

## **Section 4**

# **AVIATION SECURITY EXPENDITURE**

**September 2004**



<b>CIVIL AVIATION SECURITY FINANCING STUDY</b>	<b>4</b>
<b>Aviation security expenditure</b>	

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## 4 Aviation security expenditure

### 4.1 Summary

#### Aviation security expenditure post 11 September 2001

- This section assesses the security related costs incurred by the key aviation stakeholders (i.e. States, airports and carriers) after 11 September 2001, as well as from the introduction of mandatory requirements contained in Regulation (EC) No 2320/2002.
- Based on the responses, it is estimated that for all the stakeholders, the total security related expenditure in 2002 for the 18 States was in a range between **€2.49bn and €3.63bn**. This is made up of **€0.65bn** for the States, **€1.32bn** for airports and between **€0.52bn and €1.66bn** for carriers. (Note that the carriers figure is incremental, as full costs were not provided by many of the respondents).
- The range in total expenditure is driven by costs associated with cockpit door modifications and more importantly, increases in insurance premiums.

#### Security expenditure – States

- Security related expenditure for the States was polarised around the two models:
  - **Centralised model States** – those States where the primary passenger and baggage screening tasks are the responsibility of a central State body or public authority.
  - **Decentralised model States** – those States where the primary passenger and baggage screening tasks are the responsibility of the airports and airlines.
- The estimated cost of security activities provided by the 18 States was circa **€654m** in 2002. The centralised States accounted for **90%** of the estimated total expenditure, reflecting the different assignment of responsibilities under the two models.
- Germany was estimated to have accounted for **51%** of total expenditure, with Italy, France and the Netherlands accounting for **12%, 10% and 9%** respectively.
- The weighted average expenditure per passenger of **€1.14** across the 18 States is **84%** of the centralised average (**€1.36**) and **243%** of the decentralised average (**€0.47**). The decentralised weighted average was **35%** of the centralised weighted average.

#### Security expenditure - airports

- For the 34 responding airports, operational expenditure was around **€457m** in 2000. By 2001, this had risen by almost **€116m to €573m** (an almost **25%** increase). Most of this increase was a result of costs incurred during the final quarter of 2001 due to the measures introduced immediately after the 11 September terrorist attacks. During the same time period traffic declined by **1.6%** for the airports in the 18 States.
- The full impact of this increase became evident in 2002 when a further increase of **30%** was experienced (to **€743m**) for the reporting airports.

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- Direct security costs accounted for the majority of the cost increases. During 2002, labour related expenditure (including labour costs from own security staff and outsourcing security to third parties) represented **59%** of total airport security related expenditure. Labour expenditure is particularly high at those airports responsible for providing passenger and baggage screening.
- Small to medium airports reported larger percentage increases in incremental security related expenditure than the larger airports.
- Increases in incremental security related expenditure were significantly more than traffic increases at the majority of the airports surveyed. Many airports recorded sharp increases in security related expenditure in spite of flat or reducing traffic between 2001 and 2002.
- Unit costs (security related operational expenditure per passenger) vary widely between airports. This is driven by whether the airport provides passenger and baggage screening activities or if these activities are provided by the State.
- The weighted average per passenger security related cost in 2002 was as follows:
  - **Decentralised model** (where the airport is responsible for the screening of passengers and bags) was **€2.07**.
  - **Centralised model** (where the State is responsible for screening passengers and bags) the cost is **€1.10**.
  - **Combined** average for both models was **€1.52**.
- Irrespective of whether the airport or the State was responsible for screening passengers and bags, unit costs were not significantly higher at small / medium size airports compared with the larger airports in the study.

#### **Airport capital investment**

- Investment in security related capital items has risen significantly for the responding airports during 2000 and 2002; rising from **€32m** to **€179m**. **70%** of investments made by the airports in 2002 were for equipment related acquisitions (i.e. EDS, x-rays, CCTV, biometric scanners, etc). The remaining **30%** was mainly for terminal related redevelopments.
- Average capital expenditure per passenger doubled from **€0.23** to **€0.58** between 2001 and 2002.
- The per passenger capital investment level appears to be proportionately much higher for small airports.

#### **Estimated airport total expenditure**

- Estimates for incremental security related expenditure for European airports are weighted based on whether airports are responsible for providing key activities such as passenger and baggage screening. Total estimated incremental security related expenditure was **€1.3bn** in 2002 for around 400 airports across Europe.
- Airports responsible for screening activities (decentralised model) accounted for 43% of total passenger throughputs and **71%** of the cost in the 18 States. Airports where screening activities are provided by the State (centralised model) incurred **29%** of the cost but handled **57%** of the passengers in the 18 States in 2002.

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#### Security expenditure - carriers

- Nineteen carriers responded in detail to the questionnaire. These represent **48% (231m)** of total European carrier traffic throughput. Security related incremental expenditure for these carriers rose by **€182m** in 2001 over 2000 levels and by a further **€493m** in 2002 over 2001.
- Insurance expenses represented **50%** of the total incremental costs in 2002. This almost tripled from **€84m** in 2001 over 2000 to **€249m** in 2002 over 2001 for the responding carriers.
- Reinforcing of aircraft cockpit doors accounted for **28%** of the incremental costs incurred in 2002 over 2001. The total incremental cockpit door costs for the 19 carriers were **€134m**. From the responses, it would appear that most of this type of expenditure was incurred in 2002.
- During 2002, incremental IT activities relating to the collection of passenger data and passenger / bag reconciliation accounted for **€26m (5%)** of incremental costs.
- Increased surveillance including the protection of aircraft and incremental security staff contributed **€42m (8%)** of 2002 incremental costs.
- The weighted average incremental cost per passenger for the responding carriers increased from **€0.99** in 2001 over 2000 to **€2.49** in 2002 over 2001.
- Large network carriers including SAS, KLM and British Airways reported incremental security related costs per passenger of **€3.98**, **€3.82** and **€2.57** respectively in 2002 over 2001 levels.
- When the cost of modifying cockpit doors is excluded, the weighted average cost was **€1.81** per passenger for 2002 compared to **€2.49** when all incremental costs were included. By removing this "one off" cost, it could be argued that this represents a more appropriate view of carrier incremental security costs on an ongoing basis.
- To illustrate the impact of insurance on unit costs, when the incremental cost of insurance and modifying cockpit doors is excluded, the weighted average cost per passenger reduced from **€0.99** to **€0.53** in 2001 (a reduction of **-46%**). In 2002 the reduction was from **€2.49** to **€0.55** per passenger (**-78%**).
- Based on the weighted averages calculated from the sample responses, the incremental costs of increased security measures on European carriers as a whole are estimated to have totalled **€0.5bn** and **€1.7bn (€0.5bn+€1.2bn)** in 2001 and 2002 respectively. An estimated **€2.1bn** of incremental cost has been incurred by European carriers as a result of security related measures and increased cost of insurance cover between 2000 and 2002.

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## 4.2 Introduction

This section assesses the security related costs incurred by the key aviation stakeholders (i.e. States, airports and carriers) after 11 September 2001, as well as from the introduction of mandatory requirements contained in Regulation (EC) No 2320/2002.

A review of the increases in security related unit costs for the period 2000 to 2002 is included. For several airports and carriers, security related unit costs have increased significantly in a period when passenger throughputs have remained flat or were in decline.

The State section includes an analysis of security related expenditure advised by the 18 States. Where expenditure has not been provided, assumptions have been made based on the estimated level of security related taxation income for each State.

The airport section includes an analysis of security related operational and capital expenditures. There is also a comparison of security related unit costs for those airports responsible for the provision of key security activities such as passenger and baggage screening against those airports where these activities are the responsibility of the State (decentralised versus centralised models as outlined in Section 3).

The carrier section provides an overview of the financial impact of incremental security costs on different types of carriers (i.e. full network or hub carriers, regional, charter and no frills carriers). The financial impact of insurance increases after 11 September 2001 is assessed as well as the impact of new requirements including reinforcement of aircraft cockpit doors.

An estimation of the total incremental security related expenditure for European carriers as a whole, as well as for the membership of the Association of European Airlines (AEA), is included.

Total traffic for European airports (with passenger throughputs above 5,000 per annum) in the 18 States totalled 938m in 2002<sup>1</sup>. The overall total for Europe was 990 million in 2002, based on ACI statistics. It should be noted that airport throughput figures double count the number of passengers travelling within Europe as the same passenger is counted as one passenger by the departing airport and another passenger by the arriving airport.

The estimated total passengers carried by carriers (i.e. full network, charter, regional and no frills carriers) based in the 18 States totalled 483m in 2002.

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<sup>1</sup> The figures for Greece only include Athens International Airport, as figures were not provided for any other Greek airport.



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## 4.3 State security expenditure

### 4.3.1 Introduction

This section provides an overview of the costs incurred by the 18 States for the provision of aviation security activities in 2002. The section is structured to reflect:

- **Centralised model States** - those States where the primary passenger and baggage screening tasks are the responsibility of a central State body or public authority.
- **Decentralised model States** – those States where the primary passenger and baggage screening tasks are the responsibility of the airports and airlines.

As a result of incomplete financial information received from a number of States, assumptions were made in undertaking this analysis. The principal assumption in this section is that the level of State expenditure broadly equates to the level of security taxes levied by the individual States. State taxation is covered in detail in sections 5 and 6. Where States have provided details of expenditure, this has been included in the analysis.

### 4.3.2 Centralised model states

Twelve States can be classified as adopting the centralised model of airport security provision in 2002. The Netherlands reverted to the decentralised model from April 2003, but for the purposes of this analysis of 2002 financials, the Netherlands is included in the centralised model.

It is estimated that security related expenditure during 2002 was circa €589m for the 12 States under the centralised model. This resulted in a weighted average of €1.36 per passenger.

**Figure 4-1: Centralised model: Estimated State operating expenditure (2002)**

STATES EXPENDITURE		2002	
	State expenditure € m	State traffic (all airports) m pax	Average State cost per pax € per pax
Austria	32.7	16	2.09
Finland	0.0	0	0.00
Germany	333.1	94	3.56
Iceland	0.3	2	0.13
Italy	82.3	88	0.94
Luxembourg	13.5	2	8.87
Netherlands	56.5	42	1.35
Norway	0.0	0	0.00
Portugal	25.0	20	1.22
Spain	38.5	143	0.27
Sweden	0.0	0	0.00
Switzerland	7.5	29	0.26
<b>Total Centralised Model</b>	<b>589.4</b>	<b>435</b>	<b>1.36</b>

Note: It is assumed that the level of expenditure for State equates to the level of tax income as outlined in sections 5 and 6. A similar assumption was made for Spain, although receipts come from a share of airport security charges.

