	.	180	192	267	359	474	7.2%	4.9
Belarus	ScA	.	.	.	.	.	330	354	506	666	868	7.3%	5.0
	ScB	.	.	.	.	.	294	311	421	554	697	6.2%	4.0
	ScC	.	119	130	146	173	294	311	423	567	726	6.4%	4.2
	ScD	.	.	.	.	.	262	276	353	449	560	5.2%	3.2
Belgium/Luxembourg	ScA	.	.	.	.	.	1,477	1,515	1,838	2,072	2,269	3.2%	2.1
	ScB	.	.	.	.	.	1,369	1,406	1,664	1,876	2,049	2.7%	1.9
	ScC	964	982	1,007	1,056	1,100	1,369	1,400	1,625	1,794	1,939	2.5%	1.8
	ScD	.	.	.	.	.	1,259	1,284	1,450	1,614	1,759	2.1%	1.6
Bosnia-Herzegovina	ScA	.	.	.	.	.	321	338	445	532	620	5.0%	3.1
	ScB	.	.	.	.	.	288	302	390	471	537	4.4%	2.7
	ScC	82	126	159	168	201	288	300	368	439	494	4.0%	2.5
	ScD	.	.	.	.	.	257	268	328	391	451	3.6%	2.2

		2003	2004	2005	2006	2007	2014	2015	2020	2025	2030	AAGR 2030/ 2007	Traffic Multiple 2030/ 2007
Bulgaria	ScA	.	.	.	.	.	757	798	1,054	1,250	1,442	5.3%	3.2
	ScB	.	.	.	.	.	683	721	933	1,125	1,278	4.7%	2.9
	ScC	312	358	395	402	444	683	718	897	1,084	1,223	4.5%	2.8
	ScD	.	.	.	.	.	612	641	795	959	1,105	4.0%	2.5
Canary Islands	ScA	.	.	.	.	.	450	465	591	720	853	4.5%	2.8
	ScB	.	.	.	.	.	406	421	505	597	687	3.5%	2.2
	ScC	266	278	291	303	308	406	416	476	538	596	2.9%	1.9
	ScD	.	.	.	.	.	364	374	429	487	543	2.5%	1.8
Croatia	ScA	.	.	.	.	.	625	660	865	1,032	1,210	5.0%	3.0
	ScB	.	.	.	.	.	563	590	748	893	1,021	4.2%	2.6
	ScC	231	282	331	339	398	563	586	714	841	949	3.9%	2.4
	ScD	.	.	.	.	.	506	528	642	755	865	3.4%	2.2
Cyprus	ScA	.	.	.	.	.	390	410	552	724	879	5.8%	3.6
	ScB	.	.	.	.	.	354	371	472	585	709	4.8%	2.9
	ScC	198	206	208	217	242	354	370	462	560	666	4.5%	2.8
	ScD	.	.	.	.	.	323	336	406	481	563	3.7%	2.3
Czech Republic	ScA	.	.	.	.	.	1,072	1,128	1,508	1,716	1,895	4.8%	2.9
	ScB	.	.	.	.	.	955	998	1,273	1,564	1,726	4.4%	2.7
	ScC	454	552	597	612	646	955	993	1,239	1,506	1,655	4.2%	2.6
	ScD	.	.	.	.	.	849	878	1,063	1,268	1,479	3.7%	2.3
Denmark	ScA	.	.	.	.	.	868	898	1,102	1,273	1,403	3.5%	2.2
	ScB	.	.	.	.	.	806	830	976	1,127	1,259	3.0%	2.0
	ScC	541	586	585	602	631	806	826	949	1,070	1,179	2.8%	1.9
	ScD	.	.	.	.	.	737	753	839	944	1,039	2.2%	1.6
Estonia	ScA	.	.	.	.	.	292	311	442	570	721	7.0%	4.7
	ScB	.	.	.	.	.	257	271	361	468	582	6.0%	3.8
	ScC	.	.	145	137	154	257	269	354	451	557	5.8%	3.6
	ScD	.	.	.	.	.	227	237	300	377	464	4.9%	3.0
FYROM	ScA	.	.	.	.	.	190	200	259	311	357	4.7%	2.9
	ScB	.	.	.	.	.	172	180	235	288	330	4.4%	2.7
	ScC	97	105	111	118	123	172	179	218	266	301	4.0%	2.4
	ScD	.	.	.	.	.	156	162	195	234	278	3.6%	2.3