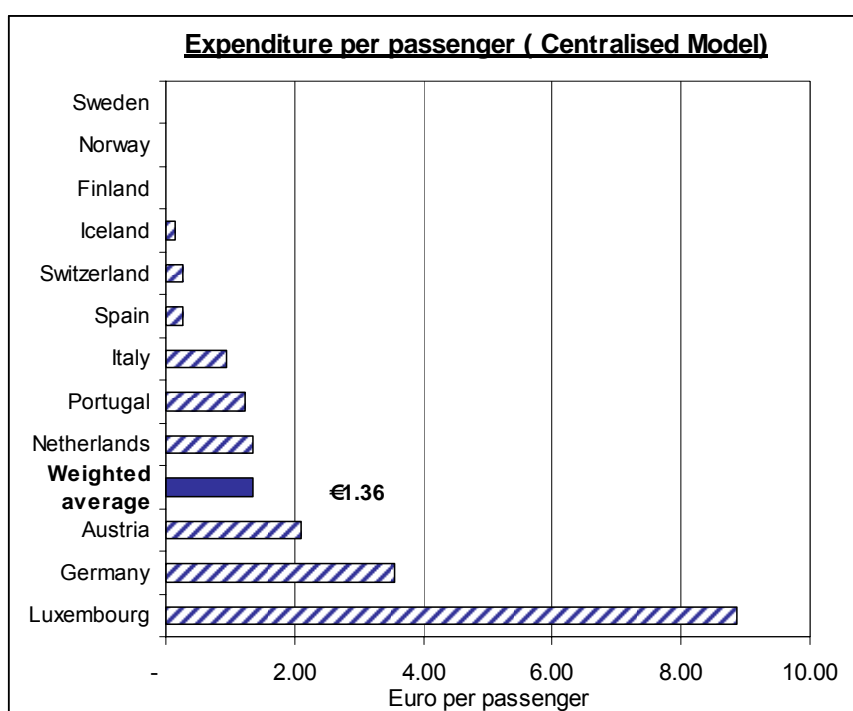
Source: IAA/AviaSolutions estimates based on security questionnaire responses

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Where a State does not levy taxes or did not provide details of expenditure, no estimate was made of security related expenditure (Finland, Norway and Sweden). These States have been excluded from the calculation of a weighted average per passenger level of expenditure for the States under the centralised model.

The estimated average expenditure for each of the States varies from €0.13 per passenger in Iceland to €8.87 in Luxembourg. Germany recorded the largest expenditure in 2002 at €333m, an average of €3.56 per passenger. The Netherlands had an estimated expenditure of circa €57m in 2002 however this expenditure ceased from April 2003 as the Netherlands transferred responsibility for passenger and baggage screening to the airports and thereafter followed the decentralised model.

**Figure 4-2: Centralised Model: Estimated State operating expenditure per passenger (2002)**



Source: IAA/AviaSolutions estimates based on security questionnaire responses

### 4.3.3 Decentralised model States

Six States applied the decentralised model in 2002 with key security activities (passenger and baggage screening) being the responsibility of the airports and airlines rather than a centralised governmental body.

As shown in the figure below, other than the €62m reported by the French DGAC, Belgium is the only other State to have reported operational expenditure (€2.7m) in 2002. Belgium's regional governments are responsible for funding security at regional airports (i.e. Antwerp, Charleroi, Liege and Ostend); however, the expenditure included is for the Flemish region comprising Antwerp and Ostend airports only.

The weighted average security related expenditure was €0.47 per passenger in 2002. This is 35% of the weighted average under the centralised model (€1.36 per passenger).

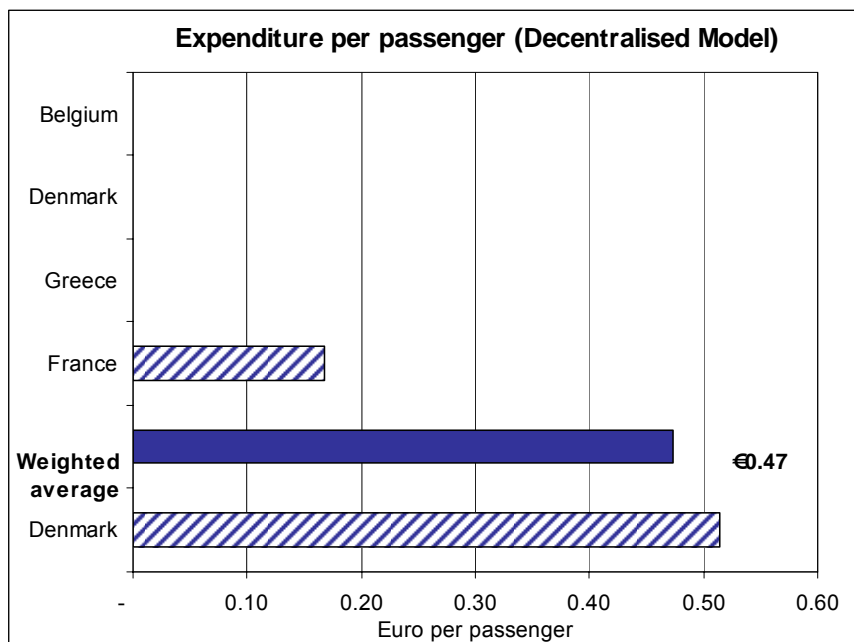
**Figure 4-3: Decentralised Model: Estimated State operating expenditure (2002)**

<b>STATES EXPENDITURE</b>		<b>2002</b>	
	State expenditure € m	State traffic (all airports) m pax	Average State cost per pax € per pax
Belgium	2.7	16	0.17
Denmark	0.0	0	0.00
France	62.0	121	0.51
Greece	0.0	0	0.00
Ireland	0.0	0	0.00
United Kingdom	0.0	0	0.00
<b>Total Decentralised Model</b>	<b>64.7</b>	<b>137</b>	<b>0.47</b>

Source: IAA/AviaSolutions estimates based on security questionnaire responses

Note: This figure does not reflect any security operational expenditure incurred by Greek regional airports. Throughputs from States not levying any security related taxes (Denmark, Ireland and the UK) are omitted in the estimation of the weighted passenger average expenditure.

**Figure 4-4: Decentralised Model: Estimated State operating expenditure per passenger (2002)**



Source: IAA/AviaSolutions estimates based on security questionnaire responses

#### 4.3.4 Centralised and decentralised models - Combined State position

By combining all of the State results under both models, it is possible to estimate the cost of security activities provided by the 18 States. This was estimated to be around €654m in 2002. The centralised States accounted for 90% of estimated expenditure, which reflects the relative responsibilities under the two models.

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**Figure 4-5: Combined Position: Estimated State expenditure (2002)**

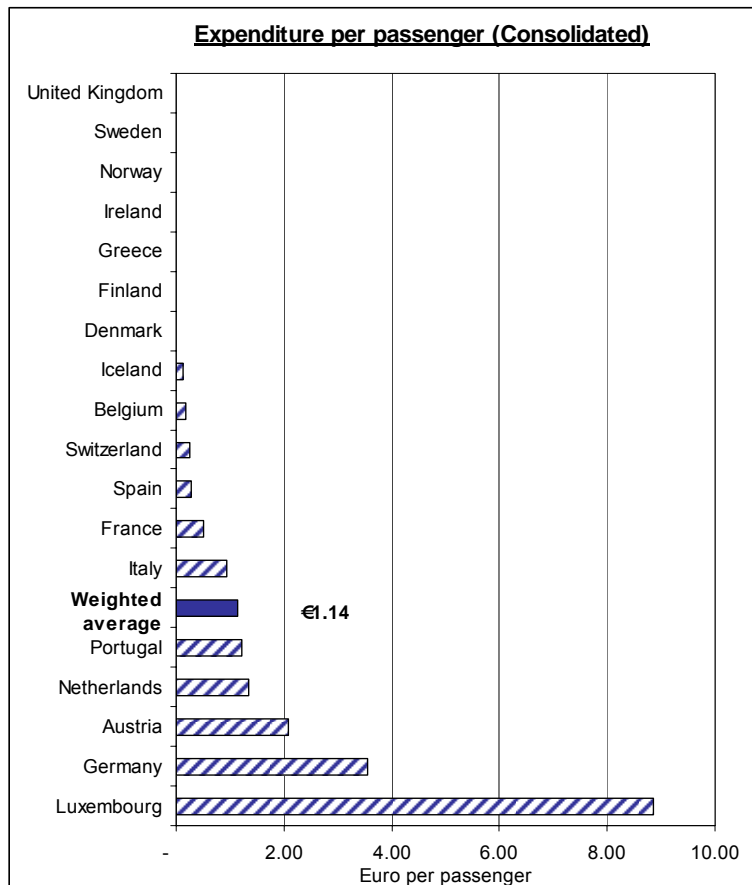
<b>STATES EXPENDITURE</b>		<b>2002</b>	
	<b>State expenditure € m</b>	<b>State traffic (all airports) m pax</b>	<b>Average State cost per pax € per pax</b>
Austria	32.7	16	2.09
Belgium	2.7	16	0.17
Denmark	0.0	0	0.00
Finland	0.0	0	0.00
France	62.0	121	0.51
Germany	333.1	94	3.56
Greece	0.0	0	0.00
Iceland	0.3	2	0.13
Ireland	0.0	0	0.00
Italy	82.3	88	0.94
Luxembourg	13.5	2	8.87
Netherlands	56.5	42	1.35
Norway	0.0	0	0.00
Portugal	25.0	20	1.22
Spain	38.5	143	0.27
Sweden	0.0	0	0.00
Switzerland	7.5	29	0.26
United Kingdom	0.0	0	0.00
<b>Total</b>	<b>654.1</b>	<b>571</b>	<b>1.14</b>

Source: IAA/AviaSolutions estimates based on security questionnaire responses

Note: Throughput of 571m for passengers in the States is used to calculate the weighted average cost. Where the State has confirmed that it does not incur any direct expenditure, the passengers in that State have been excluded from the calculation of the weighted average.

The weighted average expenditure per passenger of €1.14 is 84% of the centralised average and 243% of the decentralised average.

**Figure 4-6: Combined Position: Estimated State operating expenditure per passenger (2002)**



Source: IAA/AviaSolutions estimates based on security questionnaire responses

## 4.4 Airport security expenditure

### 4.4.1 Introduction

This section outlines the financial impact on European airports of increased security measures in the aftermath of the 11 September 2001 terrorist attacks. It illustrates the increase in costs of security related activities between 2000 and 2002.

There is also a comparison of per passenger unit costs for airports under the decentralised model which have responsibility for the majority of the costs related to security activities (including passenger and baggage screening) versus airports under the centralised model where the provision of a number of security activities are the responsibility of another party (e.g. State authority, police services, etc).

This section is based on a sample of airports and carriers participating in the study. The proportion of airports providing responses represents around 56% of airport throughputs for the 18 States and 53% of total European airport traffic.

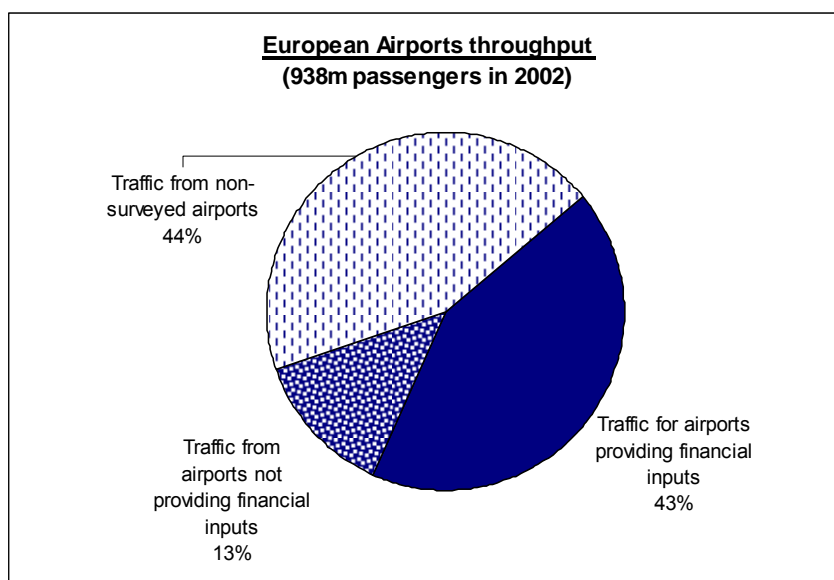
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#### 4.4.2 Aviation security expenditure inputs

The key output from the airport security questionnaire was to be able to ascertain the level of operational and capital expenditure related to security activities over the last 3 financial years (i.e. FY2000, FY2001 and FY2002). From 41 airport groups or companies surveyed as part of the stakeholder consultation process, 34 questionnaires representing 42 airports were returned. Detailed financial information on operational and capital expenditure related to security activities were provided for 36 airports. The findings outlined in this section are entirely based on the inputs provided by these airports.

The 36 airports providing security related financial information handled around 43% of traffic for the 18 States during 2002 (i.e. 402 airports within the 18 States with traffic throughput above 5,000 passengers p.a.). This representative sample includes most of Europe's largest airports.

**Figure 4-7: Proportion of respondents from total European airport traffic (2002)**



Source: Airport security questionnaires and ACI European traffic statistics for 2002

Those airports that completed the airport security questionnaire but did not include any financial security related costs account for a further 13% of total European traffic. Among the key airport bodies that did not provide financial information are Vienna Flughafen AG, Aeroporti di Roma (Fiumicino and Ciampino) and Aena (Madrid, Bilbao and Santander airports).

The security related operational expenditure information is disaggregated into 2 major groups: direct and indirect costs. The following direct and indirect cost categories were included.

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**Figure 4-8: Direct versus indirect airport cost categories**

<b>Direct costs</b>	<b>Indirect costs</b>
1. Insurance	1. Staff background checks
2. Labour costs	2. Training
3. Outsourcing	3. Information Technology (IT)
4. Police	4. Others
5. Maintenance	
6. Depreciation	
7. Others	

Source: Airport security questionnaires

Respondents were requested to include only the proportion of expenditure related to security activities. For example, labour costs should reflect costs associated with security staff only; and training costs should only relate to those of a security nature.

The following figure summarises the cost categories provided by each of the respondents.

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**Figure 4-9: Airports providing financial inputs – cost category breakdown**

State	Code	Airport	Size	Insurance	Labour costs	Outsourcing	Police	Maintenance	Depreciation	Others direct	Background checks	Training	Information technology	Others indirect	Capex - Equipment	Capex - Terminal
Austria	VIE	Vienna	L													
	GRZ	Graz	S													
Belgium	BRU	Brussels	L	✓	✓	✓	✓	✓	✓		✓			✓		
	CRL	Charleroi	M			✓	✓	✓	✓							
Denmark	CPH	Copenhagen	L													
France	CDG	Charles De Gaulle	L	✓	✓	✓	✓	✓	✓				✓	✓		✓
	ORY	Orly	L													
Finland	HEL	Helsinki	L		✓	✓	✓			✓				✓		
Germany	FRA	Frankfurt	L		✓		✓	✓		✓	✓	✓	✓	✓		
Greece	ATH	Athens	L	✓	✓	✓			✓							✓
Ireland	DUB	Dublin	L	✓	✓									✓	✓	✓
	SNN	Shannon	M	✓	✓									✓	✓	✓
	ORK	Cork	M	✓	✓									✓	✓	✓
	KRY	Co. Kerry	S	✓	✓		✓	✓		✓				✓	✓	✓
Italy	TRN	Turin	M		✓	✓	✓	✓						✓		
	FLR	Florence	S	✓	✓	✓										
Netherlands	AMS	Schiphol	L		✓	✓			✓					✓		✓
	RTM	Rotterdam	S		✓	✓								✓		
	EIN	Eindhoven	S		✓	✓	✓	✓			✓			✓	✓	✓
Norway	OSL	Avinor	G		✓									✓	✓	✓
Portugal	LIS	Lisbon	L	✓		✓	✓	✓	✓		✓	✓	✓	✓		
	OPO	Porto	M			✓	✓	✓	✓					✓		
Sweden	ARL	Stockholm	L	✓	✓	✓	✓	✓	✓		✓	✓	✓			
	MMX	Malmö	M	✓	✓	✓	✓	✓		✓		✓	✓			
Switzerland	ZRH	Zurich	L	✓		✓	✓	✓	✓					✓		
UK	LHR	Heathrow	L	✓	✓	✓	✓	✓	✓	✓		✓	✓			
	LGW	Gatwick	L	✓	✓	✓	✓	✓	✓	✓		✓	✓			
	STN	Stansted	L	✓	✓	✓	✓	✓	✓			✓	✓			
	GLA	Glasgow	L	✓	✓	✓	✓	✓	✓		✓	✓	✓			
	EDI	Edinburgh	L	✓	✓	✓	✓	✓	✓		✓	✓	✓			
	ABZ	Aberdeen	M	✓	✓	✓	✓	✓	✓		✓	✓	✓			
	NCL	Newcastle	M	✓	✓											
	SOU	Southampton	S	✓	✓	✓	✓	✓			✓	✓	✓			
	BLK	Blackpool	S											✓		
				15	20	16	7	15	15	12	6	4	5	8	17	10

Key: (L) Large: over 5m passenger p.a.; (M) Medium: between 1m and 5m passenger p.a.; (S) Small (under 1m passenger p.a.); (G) Airport group

Source: Airport security questionnaires

#### 4.4.3 Airport operational expenditure

Security related operational expenditure includes those costs related to the provision of security activities by the airport, and reflected in the profit and loss account. All references to operational costs or expenditures in this section are for security related activities as opposed to operational costs or expenditures for the airport business as a whole.

Within this group of operational expenditures, most airports include costs related to the following categories:

- Labour.
- Outsourcing.
- Insurance.



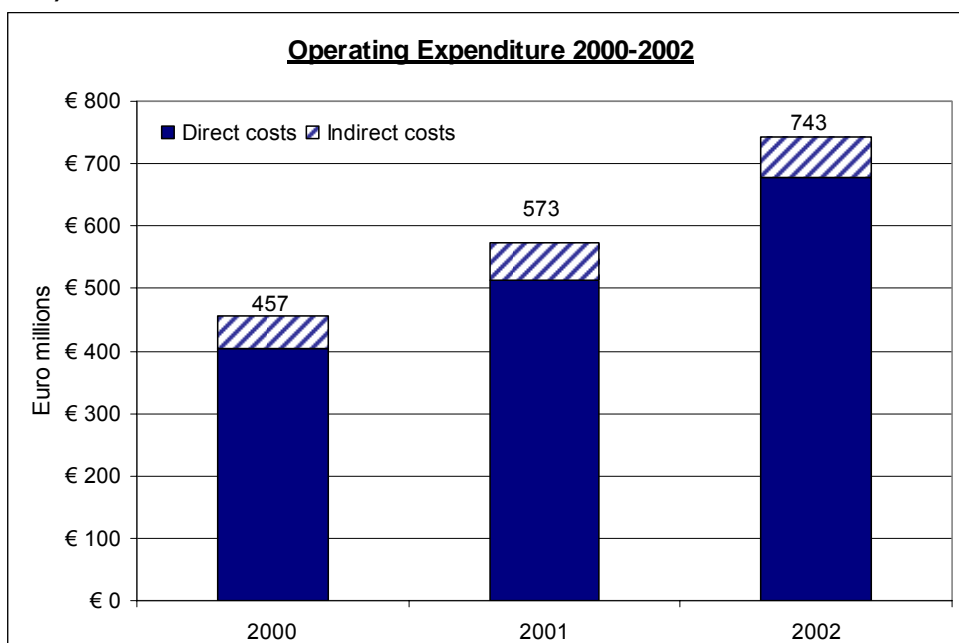
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- Maintenance.
- Depreciation.

For the 34 responding airports, operational expenditure was around €457m in 2000. By 2001, this had risen by almost €116m to €573m (over 25% increase). Most of this increase was a result of costs incurred during the final quarter of 2001 as a result of the measures introduced immediately after the 11 September terrorist attacks. During the same period, traffic declined by 1.6% for the airports in the 18 States.

The full impact of this increase became evident during 2002 when a further €163m increase to €743m, 30% over 2001 levels, was experienced by the reporting airports.

**Figure 4-10: Airport security related operational expenditure – responding airports (2000 to 2002)**



Source: Airport security questionnaires

Direct costs accounted for 91% of airport security expenditure in 2002, while indirect costs accounted for the remaining 9%.

Direct security costs accounted for the majority of the cost increases in 2001 and 2002. Indirect costs have remained relatively flat between €55m and €64m per year, while direct costs have risen by €110m and €160m in each of the years.