Finland	ScA	.	.	.	.	.	331	344	425	506	591	3.9%	2.4
	ScB	.	.	.	.	.	302	311	367	427	489	3.0%	2.0
	ScC	228	243	242	246	245	302	309	350	393	437	2.5%	1.8
	ScD	.	.	.	.	.	272	278	315	357	399	2.1%	1.6

		2003	2004	2005	2006	2007	2014	2015	2020	2025	2030	AAGR 2030/ 2007	Traffic Multiple 2030/ 2007
France	ScA	.	.	.	.	.	4,136	4,231	4,866	5,387	5,888	2.9%	1.9
	ScB	.	.	.	.	.	3,808	3,904	4,473	4,935	5,307	2.5%	1.8
	ScC	2,584	2,665	2,747	2,854	3,025	3,808	3,882	4,332	4,678	4,958	2.2%	1.6
	ScD	.	.	.	.	.	3,506	3,571	3,948	4,331	4,669	1.9%	1.5
Georgia	ScA	.	.	.	.	.	168	181	270	365	494	7.9%	5.8
	ScB	.	.	.	.	.	153	163	227	301	392	6.8%	4.6
	ScC	.	65	74	73	86	153	163	226	295	382	6.7%	4.5
	ScD	.	.	.	.	.	140	148	197	253	321	5.9%	3.7
Germany	ScA	.	.	.	.	.	4,381	4,518	5,465	6,028	6,531	3.3%	2.1
	ScB	.	.	.	.	.	4,013	4,124	4,833	5,494	5,969	2.9%	1.9
	ScC	2,553	2,712	2,852	2,971	3,108	4,013	4,104	4,687	5,221	5,627	2.6%	1.8
	ScD	.	.	.	.	.	3,647	3,723	4,183	4,656	5,075	2.2%	1.6
Greece	ScA	.	.	.	.	.	958	1,003	1,279	1,505	1,674	4.4%	2.7
	ScB	.	.	.	.	.	865	901	1,112	1,329	1,495	3.9%	2.4
	ScC	477	534	548	566	621	865	895	1,069	1,250	1,415	3.6%	2.3
	ScD	.	.	.	.	.	783	808	948	1,096	1,235	3.0%	2.0
Hungary	ScA	.	.	.	.	.	1,013	1,069	1,441	1,749	2,002	5.3%	3.3
	ScB	.	.	.	.	.	913	960	1,246	1,532	1,782	4.7%	2.9
	ScC	454	524	579	605	615	913	955	1,198	1,453	1,669	4.4%	2.7
	ScD	.	.	.	.	.	816	851	1,045	1,259	1,472	3.9%	2.4
Ireland	ScA	.	.	.	.	.	952	991	1,227	1,427	1,649	4.5%	2.8
	ScB	.	.	.	.	.	845	871	1,059	1,223	1,385	3.7%	2.3
	ScC	489	503	536	565	598	845	863	992	1,088	1,178	3.0%	2.0
	ScD	.	.	.	.	.	750	766	870	972	1,070	2.6%	1.8
Italy	ScA	.	.	.	.	.	2,513	2,590	3,080	3,450	3,835	3.4%	2.2
	ScB	.	.	.	.	.	2,282	2,343	2,726	3,076	3,322	2.8%	1.9
	ScC	1,492	1,520	1,577	1,641	1,779	2,282	2,327	2,624	2,895	3,110	2.5%	1.7
	ScD	.	.	.	.	.	2,070	2,109	2,353	2,582	2,782	2.0%	1.6
Latvia	ScA	.	.	.	.	.	383	406	576	742	932	6.8%	4.6
	ScB	.	.	.	.	.	340	358	478	618	766	5.9%	3.8
	ScC	.	142	155	176	203	340	356	470	601	741	5.8%	3.6
	ScD	.	.	.	.	.	301	316	401	505	619	5.0%	3.0
Lisbon FIR	ScA	.	.	.	.	.	646	665	797	954	1,117	4.3%	2.6
	ScB	.	.	.	.	.	580	601	687	803	914	3.4%	2.1
	ScC	344	363	380	401	427	580	596	658	743	822	2.9%	1.9
	ScD	.	.	.	.	.	520	534	580	653	720	2.3%	1.7

		2003	2004	2005	2006	2007	2014	2015	2020	2025	2030	AAGR 2030/ 2007	Traffic Multiple 2030/ 2007