#### 4.4.4 Airport security operational expenditure breakdown

In terms of the breakdown of security related operational expenditure, airport direct labour and outsourcing contracts are the 2 major expenditure areas accounting for 32% and 27% in 2002 respectively. Outsourcing mainly comprises the provision of passenger, hand baggage and surveillance responsibilities by a third party (normally a private security firm). As such, labour related

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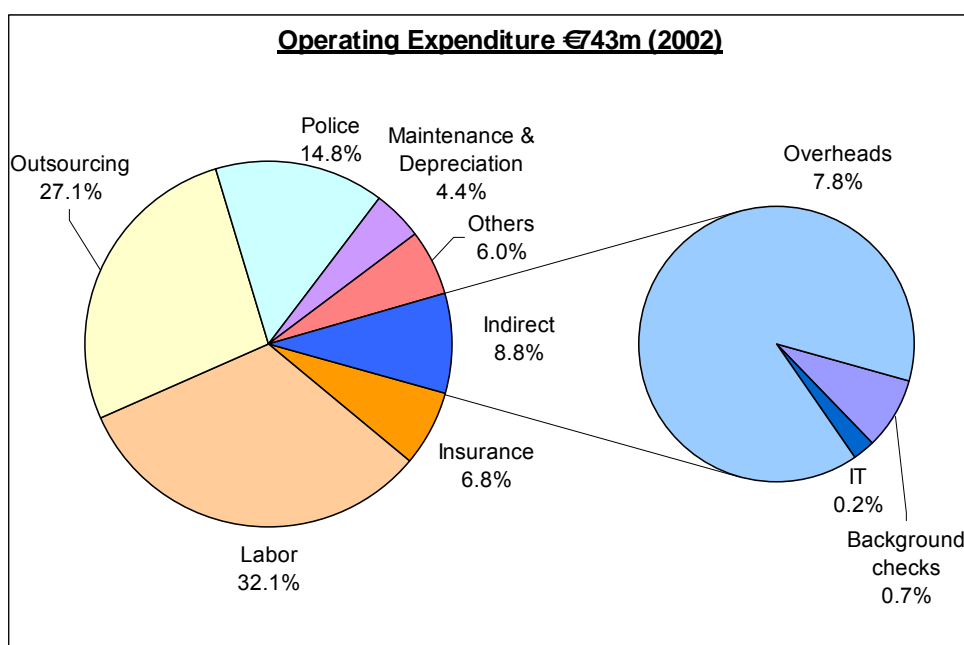
cost is the largest expenditure item in airport security accounting for around 59% of total security operational expenditure for those airports responding to the questionnaire.

Labour costs are followed by police costs, accounting for a further 15%. In several States, including Switzerland and the UK, police undertake certain key airport security activities such as terminal and airport surveillance. The airports generally cover the cost of providing these activities.

Other security operational costs include insurance, maintenance and depreciation representing 7% and 4% of total security operational expenditure respectively.

Indirect costs represent a further 8%, of which company overheads is the largest item accounting for 7% of total security operational expenditure. Expenditure levels on background checks, IT and training are relatively small for those airports providing detailed financial information.

**Figure 4-11: Airport security operational expenditure breakdown (2002)**

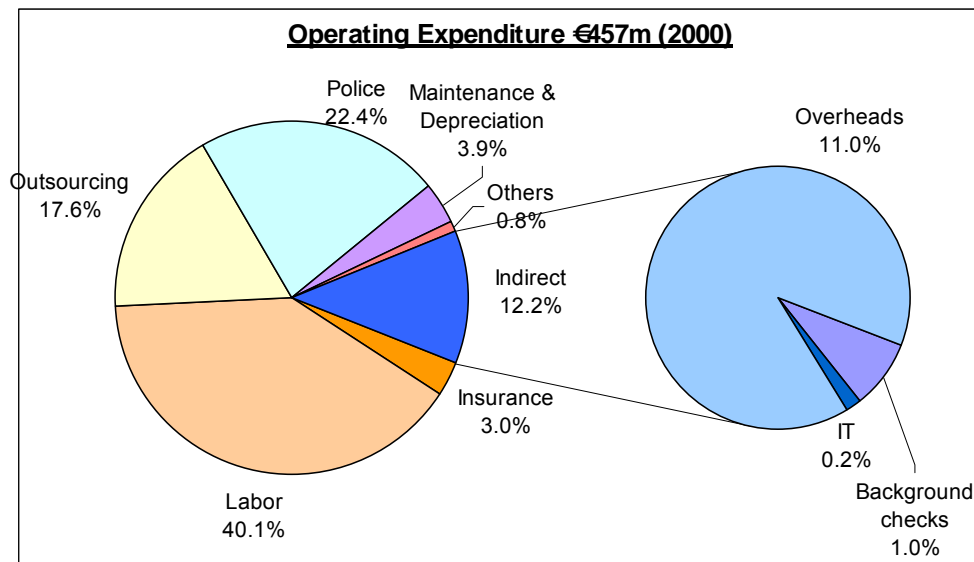


Source: Airport security questionnaires

The weighting of the different costs has slightly changed over the last 3 years. Labour related costs (i.e. labour and outsourcing) remained around the same weight with 58% to 59% between 2000 and 2002; while police expenses declined from 22% to 15% over the period. Insurance costs rose from 3% to 7% reflecting the increased premiums after 11 September 2001.

The weighting of the remaining costs has remained relatively unchanged between 2000 and 2002.

**Figure 4-12: Airport security operational expenditure breakdown (2000)**



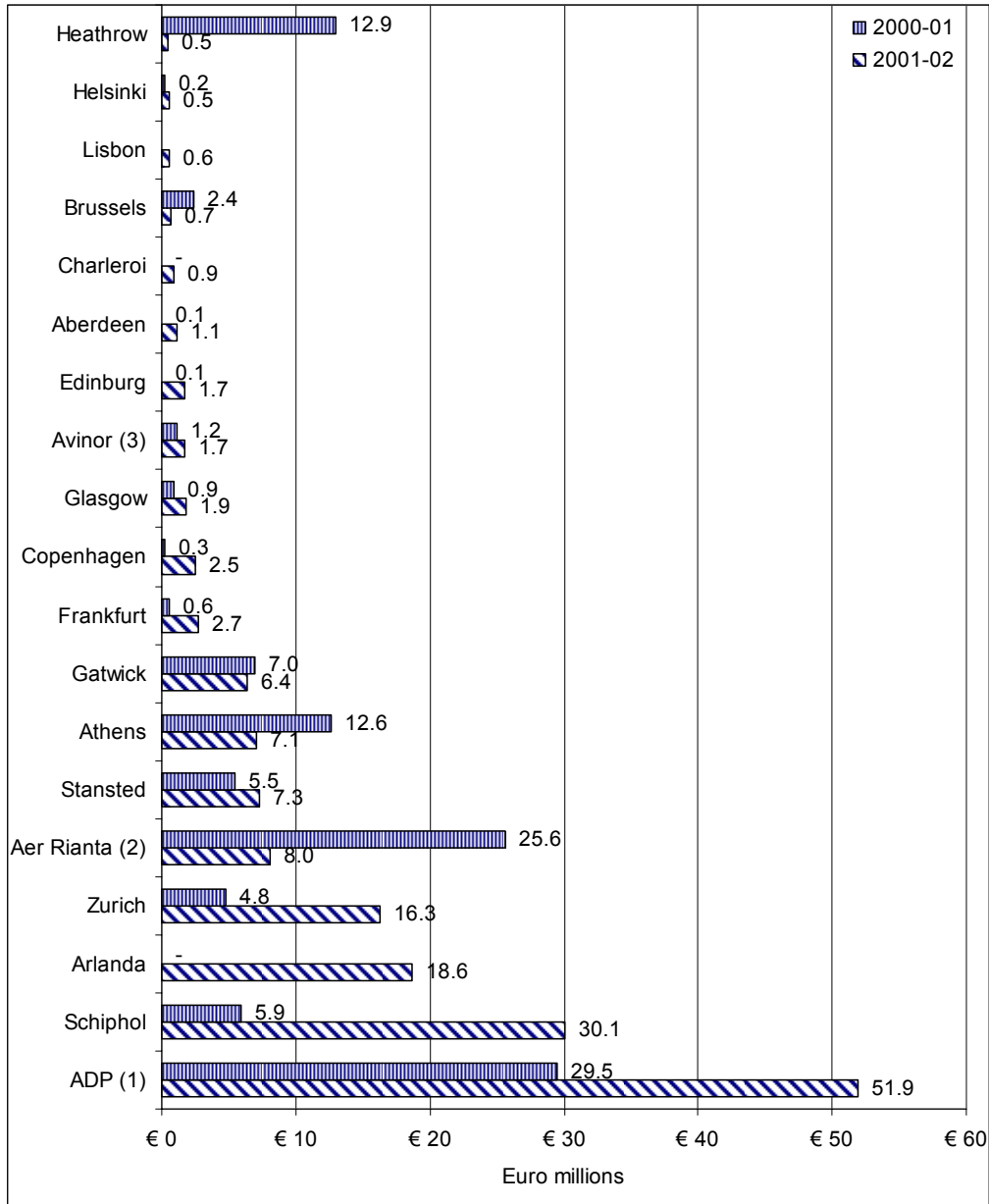
Source: Airport security questionnaires

#### **4.4.5 Airport incremental operational expenditure**

The 34 responding airports have experienced an increase in security costs between 2000 and 2002 of circa €286m.

The following figure illustrates the year on year increase in security expenditure for the responding European airports during the last 3 years. Airports with incremental security related expenditure of less than €0.5m per annum are not shown.

**Figure 4-13: Airport year on year incremental in security related expenditure (2000 to 2002)**



Key: (1) Aéroports de Paris comprises both CDG and Orly airports; (2) Aer Rianta comprises Dublin, Shannon and Cork airports; (3) Avinor comprises security expenditure for the group but primarily Oslo-Gardermoen Airport.

Note: the above chart does not reflect incremental expenditure for Stockholm in 2002 over 2001. For 2001 over 2000, figures were not available for Aer Rianta or Athens (which opened in 2001)

Source: Airport security questionnaires.

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Aéroports de Paris (ADP), the operator of Charles de Gaulle and Orly airports, reported the most significant increases in security expenditure: €30m and €52m from 2000 to 2001 and 2001 to 2002 respectively. This is primarily the result of ADP taking over contracts related to passenger and baggage screening from the French government authority. Outsource expenses for ADP grew from €40m to €112m over the last 3 years (an average annual growth of 67%).

ADP is followed by Amsterdam-Schiphol, Stockholm-Arlanda and Zurich-Kloten airports where security expenditure increases have totalled €30m, €19m and €16m respectively. The costs for Schiphol are expected to increase significantly in 2003 as the airport has taken over security screening responsibilities from the Dutch authorities (Ministry of Justice) from 1<sup>st</sup> April 2003.

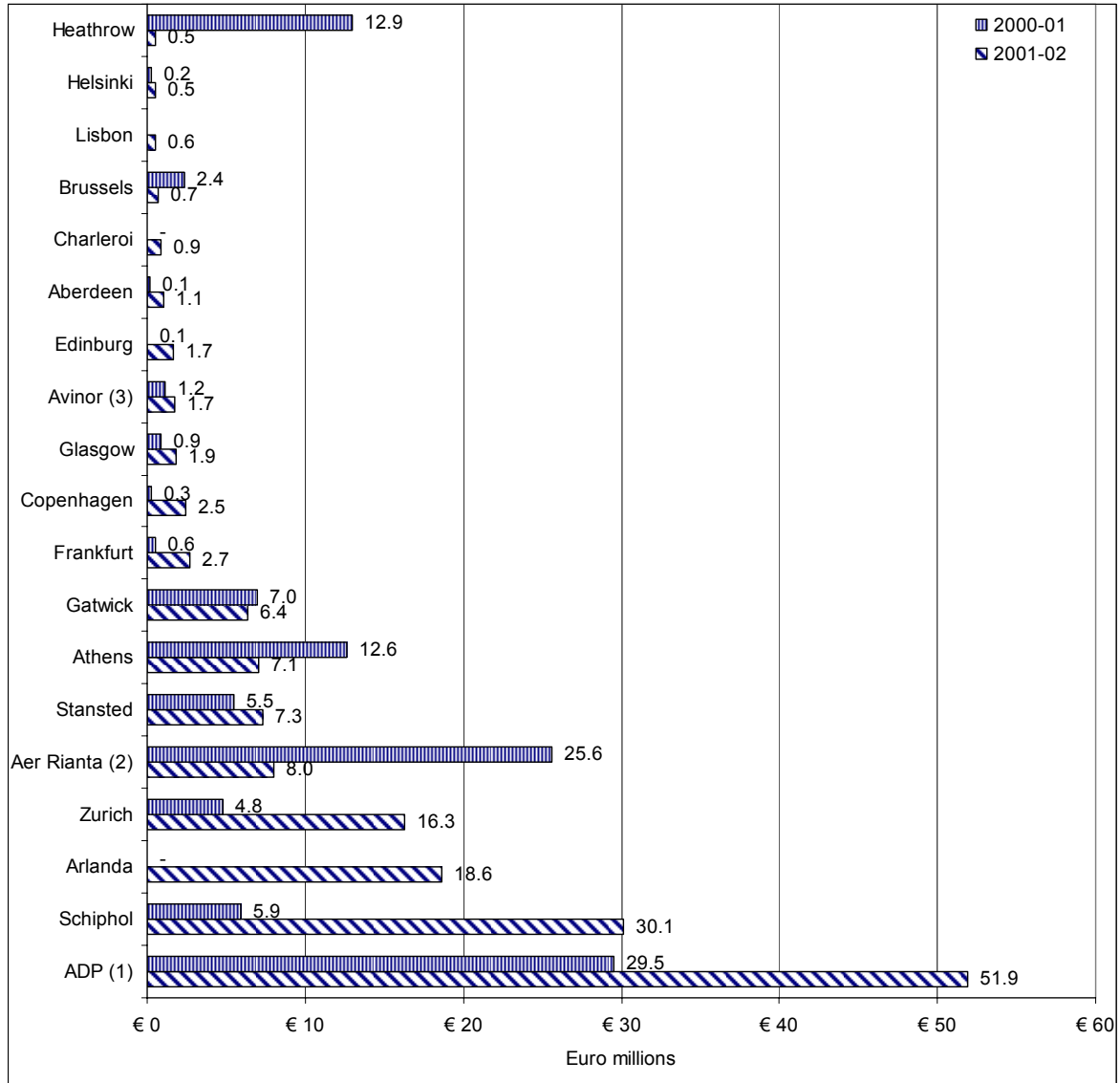
In general, airports have experienced large increases in security related expenditure. These increases have been significantly larger during the period 2001 to 2002 than 2000 to 2001 (€163m versus €116m respectively).

London's Heathrow airport, the largest in Europe, advised a €13m increase in 2001 over 2000. This figure was for their financial year ending 31<sup>st</sup> March 2002 and as such any immediate additional security measures introduced after 11<sup>th</sup> September 2001 would have been incorporated. The 2002 figure did not show a material increase on the previous year's total. The relatively low growth in security costs between 2001 and 2002 may also reflect the UK's aviation security requirements, which were broadly in place for a number of years before the requirements of Regulation (EC) No 2320/2002.

Not surprisingly, the larger airports experienced the biggest absolute increases in security expenditure in 2001 and 2002. However, the rise in security expenditure may well be proportionately more important for the medium and small European airports. This is due to not having large volumes of passengers to spread the impact of costs.

When comparing incremental expenditure as a percentage increase rather than on the actual monetary increase, the ranking of relative impact for each airport changes.

**Figure 4-14: Airport year on year incremental growth (%) in security related expenditure (2000 to 2002)**



Key: (1) Aéroports de Paris comprises both CDG and Orly airports; (2) Aer Rianta comprises Dublin, Shannon and Cork airports; (3) Comprises Avinor security expenditure but primarily Oslo-Gardermoen Airport  
Source: Airport security questionnaires

Smaller airports including Kerry in Ireland, Newcastle in the UK and Turin in Italy have all reported substantial percentage increases in security expenditure.

Increases in expenditure in the period 2001 to 2002 have been significantly higher than over the previous year. Between 2000 and 2001, average increases range from 1% at Edinburgh to 85% at Turin. Between 2001 and 2002, these increases ranged from a minimum of 10% at Eindhoven to a maximum of 147% at Amsterdam-Schiphol and Kerry airports.

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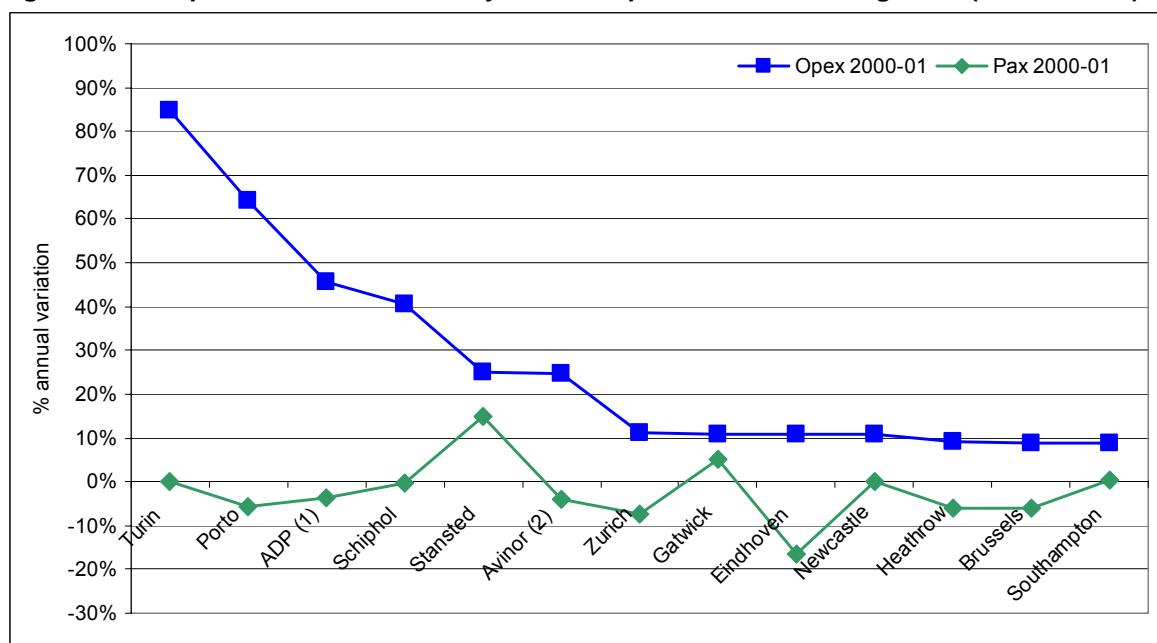
The only airport where security expenditure rose faster in 2001 than in 2002 was Turin (85% vs. 37% respectively). The main reason for the increase was a rise in outsourcing costs from €0.2m to €0.5m between 2000 and 2001 respectively. Whilst the actual monetary values of increased security related expenditure are relatively low for the smaller airports, the impact on profitability and/or financial viability can be significant.

#### 4.4.6 Airport incremental expenditure versus traffic growth

Some security related costs such as terminal and perimeter surveillance could be considered to be fixed costs (driven by an airport's infrastructure rather than traffic throughputs). Other costs such as passenger, baggage and staff screening depend to a larger extent on the airport's passenger and airfreight throughputs (hourly and seasonal distribution are also key factors) and therefore could be deemed as variable or semi-variable costs. Increased throughput is likely to require incremental expenditure on staff and equipment when any excess capacity is fully utilised.

The security expenditure increases experienced by responding airports during the period 2000 to 2002 have been compared to the traffic profile (passenger growth rate) over the same period. The following figures illustrate security expenditure increases versus passenger growth at a sample of airports for 2000 to 2001 and 2001 to 2002.