Lithuania	ScA	.	.	.	.	.	345	364	501	655	827	6.4%	4.2
	ScB	.	.	.	.	.	313	327	431	573	715	5.7%	3.6
	ScC	.	148	163	173	199	313	326	427	565	709	5.7%	3.6
	ScD	.	.	.	.	.	281	295	374	482	597	4.9%	3.0
Malta	ScA	.	.	.	.	.	127	132	170	207	251	5.0%	3.1
	ScB	.	.	.	.	.	115	120	149	177	205	4.1%	2.5
	ScC	70	73	75	76	82	115	119	146	172	200	4.0%	2.4
	ScD	.	.	.	.	.	105	109	129	150	172	3.3%	2.1
Moldova	ScA	.	.	.	.	.	68	73	105	137	174	7.3%	5.0
	ScB	.	.	.	.	.	61	64	88	114	142	6.3%	4.1
	ScC	21	24	26	28	35	61	64	87	114	143	6.3%	4.1
	ScD	.	.	.	.	.	54	57	74	95	118	5.5%	3.4
Netherlands	ScA	.	.	.	.	.	1,526	1,566	2,008	2,207	2,387	3.4%	2.2
	ScB	.	.	.	.	.	1,426	1,466	1,772	2,035	2,197	3.0%	2.0
	ScC	923	968	996	1,056	1,108	1,426	1,460	1,718	1,923	2,076	2.8%	1.9
	ScD	.	.	.	.	.	1,300	1,327	1,510	1,688	1,844	2.2%	1.7
Norway	ScA	.	.	.	.	.	702	724	852	970	1,034	2.9%	1.9
	ScB	.	.	.	.	.	648	663	750	838	915	2.3%	1.7
	ScC	442	467	484	513	536	648	658	715	768	811	1.8%	1.5
	ScD	.	.	.	.	.	596	606	659	713	758	1.5%	1.4
Poland	ScA	.	.	.	.	.	1,040	1,108	1,516	1,877	2,278	6.3%	4.1
	ScB	.	.	.	.	.	899	948	1,261	1,627	1,997	5.7%	3.6
	ScC	301	364	423	491	556	899	943	1,229	1,560	1,902	5.5%	3.4
	ScD	.	.	.	.	.	780	817	1,034	1,291	1,577	4.6%	2.8
Romania	ScA	.	.	.	.	.	789	836	1,151	1,440	1,726	6.2%	4.0
	ScB	.	.	.	.	.	704	743	976	1,222	1,458	5.4%	3.4
	ScC	326	372	411	416	432	704	738	942	1,159	1,364	5.1%	3.2
	ScD	.	.	.	.	.	620	648	812	994	1,177	4.5%	2.7
Santa Maria FIR	ScA	.	.	.	.	.	161	166	219	271	335	5.0%	3.1
	ScB	.	.	.	.	.	147	152	184	217	251	3.7%	2.3
	ScC	98	102	106	107	109	147	151	175	198	222	3.2%	2.0
	ScD	.	.	.	.	.	135	137	153	168	183	2.3%	1.7
Serbia&Montenegro	ScA	.	.	.	.	.	727	762	978	1,134	1,280	4.6%	2.8
	ScB	.	.	.	.	.	658	689	890	1,049	1,162	4.1%	2.5
	ScC	265	315	361	393	458	658	685	839	998	1,095	3.9%	2.4
	ScD	.	.	.	.	.	592	615	743	881	1,007	3.5%	2.2

		2003	2004	2005	2006	2007	2014	2015	2020	2025	2030	AAGR 2030/ 2007	Traffic Multiple 2030/ 2007
Slovakia	ScA	.	.	.	.	.	558	590	807	982	1,142	5.6%	3.5
	ScB	.	.	.	.	.	495	520	676	842	984	4.9%	3.0
	ScC	233	284	318	330	324	495	517	653	800	925	4.7%	2.9
	ScD	.	.	.	.	.	438	456	562	680	798	4.0%	2.5
Slovenia	ScA	.	.	.	.	.	471	495	634	739	847	4.5%	2.8
	ScB	.	.	.	.	.	427	446	556	658	742	3.9%	2.4
	ScC	192	222	257	267	306	427	443	532	621	691	3.6%	2.3
	ScD	.	.	.	.	.	384	399	476	555	629	3.2%	2.1
Spain	ScA	.	.	.	.	.	2,661	2,736	3,267	3,746	4,202	3.8%	2.4