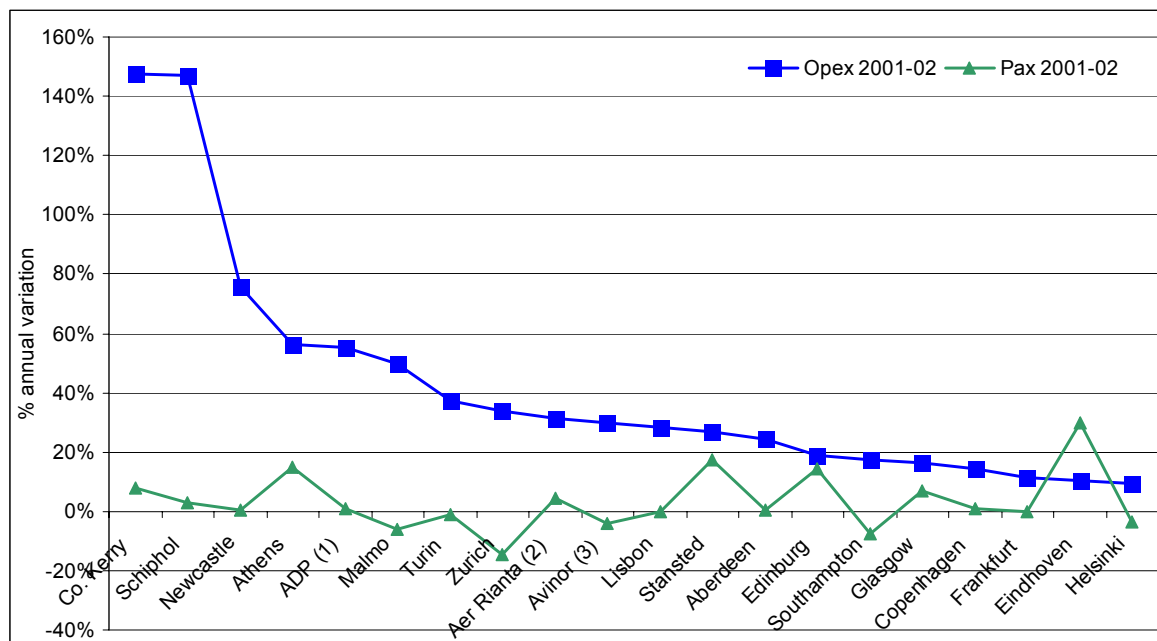
**Figure 4-15: Airport incremental security related expenditure vs. traffic growth (2000 to 2001)**



Key: (1) Aéroports de Paris comprises both CDG and Orly airports. (2) Comprises Avinor security expenditure but primarily Oslo-Gardermoen Airport

Source: Airport security questionnaires

**Figure 4-16: Airport incremental security related expenditure vs. traffic growth (2001 to 2002)**



Key: (1) Aéroports de Paris comprises both CDG and Orly airports. (2) Aer Rianta comprises Dublin, Shannon and Cork airports. (3) Comprises Avinor security expenditure but primarily Oslo-Gardermoen Airport  
Source: Airport security questionnaires

The figures demonstrate that increases in security related expenditure exceed throughput growth rates. For example, Amsterdam-Schiphol, which experienced no traffic growth from 2000 to 2001 and only 3% from 2001 to 2002, reported security expenditure increases of 40% and 147% respectively. The expenditure increases were primarily a result of centralising passenger and hand baggage screening activities. Previously, screening was carried out at the departure gate with the change driven by the transfer of the screening responsibility from the State authority (i.e. Royal Port Police) to the airport in April 2003. Schiphol also introduced 100% staff screening and biometric systems during the last 2 years.

Many other airports, including medium and small sized airports, recorded a similar experience with increases in costs significantly outstripping increases in throughputs.

A number of other responding airports have experienced rising security expenditure in spite of either flat or reducing passenger throughputs. For example, Zurich's security expenditure rose by 34% between 2001 and 2002, despite of a drop in passenger traffic of 15% following the collapse of Swissair.

The following figure provides a comparison of the evolution of security related expenditure versus traffic growth or decline. An estimation of the net variation between security related expenditure charges and related traffic gain or reduction has also been included.



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Figure 4-17: Airport incremental security related expenditure vs. traffic growth (2000 to 2002)

Airport	Size	Expenditure Variation		Traffic Growth		Net Variation (*)	
		2000-2001	2001-2002	2000-2001	2001-2002	2000-2001	2001-2002
Schiphol	L	40.4%	146.8%	-0.2%	3.0%	40.6%	143.8%
Co. Kerry	S	7.2%	147.4%	3.4%	7.7%	3.7%	139.7%
Newcastle	M	10.8%	75.7%	0.0%	0.3%	10.8%	75.4%
Malmo	M	0.0%	50.0%	1.3%	-6.0%	-1.3%	56.0%
ADP (1)	G	45.6%	55.0%	-3.6%	0.7%	49.1%	54.3%
Zurich	L	11.1%	33.8%	-7.3%	-14.6%	18.4%	48.4%
Athens	L	0.0%	56.3%	0.0%	14.9%	0.0%	41.4%
Turin	M	85.0%	37.1%	0.2%	-1.2%	84.7%	38.3%
Avinor (2)	G	24.7%	29.9%	-4.0%	-4.2%	28.7%	34.1%
Lisbon	L	3.3%	28.6%	-0.5%	0.1%	3.8%	28.4%
Aer Rianta (3)	G	0.0%	31.4%	3.2%	4.3%	-3.2%	27.1%
Southampton	S	8.9%	17.5%	0.3%	-7.8%	8.6%	25.3%
Aberdeen	M	3.1%	24.3%	3.1%	0.5%	0.0%	23.9%
Arlanda	L	0.0%	0.0%	8.5%	-17.4%	-8.5%	17.4%
Florence	M	0.0%	8.1%	0.0%	-7.0%	0.0%	15.1%
Rotterdam	S	0.0%	0.0%	6.4%	-14.6%	-6.4%	14.6%
Copenhagen	L	1.6%	14.4%	-1.6%	0.7%	3.2%	13.7%
Helsinki	L	4.1%	9.4%	0.1%	-3.7%	4.0%	13.1%
Frankfurt	L	2.4%	11.1%	-1.6%	-0.2%	4.0%	11.4%
Stansted	L	25.1%	26.9%	15.0%	17.5%	10.1%	9.4%
Glasgow	L	8.3%	16.3%	4.8%	7.0%	3.5%	9.3%
Brussels	L	9.0%	2.4%	-5.9%	-5.1%	14.8%	7.5%
Gatwick	L	11.0%	9.0%	5.2%	2.8%	5.8%	6.2%
Edinburg	L	1.2%	18.9%	9.9%	14.2%	-8.8%	4.7%
Porto	M	64.1%	-0.9%	-5.8%	-5.0%	69.8%	4.1%
Blackpool	S	-2.1%	-1.1%	7.1%	2.0%	-9.2%	-3.1%
Heathrow	L	9.1%	0.3%	-5.9%	4.2%	15.0%	-3.9%
Eindhoven	S	11.0%	10.5%	-16.4%	29.9%	27.4%	-19.4%

Key: (\*) Expenditure variation rate less traffic growth rate. (1) Aéroports de Paris comprises both CDG and Orly airports. (2) Aer Rianta comprises Dublin, Shannon and Cork airports. (3) Comprises Avinor security expenditure but primarily Oslo-Gardermoen Airport

Source: Airport security questionnaires

The majority of responding airports have reported significant increases in security expenditure for both 2000 to 2001 and 2001 to 2002, even after traffic growth/decline has been taken into consideration (i.e. the net variation).

A few airports recorded lower security increases than traffic growth during a particular period (Edinburgh in 2000 to 2001 and Heathrow and Eindhoven in 2001 to 2002); but no airport has reported this trend for the two years taken together.

Even those airports where existing security requirements exceeded those in the rest of Europe have recorded increases in security related expenditure greater than the rate of traffic growth in 2001 and 2002. For example, UK airports that have been complying with 100% hold baggage screening requirements for a number of years have recorded security expenditure variation rates well above the rate of traffic growth. This incremental security expenditure is mainly driven by increases in labour

costs as a result of hiring additional security staff (e.g. BAA which owns and operates 7 UK airports recruited an additional 1,000 security staff during FY2002/03).

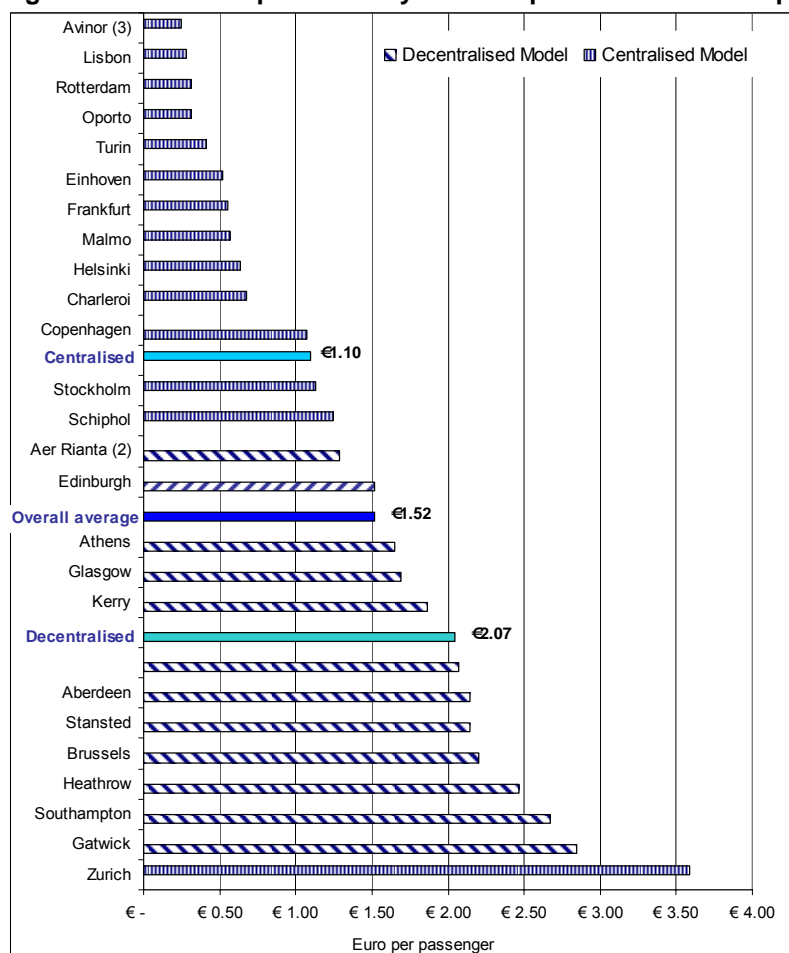
Similarly, the new Athens International Airport, which undertook hold baggage screening (i.e. fully automated screening within the baggage systems) on opening in March 2001, also experienced a significant increase in security expenditure in 2002.

#### 4.4.7 Total airport security related operational unit cost

As noted earlier, the labour related costs, whether by an airport's own staff or outsourced, represents the largest expenditure source (almost 59% for responding airports). Airport security related labour requirements are mainly driven by whether or not the airport is responsible for providing passenger and baggage screening activities. The provision of these key activities has a significant impact on the expenditure per unit of traffic (i.e. passenger and/or airfreight).

The following figures illustrate the total (i.e. not the year on year increase) security related operational expenditure per passenger in 2002 for a sample of responding airports.

**Figure 4-18: Total airport security related operational unit cost per passenger (2002)**



Key: (1) Aéroports de Paris comprises both CDG and Orly airports; (2) Aer Rianta comprises Dublin, Shannon and Cork airports; (3) Comprises Avinor security expenditure but primarily Olso-Gardermøst Airport  
Source: Airport security questionnaires

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During 2002, the total airport security related operational unit costs per passenger were as follows:

- **Decentralised model** (where the airport is responsible for the screening of passengers and bags) was **€2.07** per passenger.
- For the **Centralised model** (where the State is responsible for screening passengers and bags) this cost figure was **€1.10** per passenger.
- The **combined** weighted average for all airports was **€1.52** per passenger.

Those airports providing passenger and baggage screening activities as part of their core responsibilities have much larger security related unit costs than those airports where the responsibility for the provision of such activities rests with the State.

For airports where passenger and baggage screening provision is the responsibility of the State (e.g. Civil Aviation Administration, Police Services or another government authority) the unit cost is significantly lower ranging from €0.25 per passenger in Oslo and other airports owned by Avinor to €1.24 at Amsterdam-Schiphol airport. The weighted average for the sample of airports under the centralised model where screening activities are provided by the State was €1.10 per passenger in 2002.

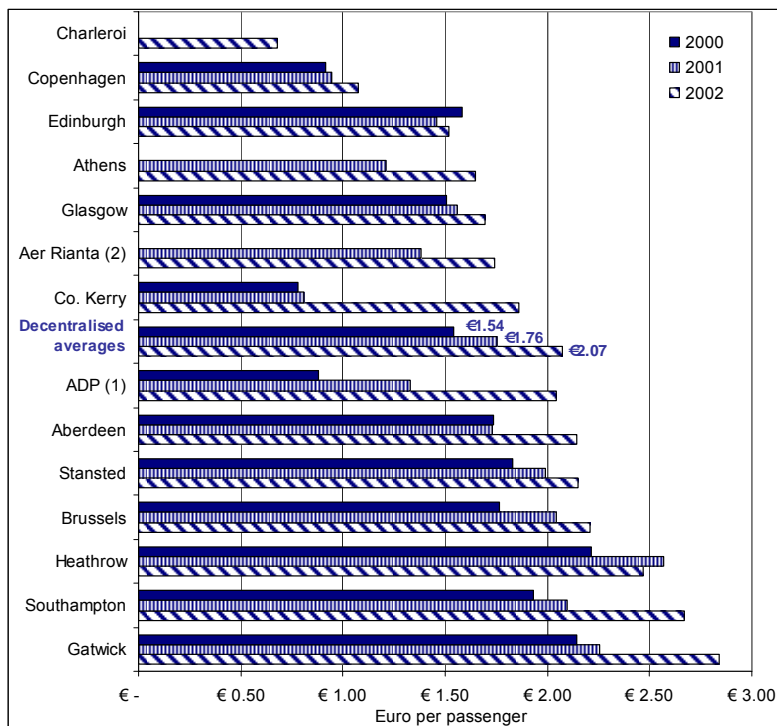
For airports responsible for providing passenger and baggage screening, security related unit costs range between €1.08 and €3.59 per passenger at Copenhagen and Zurich airports respectively in 2002. The weighted average for the sample of airports under the decentralised model providing screening activities was €2.07 per passenger in 2002.

Although passenger and airfreight throughputs are likely to have an impact on the level of security expenditure at an airport, by analysing the unit costs of responding airports, no evidence could be found, from the airport responses, that traffic throughput is a major driver of security related unit operating expenditure.

For airports that provide passenger and baggage screening, the average unit costs for small and medium sized airports such as Kerry, Aberdeen and Southampton, are in line with the rest of the sample.

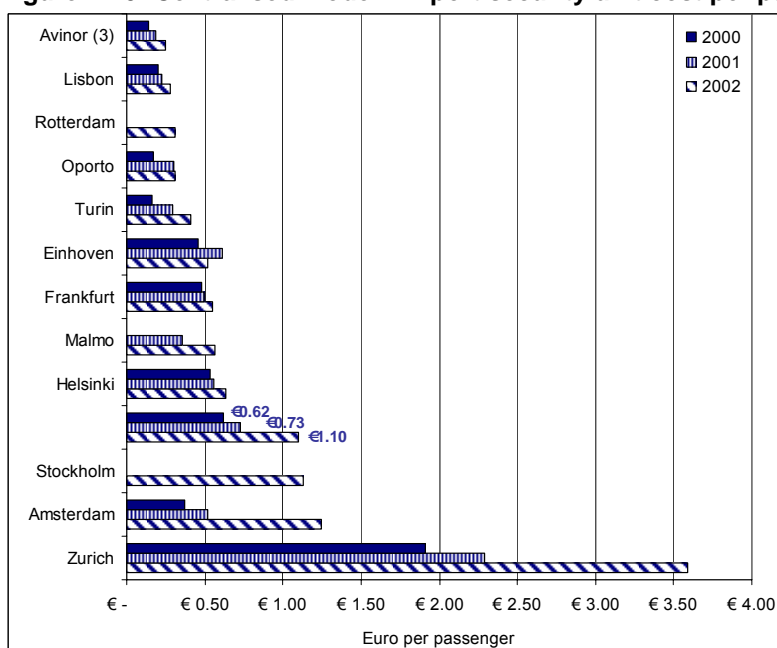
Airport security costs per traffic unit have risen significantly since 11 September 2001. The following two figures illustrate the increase in unit costs between 2000 and 2002 for a sample of airports where the provision of passenger and screening activities is provided by the airport (decentralised) as well as those where it is undertaken by another party, normally the State (centralised).

**Figure 4-19: Decentralised model: Airport security unit cost per passenger (2000 to 2002)**



Source: Airport security questionnaires

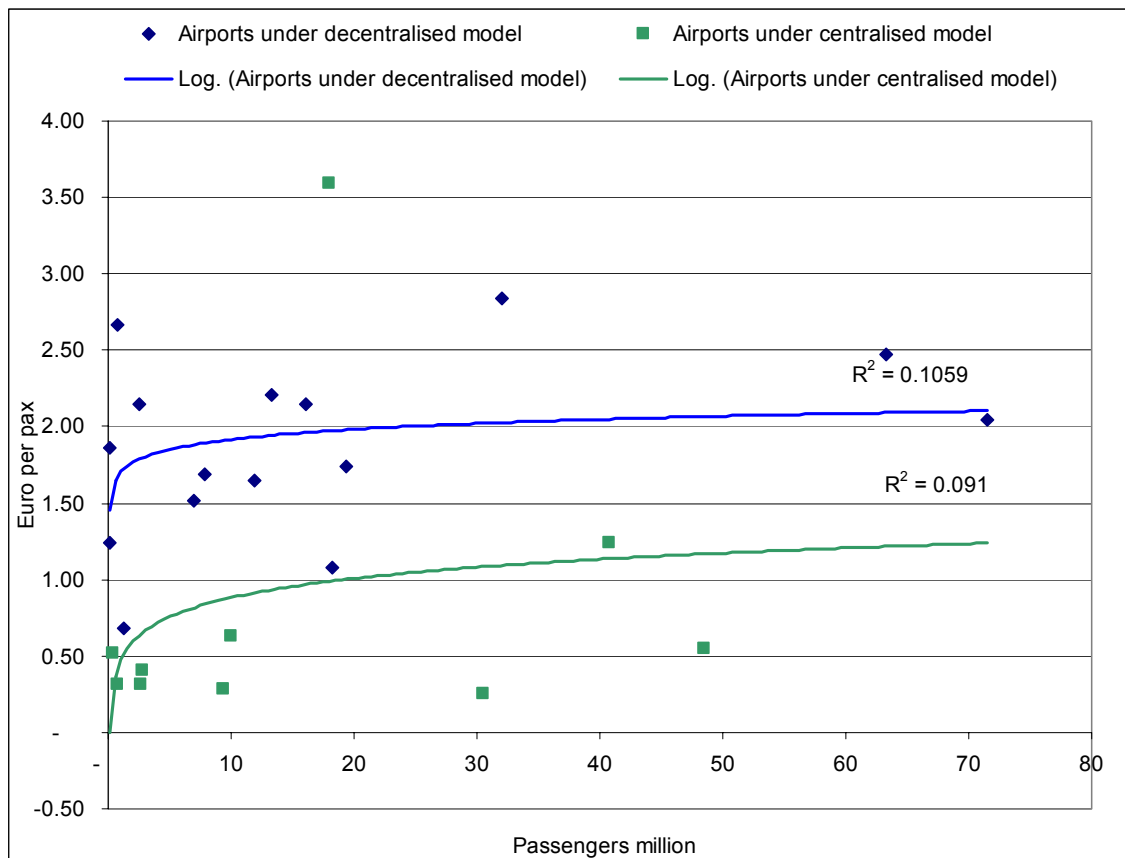
**Figure 4-20: Centralised model: Airport security unit cost per passenger (2000 to 2002)**



Source: Airport security questionnaires

Key: (1) Aéroports de Paris comprises both CDG and Orly airports; (2) Aer Rianta comprises Dublin, Shannon and Cork airports; (3) Comprises Avinor security expenditure but primarily Oslo-Gardermoen Airport

**Figure 4-21: Airport total security operational cost versus traffic throughput (2002)**



Source: Airport security questionnaires

Although the difference in unit costs between airports responsible for screening activities and where the State is responsible is clear, when the trend line is applied, no meaningful correlation (as measured by the  $R^2$  value from a total of 1) between security related unit cost and throughput (passengers) was found.

The larger airports have more passengers to spread the costs of security and should be able to generate efficiencies in scope and scale as compared with the small to medium airports. However, operational complexities may be one of the key reasons why the security related operational costs per passenger for the large airports are broadly comparable with unit costs at the medium and small airports in the sample.

#### 4.4.8 Airport expenditure conclusions

In this section an estimation of the total operating security related expenditure for European airports is provided.

There is a substantial difference in average operating unit costs between those airports responsible for passenger and baggage screening activities themselves (decentralised model) and those where such activities are the responsibility of the State (centralised model).

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In each of the 18 States it was identified whether the airport or the State authority have primary responsibility for the provision of passenger and baggage screening. A number of assumptions were made in those States where responsibilities are split. For example, in Belgium and Greece, screening is undertaken by the airport company at the main airport (i.e. Brussels and Athens) while regional governments and the Civil Aviation Authority provide screening at regional airports respectively. Although screening responsibilities in the Netherlands were handed over to airports in April 2003, for the purpose of this estimation, the working premise is that screening was under State control in 2002.

The figure below shows the classification of each State under the two models as well as the level of passenger throughputs handled by each State's airports in 2002.