	ScB	.	.	.	.	.	2,396	2,479	2,835	3,266	3,613	3.1%	2.0
	ScC	1,385	1,470	1,561	1,641	1,779	2,396	2,457	2,691	3,005	3,281	2.7%	1.8
	ScD	.	.	.	.	.	2,149	2,204	2,411	2,711	2,988	2.3%	1.7
Sweden	ScA	.	.	.	.	.	982	1,019	1,243	1,465	1,666	3.8%	2.4
	ScB	.	.	.	.	.	931	961	1,115	1,312	1,501	3.3%	2.1
	ScC	610	665	664	689	708	931	956	1,082	1,242	1,399	3.0%	2.0
	ScD	.	.	.	.	.	845	866	957	1,093	1,226	2.4%	1.7
Switzerland	ScA	.	.	.	.	.	1,519	1,557	1,751	1,887	2,091	2.9%	1.9
	ScB	.	.	.	.	.	1,398	1,436	1,642	1,789	1,931	2.5%	1.8
	ScC	949	977	1,008	1,032	1,093	1,398	1,428	1,596	1,718	1,820	2.2%	1.7
	ScD	.	.	.	.	.	1,274	1,300	1,440	1,577	1,687	1.9%	1.5
Turkey	ScA	.	.	.	.	.	1,310	1,380	1,802	2,170	2,536	5.4%	3.3
	ScB	.	.	.	.	.	1,200	1,275	1,647	2,007	2,311	5.0%	3.1
	ScC	472	562	642	693	757	1,200	1,268	1,579	1,934	2,228	4.8%	2.9
	ScD	.	.	.	.	.	1,103	1,163	1,455	1,770	2,043	4.4%	2.7
Ukraine	ScA	.	.	.	.	.	693	745	1,097	1,449	1,887	7.3%	5.1
	ScB	.	.	.	.	.	626	666	926	1,213	1,531	6.3%	4.1
	ScC	.	312	341	345	373	626	664	919	1,216	1,540	6.4%	4.1
	ScD	.	.	.	.	.	567	599	790	1,013	1,265	5.5%	3.4
UK	ScA	.	.	.	.	.	3,372	3,464	4,284	4,827	5,318	3.2%	2.1
	ScB	.	.	.	.	.	3,159	3,232	3,884	4,325	4,725	2.7%	1.9
	ScC	2,156	2,266	2,385	2,465	2,550	3,159	3,215	3,727	4,008	4,240	2.2%	1.7
	ScD	.	.	.	.	.	2,934	2,989	3,405	3,768	4,061	2.0%	1.6
ESRA	ScA	.	.	.	.	.	14,119	14,580	17,532	19,890	22,086	3.5%	2.2
	ScB	.	.	.	.	.	12,930	13,330	15,553	17,763	19,549	3.0%	2.0
	ScC	8,344	8,746	9,088	9,439	9,916	12,930	13,246	14,955	16,724	18,170	2.7%	1.8
	ScD	.	.	.	.	.	11,773	12,048	13,460	15,062	16,507	2.2%	1.7

## F.2 Summary of the Forecast. Growth Rates 2004-2030

**Figure 31. Annual growth rates per traffic zone, 2007-2030 average annual growth and 2030/2007 traffic multiple.**

		2004	2005	2006	2007	2014 / 2008	2015	2020 / 2016	2025 / 2021	2030 / 2026	AAGR 2030/ 2007	Traffic Multiple 2030/ 2007
Albania	ScA	.	.	.	.	5.7%	4.1%	4.5%	3.6%	3.7%	4.5%	2.7
	ScB	.	.	.	.	4.4%	4.0%	4.8%	3.3%	2.7%	3.8%	2.4
	ScC	12%	11%	2.7%	19%	4.4%	3.4%	3.7%	3.4%	2.5%	3.6%	2.2
	ScD	.	.	.	.	3.0%	3.3%	3.3%	3.1%	2.9%	3.1%	2.0
Armenia	ScA	.	.	.	.	11%	8.6%	8.5%	7.2%	7.1%	8.7%	6.8
	ScB	.	.	.	.	9.6%	7.7%	7.4%	6.4%	6.1%	7.6%	5.4
	ScC	.	7.7%	2.7%	16%	9.6%	7.3%	7.2%	6.2%	5.8%	7.4%	5.2
	ScD	.	.	.	.	8.3%	6.8%	6.5%	5.8%	5.4%	6.7%	4.4
Austria	ScA	.	.	.	.	5.9%	4.3%	4.9%	2.3%	1.8%	3.9%	2.4
	ScB	.	.	.	.	4.7%	3.7%	4.0%	3.2%	1.9%	3.6%	2.2
	ScC	9.7%	9.9%	4.1%	8.1%	4.7%	3.2%	3.4%	2.9%	1.9%	3.3%	2.1
	ScD	.	.	.	.	3.1%	2.9%	3.0%	2.6%	2.1%	2.7%	1.9
Azerbaijan	ScA	.	.	.	.	12%	8.9%	9.1%	7.2%	7.3%	9.3%	7.8
	ScB	.	.	.	.	11%	7.8%	7.7%	6.8%	6.4%	8.2%	6.1
	ScC	.	.	.	4.9%	11%	7.5%	7.6%	6.5%	6.2%	8.0%	5.9
	ScD	.	.	.	.	9.4%	6.9%	6.8%	6.1%	5.7%	7.2%	4.9
Belarus	ScA	.	.	.	.	9.6%	7.3%	7.4%	5.6%	5.4%	7.3%	5.0
	ScB	.	.	.	.	7.8%	6.1%	6.2%	5.7%	4.7%	6.2%	4.0
	ScC	.	9.3%	13%	19%	7.8%	5.8%	6.4%	6.0%	5.1%	6.4%	4.2
	ScD	.	.	.	.	6.1%	5.3%	5.1%	4.9%	4.5%	5.2%	3.2
Belgium/Luxembourg	ScA	.	.	.	.	4.3%	2.6%	3.9%	2.4%	1.8%	3.2%	2.1
	ScB	.	.	.	.	3.2%	2.7%	3.4%	2.4%	1.8%	2.7%	1.9
	ScC	1.9%	2.5%	4.9%	4.2%	3.2%	2.3%	3.0%	2.0%	1.6%	2.5%	1.8
	ScD	.	.	.	.	1.9%	1.9%	2.5%	2.2%	1.7%	2.1%	1.6
Bosnia-Herzegovina	ScA	.	.	.	.	6.9%	5.5%	5.6%	3.6%	3.1%	5.0%	3.1
	ScB	.	.	.	.	5.3%	4.9%	5.3%	3.8%	2.6%	4.4%	2.7
	ScC	53%	26%	5.5%	19%	5.3%	4.1%	4.2%	3.6%	2.4%	4.0%	2.5
	ScD	.	.	.	.	3.6%	4.2%	4.1%	3.6%	2.9%	3.6%	2.2
Bulgaria	ScA	.	.	.	.	7.9%	5.3%	5.7%	3.5%	2.9%	5.3%	3.2
	ScB	.	.	.	.	6.3%	5.6%	5.3%	3.8%	2.6%	4.7%	2.9
	ScC	15%	10%	1.6%	11%	6.3%	5.1%	4.6%	3.9%	2.4%	4.5%	2.8
	ScD	.	.	.	.	4.7%	4.7%	4.4%	3.8%	2.9%	4.0%	2.5

		2004	2005	2006	2007	2014 / 2008	2015	2020 / 2016	2025 / 2021	2030 / 2026	AAGR 2030/ 2007	Traffic Multiple 2030/ 2007
Canary Islands	ScA	.	.	.	.	5.6%	3.4%	4.9%	4.0%	3.5%	4.5%	2.8
	ScB	.	.	.	.	4.0%	3.8%	3.7%	3.4%	2.9%	3.5%	2.2
	ScC	4.4%	4.9%	4.0%	1.7%	4.0%	2.7%	2.7%	2.5%	2.1%	2.9%	1.9
	ScD	.	.	.	.	2.4%	2.8%	2.7%	2.6%	2.2%	2.5%	1.8
Croatia	ScA	.	.	.	.	6.7%	5.7%	5.6%	3.6%	3.2%	5.0%	3.0
	ScB	.	.	.	.	5.1%	4.8%	4.8%	3.6%	2.7%	4.2%	2.6
	ScC	22%	18%	2.4%	17%	5.1%	4.1%	4.0%	3.3%	2.5%	3.9%	2.4
	ScD	.	.	.	.	3.5%	4.3%	4.0%	3.3%	2.8%	3.4%	2.2
Cyprus	ScA	.	.	.	.	7.0%	5.3%	6.1%	5.6%	4.0%	5.8%	3.6
	ScB	.	.	.	.	5.6%	4.9%	4.9%	4.4%	3.9%	4.8%	2.9
	ScC	3.8%	1.3%	4.1%	12%	5.6%	4.5%	4.5%	3.9%	3.5%	4.5%	2.8
	ScD	.	.	.	.	4.2%	3.9%	3.8%	3.5%	3.2%	3.7%	2.3
Czech Republic	ScA	.	.	.	.	7.5%	5.2%	6.0%	2.6%	2.0%	4.8%	2.9
	ScB	.	.	.	.	5.7%	4.5%	5.0%	4.2%	2.0%	4.4%	2.7
	ScC	22%	8.2%	2.4%	5.6%	5.7%	3.9%	4.5%	4.0%	1.9%	4.2%	2.6
	ScD	.	.	.	.	4.0%	3.5%	3.9%	3.6%	3.1%	3.7%	2.3
Denmark	ScA	.	.	.	.	4.7%	3.4%	4.2%	2.9%	2.0%	3.5%	2.2
	ScB	.	.	.	.	3.6%	3.0%	3.3%	2.9%	2.2%	3.0%	2.0
	ScC	8.4%	-0.2%	2.9%	4.8%	3.6%	2.5%	2.8%	2.4%	2.0%	2.8%	1.9
	ScD	.	.	.	.	2.2%	2.2%	2.2%	2.4%	1.9%	2.2%	1.6
Estonia	ScA	.	.	.	.	9.6%	6.5%	7.3%	5.2%	4.8%	7.0%	4.7
	ScB	.	.	.	.	7.6%	5.3%	5.9%	5.3%	4.5%	6.0%	3.8
	ScC	.	.	-5.7%	12%	7.6%	4.8%	5.6%	5.0%	4.3%	5.8%	3.6
	ScD	.	.	.	.	5.7%	4.7%	4.8%	4.7%	4.2%	4.9%	3.0
FYROM	ScA	.	.	.	.	6.5%	5.1%	5.3%	3.7%	2.8%	4.7%	2.9
	ScB	.	.	.	.	5.0%	4.6%	5.5%	4.2%	2.7%	4.4%	2.7
	ScC	8.7%	5.3%	6.8%	3.9%	5.0%	3.8%	4.1%	4.0%	2.5%	4.0%	2.4
	ScD	.	.	.	.	3.4%	3.8%	3.8%	3.8%	3.5%	3.6%	2.3
Finland	ScA	.	.	.	.	4.4%	3.8%	4.3%	3.6%	3.2%	3.9%	2.4
	ScB	.	.	.	.	3.0%	3.0%	3.3%	3.1%	2.7%	3.0%	2.0
	ScC	6.6%	-0.3%	1.4%	-0.3%	3.0%	2.2%	2.6%	2.3%	2.1%	2.5%	1.8
	ScD	.	.	.	.	1.5%	2.4%	2.6%	2.5%	2.2%	2.1%	1.6
France	ScA	.	.	.	.	4.6%	2.3%	2.8%	2.1%	1.8%	2.9%	1.9
	ScB	.	.	.	.	3.3%	2.5%	2.8%	2.0%	1.5%	2.5%	1.8
	ScC	3.1%	3.1%	3.9%	6.0%	3.3%	1.9%	2.2%	1.6%	1.2%	2.2%	1.6
	ScD	.	.	.	.	2.1%	1.8%	2.0%	1.9%	1.5%	1.9%	1.5

		2004	2005	2006	2007	2014 / 2008	2015	2020 / 2016	2025 / 2021	2030 / 2026	AAGR 2030/ 2007	Traffic Multiple 2030/ 2007
Georgia	ScA	.	.	.	.	10%	7.6%	8.3%	6.2%	6.2%	7.9%	5.8
	ScB	.	.	.	.	8.6%	6.7%	6.8%	5.8%	5.4%	6.8%	4.6
	ScC	.	14%	-1.2%	17%	8.6%	6.5%	6.7%	5.5%	5.3%	6.7%	4.5
	ScD	.	.	.	.	7.2%	5.8%	5.8%	5.1%	4.8%	5.9%	3.7
Germany	ScA	.	.	.	.	5.0%	3.1%	3.9%	2.0%	1.6%	3.3%	2.1
	ScB	.	.	.	.	3.7%	2.8%	3.2%	2.6%	1.7%	2.9%	1.9
	ScC	6.2%	5.2%	4.2%	4.6%	3.7%	2.3%	2.7%	2.2%	1.5%	2.6%	1.8
	ScD	.	.	.	.	2.3%	2.1%	2.4%	2.2%	1.7%	2.2%	1.6
Greece	ScA	.	.	.	.	6.4%	4.7%	5.0%	3.3%	2.2%	4.4%	2.7
	ScB	.	.	.	.	4.8%	4.1%	4.3%	3.6%	2.4%	3.9%	2.4
	ScC	12%	2.5%	3.2%	9.9%	4.8%	3.5%	3.6%	3.2%	2.5%	3.6%	2.3
	ScD	.	.	.	.	3.4%	3.2%	3.2%	2.9%	2.4%	3.0%	2.0
Hungary	ScA	.	.	.	.	7.4%	5.5%	6.1%	4.0%	2.7%	5.3%	3.3
	ScB	.	.	.	.	5.8%	5.1%	5.3%	4.2%	3.1%	4.7%	2.9
	ScC	15%	11%	4.4%	1.8%	5.8%	4.5%	4.7%	3.9%	2.8%	4.4%	2.7
	ScD	.	.	.	.	4.1%	4.2%	4.2%	3.8%	3.2%	3.9%	2.4
Ireland	ScA	.	.	.	.	6.9%	4.0%	4.4%	3.1%	2.9%	4.5%	2.8
	ScB	.	.	.	.	5.1%	3.0%	4.0%	2.9%	2.5%	3.7%	2.3
	ScC	2.8%	6.6%	5.4%	5.9%	5.1%	2.2%	2.8%	1.9%	1.6%	3.0%	2.0
	ScD	.	.	.	.	3.3%	2.1%	2.6%	2.2%	1.9%	2.6%	1.8
Italy	ScA	.	.	.	.	5.1%	3.1%	3.5%	2.3%	2.1%	3.4%	2.2
	ScB	.	.	.	.	3.6%	2.7%	3.1%	2.4%	1.6%	2.8%	1.9
	ScC	1.9%	3.8%	4.0%	8.4%	3.6%	2.0%	2.4%	2.0%	1.4%	2.5%	1.7
	ScD	.	.	.	.	2.2%	1.9%	2.2%	1.9%	1.5%	2.0%	1.6
Latvia	ScA	.	.	.	.	9.4%	6.2%	7.2%	5.2%	4.7%	6.8%	4.6
	ScB	.	.	.	.	7.6%	5.2%	6.0%	5.3%	4.4%	5.9%	3.8
	ScC	.	9.1%	13%	15%	7.6%	4.7%	5.7%	5.0%	4.3%	5.8%	3.6
	ScD	.	.	.	.	5.8%	4.8%	4.9%	4.7%	4.1%	5.0%	3.0
Lisbon FIR	ScA	.	.	.	.	6.1%	2.9%	3.7%	3.7%	3.2%	4.3%	2.6
	ScB	.	.	.	.	4.5%	3.6%	2.7%	3.2%	2.6%	3.4%	2.1
	ScC	5.6%	4.5%	5.7%	6.3%	4.5%	2.8%	2.0%	2.5%	2.1%	2.9%	1.9
	ScD	.	.	.	.	2.9%	2.5%	1.7%	2.4%	2.0%	2.3%	1.7
Lithuania	ScA	.	.	.	.	8.1%	5.6%	6.6%	5.5%	4.8%	6.4%	4.2
	ScB	.	.	.	.	6.6%	4.7%	5.7%	5.8%	4.6%	5.7%	3.6
	ScC	.	10%	6.0%	15%	6.6%	4.3%	5.6%	5.7%	4.6%	5.7%	3.6
	ScD	.	.	.	.	5.1%	5.0%	4.8%	5.2%	4.4%	4.9%	3.0

		2004	2005	2006	2007	2014 / 2008	2015	2020 / 2016	2025 / 2021	2030 / 2026	AAGR 2030/ 2007	Traffic Multiple 2030/ 2007
Malta	ScA	.	.	.	.	6.5%	4.2%	5.2%	4.0%	3.9%	5.0%	3.1
	ScB	.	.	.	.	5.0%	3.9%	4.4%	3.5%	3.0%	4.1%	2.5
	ScC	4.7%	2.9%	0.2%	8.1%	5.0%	3.4%	4.1%	3.3%	3.0%	4.0%	2.4
	ScD	.	.	.	.	3.7%	3.1%	3.5%	3.1%	2.7%	3.3%	2.1
Moldova	ScA	.	.	.	.	10%	7.2%	7.6%	5.5%	4.9%	7.3%	5.0
	ScB	.	.	.	.	8.2%	6.4%	6.4%	5.4%	4.5%	6.3%	4.1
	ScC	16%	8.9%	7.8%	25%	8.2%	5.9%	6.4%	5.6%	4.6%	6.3%	4.1
	ScD	.	.	.	.	6.5%	5.4%	5.5%	5.0%	4.4%	5.5%	3.4
Netherlands	ScA	.	.	.	.	4.7%	2.6%	5.1%	1.9%	1.6%	3.4%	2.2
	ScB	.	.	.	.	3.7%	2.8%	3.9%	2.8%	1.5%	3.0%	2.0
	ScC	4.9%	2.9%	6.0%	4.9%	3.7%	2.4%	3.3%	2.3%	1.5%	2.8%	1.9
	ScD	.	.	.	.	2.3%	2.1%	2.6%	2.2%	1.8%	2.2%	1.7
Norway	ScA	.	.	.	.	3.9%	3.1%	3.3%	2.6%	1.3%	2.9%	1.9
	ScB	.	.	.	.	2.7%	2.3%	2.5%	2.2%	1.8%	2.3%	1.7
	ScC	5.6%	3.6%	6.1%	4.5%	2.7%	1.5%	1.7%	1.5%	1.1%	1.8%	1.5
	ScD	.	.	.	.	1.5%	1.6%	1.7%	1.6%	1.2%	1.5%	1.4
Poland	ScA	.	.	.	.	9.4%	6.5%	6.5%	4.4%	3.9%	6.3%	4.1
	ScB	.	.	.	.	7.1%	5.5%	5.9%	5.2%	4.2%	5.7%	3.6
	ScC	21%	16%	16%	13%	7.1%	4.9%	5.4%	4.9%	4.0%	5.5%	3.4
	ScD	.	.	.	.	5.0%	4.7%	4.8%	4.5%	4.1%	4.6%	2.8
Romania	ScA	.	.	.	.	9.0%	5.9%	6.6%	4.6%	3.7%	6.2%	4.0
	ScB	.	.	.	.	7.2%	5.5%	5.6%	4.6%	3.6%	5.4%	3.4
	ScC	14%	10%	13%	4.0%	7.2%	4.9%	5.0%	4.2%	3.3%	5.1%	3.2
	ScD	.	.	.	.	5.3%	4.6%	4.6%	4.1%	3.5%	4.5%	2.7
Santa Maria FIR	ScA	.	.	.	.	5.7%	3.4%	5.6%	4.4%	4.3%	5.0%	3.1
	ScB	.	.	.	.	4.4%	3.3%	3.9%	3.4%	3.0%	3.7%	2.3
	ScC	4.2%	3.5%	0.9%	1.7%	4.4%	2.9%	3.0%	2.5%	2.3%	3.2%	2.0
	ScD	.	.	.	.	3.1%	2.1%	2.1%	1.9%	1.8%	2.3%	1.7
Serbia&Montenegro	ScA	.	.	.	.	6.8%	4.8%	5.1%	3.0%	2.4%	4.6%	2.8
	ScB	.	.	.	.	5.3%	4.8%	5.3%	3.3%	2.1%	4.1%	2.5
	ScC	19%	15%	8.7%	16%	5.3%	4.1%	4.1%	3.5%	1.9%	3.9%	2.4
	ScD	.	.	.	.	3.8%	3.9%	3.8%	3.5%	2.7%	3.5%	2.2
Slovakia	ScA	.	.	.	.	8.0%	5.8%	6.5%	4.0%	3.1%	5.6%	3.5
	ScB	.	.	.	.	6.2%	5.0%	5.4%	4.5%	3.2%	4.9%	3.0
	ScC	22%	12%	3.8%	-1.6%	6.2%	4.4%	4.8%	4.2%	2.9%	4.7%	2.9
	ScD	.	.	.	.	4.4%	4.1%	4.3%	3.9%	3.3%	4.0%	2.5

		2004	2005	2006	2007	2014 / 2008	2015	2020 / 2016	2025 / 2021	2030 / 2026	AAGR 2030/ 2007	Traffic Multiple 2030/ 2007
Slovenia	ScA	.	.	.	.	6.4%	5.1%	5.1%	3.1%	2.8%	<b>4.5%</b>	<b>2.8</b>
	ScB	.	.	.	.	4.9%	4.5%	4.5%	3.4%	2.4%	<b>3.9%</b>	<b>2.4</b>
	ScC	16%	16%	3.8%	15%	4.9%	3.9%	3.7%	3.1%	2.2%	<b>3.6%</b>	<b>2.3</b>
	ScD	.	.	.	.	3.3%	3.9%	3.6%	3.1%	2.5%	<b>3.2%</b>	<b>2.1</b>
Spain	ScA	.	.	.	.	5.9%	2.8%	3.6%	2.8%	2.3%	<b>3.8%</b>	<b>2.4</b>
	ScB	.	.	.	.	4.3%	3.4%	2.7%	2.9%	2.0%	<b>3.1%</b>	<b>2.0</b>
	ScC	6.2%	6.2%	5.2%	8.4%	4.3%	2.5%	1.8%	2.2%	1.8%	<b>2.7%</b>	<b>1.8</b>
	ScD	.	.	.	.	2.7%	2.6%	1.8%	2.4%	2.0%	<b>2.3%</b>	<b>1.7</b>
Sweden	ScA	.	.	.	.	4.8%	3.8%	4.0%	3.3%	2.6%	<b>3.8%</b>	<b>2.4</b>
	ScB	.	.	.	.	4.0%	3.3%	3.0%	3.3%	2.7%	<b>3.3%</b>	<b>2.1</b>
	ScC	9.0%	-0.1%	3.8%	2.8%	4.0%	2.7%	2.5%	2.8%	2.4%	<b>3.0%</b>	<b>2.0</b>
	ScD	.	.	.	.	2.5%	2.5%	2.0%	2.7%	2.3%	<b>2.4%</b>	<b>1.7</b>
Switzerland	ScA	.	.	.	.	4.8%	2.5%	2.4%	1.5%	2.1%	<b>2.9%</b>	<b>1.9</b>
	ScB	.	.	.	.	3.6%	2.7%	2.7%	1.7%	1.5%	<b>2.5%</b>	<b>1.8</b>
	ScC	3.0%	3.1%	2.4%	5.9%	3.6%	2.1%	2.3%	1.5%	1.2%	<b>2.2%</b>	<b>1.7</b>
	ScD	.	.	.	.	2.2%	2.0%	2.1%	1.8%	1.4%	<b>1.9%</b>	<b>1.5</b>
Turkey	ScA	.	.	.	.	8.1%	5.4%	5.5%	3.8%	3.2%	<b>5.4%</b>	<b>3.3</b>
	ScB	.	.	.	.	6.8%	6.2%	5.2%	4.0%	2.9%	<b>5.0%</b>	<b>3.1</b>
	ScC	19%	14%	8.0%	9.2%	6.8%	5.7%	4.5%	4.1%	2.9%	<b>4.8%</b>	<b>2.9</b>
	ScD	.	.	.	.	5.5%	5.4%	4.6%	4.0%	2.9%	<b>4.4%</b>	<b>2.7</b>
Ukraine	ScA	.	.	.	.	9.3%	7.4%	8.0%	5.7%	5.4%	<b>7.3%</b>	<b>5.1</b>
	ScB	.	.	.	.	7.7%	6.5%	6.8%	5.5%	4.8%	<b>6.3%</b>	<b>4.1</b>
	ScC	.	9.3%	1.3%	8.2%	7.7%	6.2%	6.7%	5.8%	4.8%	<b>6.4%</b>	<b>4.1</b>
	ScD	.	.	.	.	6.2%	5.6%	5.7%	5.1%	4.5%	<b>5.5%</b>	<b>3.4</b>
UK	ScA	.	.	.	.	4.1%	2.7%	4.3%	2.4%	2.0%	<b>3.2%</b>	<b>2.1</b>
	ScB	.	.	.	.	3.1%	2.3%	3.7%	2.2%	1.8%	<b>2.7%</b>	<b>1.9</b>
	ScC	5.1%	5.3%	3.4%	3.5%	3.1%	1.8%	3.0%	1.5%	1.1%	<b>2.2%</b>	<b>1.7</b>
	ScD	.	.	.	.	2.0%	1.9%	2.6%	2.0%	1.5%	<b>2.0%</b>	<b>1.6</b>
ESRA	ScA	.	.	.	.	5.2%	3.3%	3.8%	2.6%	2.1%	<b>3.5%</b>	<b>2.2</b>
	ScB	.	.	.	.	3.9%	3.1%	3.1%	2.7%	1.9%	<b>3.0%</b>	<b>2.0</b>
	ScC	4.8%	3.9%	3.9%	5.1%	3.9%	2.4%	2.5%	2.3%	1.7%	<b>2.7%</b>	<b>1.8</b>
	ScD	.	.	.	.	2.5%	2.3%	2.2%	2.3%	1.8%	<b>2.2%</b>	<b>1.7</b>

## ANNEX G. REFERENCES

Electronic version of Refs. 1, 2, 4, 5, 7, 8, 10 is available on [www.eurocontrol.int/statfor](http://www.eurocontrol.int/statfor).

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