**Figure 4-22: Distribution of screening responsibilities and passenger throughputs (2002)**

THROUGHPUTS 2001 vs 2002 (million passengers)					
State	Centralised Model		State	Decentralised Model	
	2002	2001		2002	2001
1 Austria	16	15	1 Belgium (1)	16	21
2 Finland	13	14	2 Denmark	21	21
3 Germany (2)	94	93	3 France	121	121
4 Iceland	2	2	4 Greece (3)	12	10
5 Italy	88	86	5 Ireland	20	19
6 Luxembourg	2	2	6 United Kingdom	191	184
7 Netherlands (4)	42	40			
8 Norway	31	32			
9 Portugal	20	21			
10 Spain	143	144			
11 Sweden	28	32			
12 Switzerland	29	32			
<b>Centralised</b>	<b>506</b>	<b>515</b>	<b>Decentralised</b>	<b>381</b>	<b>376</b>
<b>Total (18 States)</b>	<b>887</b>	<b>890</b>			

Key: (1) Assumed airport as Brussels International Airport accounts for 83% of Belgium's passenger throughputs; (2) Passenger throughputs excludes transfer and transit passengers as advised by BMI; (3) Only reflect passenger throughputs at Athens; (4) State responsible for screening before April 2003.

Estimation: AviaSolutions

European airports undertaking screening activities account for 43% of European passenger throughputs. The remaining 57% includes airports where screening activities are provided by the State. Note that when the Netherlands is added to the decentralised total (from April 2003); throughputs change to 48% and 52% respectively.

It is estimated that the total security related operational expenditure for the airports in the 18 States was in the region of €1.32n in 2002. This represents a weighted average security cost of €1.52 per passenger across all of the States.

This compares to a total security related operational expenditure for European airports of €1.03bn in 2001. This represents a weighted average security cost of €1.16. The main areas of cost increase include:

- Outsourcing.
- Labour costs.
- Insurance.

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**Figure 4-23: Airport screening responsibilities, passenger and estimated throughputs and estimated expenditure (2001 and 2002)**

Screening provision model	Passengers (million)	% total	Weighted Average security cost (€ per pax)	Estimation of security expenditure (€ million)	% total
<b>2001</b>					
Centralised (State provision)	515	58%	€ 0.73	€ 374	36%
Decentralised (Airport provision)	376	42%	€ 1.76	€ 660	64%
<b>Total (18 States)</b>	<b>890</b>	<b>100%</b>	<b>€1.16</b>	<b>€1,034</b>	<b>100%</b>
<b>2002</b>					
Centralised (State provision)	506	57%	€ 1.10	€ 534	29%
Decentralised (Airport provision)	381	43%	€ 2.07	€ 788	71%
<b>Total (18 States)</b>	<b>887</b>	<b>100%</b>	<b>€1.52</b>	<b>€1,322</b>	<b>100%</b>

Estimation: IAA/AviaSolutions

#### 4.4.9 Airport security capital investment

Capital expenditure investment in security related activities has risen sharply over the last 3 years. From the 36 financial responses received from airports, 19 included detailed information on security related capital expenditure. The findings outlined in this section are based on the inputs provided by the airports.

New security standards arising in the aftermath of 11 September 2001 as well as the mandated requirements and timescales in Regulation (EC) No 2320/2002, particularly those related to screening of hold baggage, have required some airports to significantly increase investment in security related equipment and facilities.

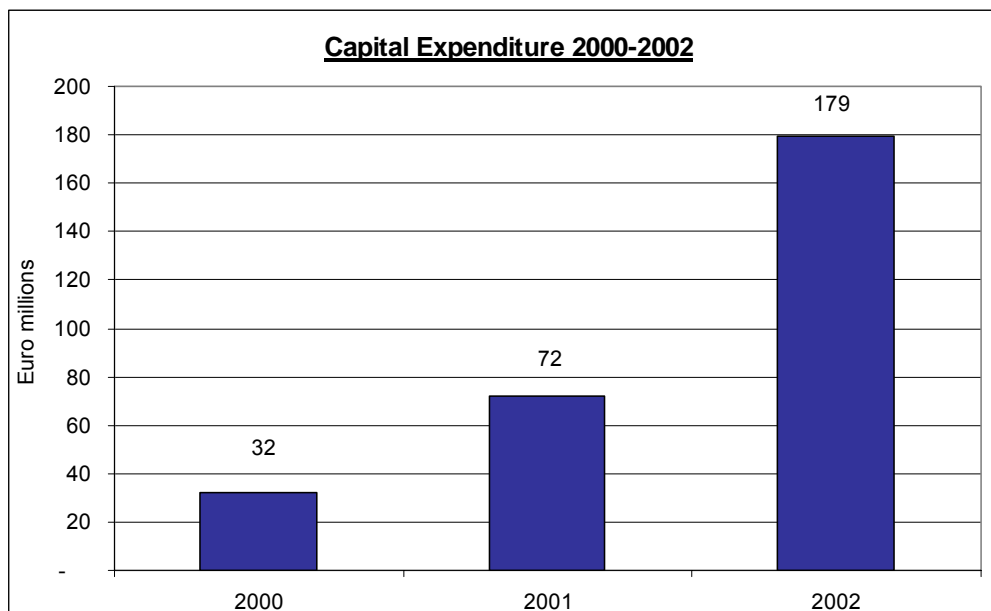
The airport security questionnaire requested details of the impact of new security requirements on each airport's capital expenditure plans during the last 2 years. Airports were requested to break their capital expenditure into 3 areas:

- **Equipment:** expenditure related to the acquisition and installation of new security equipment including hold baggage screening devices, explosive detection systems (EDS), x-ray machines, CCTV equipment, biometric readers, etc.
- **Terminal redevelopment:** expenditure on the modification or expansion of terminal facilities necessary to accommodate new security procedures and equipment e.g. baggage make-up areas, check-in halls, etc.
- **Others:** any other security related investment that cannot be categorised under the other 2 groups. For example, some airports have tightened access to restricted areas; others have strengthened perimeter fences, etc.

##### 4.4.9.1 Airport total investments

Capital expenditure on security related items has risen sharply since 2000. For the 19 airports providing financial information on security related capital expenditure, investment doubled between 2000 and 2001 from €32m to €72m. In 2002, this increased almost 2.5 times on the 2001 level to €179m.

**Figure 4-24: Security related capital expenditure (2000 to 2002)**



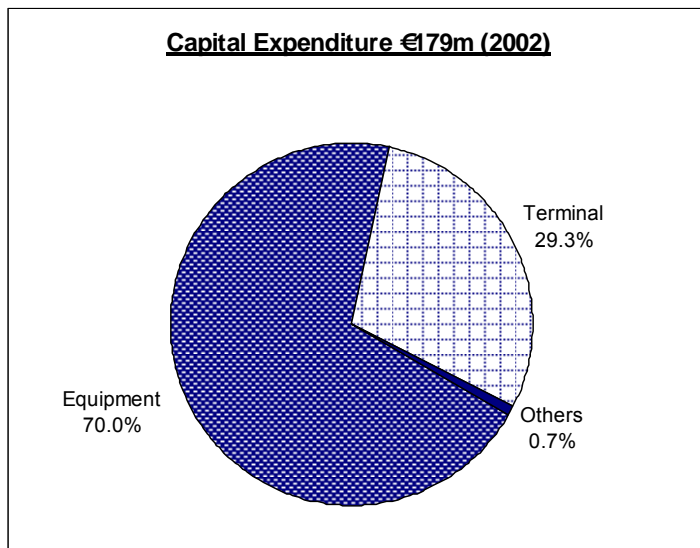
Source: Airport security questionnaires

#### **4.4.9.2 Airport expenditure breakdown**

In terms of what was purchased, the acquisition of equipment represented the largest source accounting for 70% of total capital expenditure during 2002. Security related terminal redevelopment expenditure accounted for 29% while other investments consumed the remaining 1%.



**Figure 4-25: Capital expenditure breakdown for a sample of European Airports (2002)**

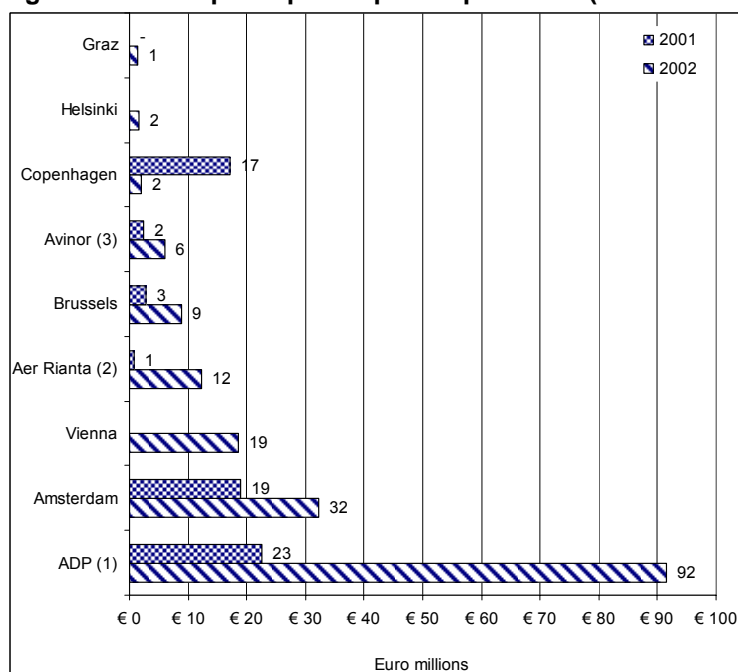


Source: Airport security questionnaires

#### 4.4.9.3 Airport security investments

A number of responding airports have made large investments in security related items during the last 3 years. The following figure shows the capital expenditure for the responding airports in 2001.

**Figure 4-26: Sample airport capital expenditure (2000 to 2002)**



Key: (1) Aéroports de Paris comprises both CDG and Orly airports; (2) Aer Rianta comprises Dublin, Shannon and Cork airports; (3) Comprises Avinor security expenditure but primarily Oslo-Gardermoen Airport

Source: Airport security questionnaires

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Aéroports de Paris (ADP), the operator of CDG and Orly airports, invested almost €92m in 2002, almost 4 times as much as in 2001 and 10 times more than in 2000. Over 60% of ADP's security expenditure was for the acquisition of equipment and a further 37% on terminal redevelopments at CDG (Aerogare 1) and Orly (Aerogares Oëst and Sud).

ADP is followed by Amsterdam-Schiphol Airport which invested €19m and €32m in 2001 and 2002 respectively. The largest proportion of investment related to terminal redevelopment works associated with the introduction of centralised security control checkpoints (passenger screening had previously been undertaken at the departure gates). Other substantial investments include the acquisition of biometric devices for staff screening and border control activities, etc.

Vienna Airport invested almost €18m in x-ray and EDS equipment during 2002.

Aer Rianta, the operator of Dublin, Shannon and Cork airports, had a total security related capital expenditure of €12m in 2002 most of which was associated with screening equipment.

Although Copenhagen airport's security related investments totalled around €2m in 2002, it advised that it had previously spent circa €17m in both 2000 and 2001.

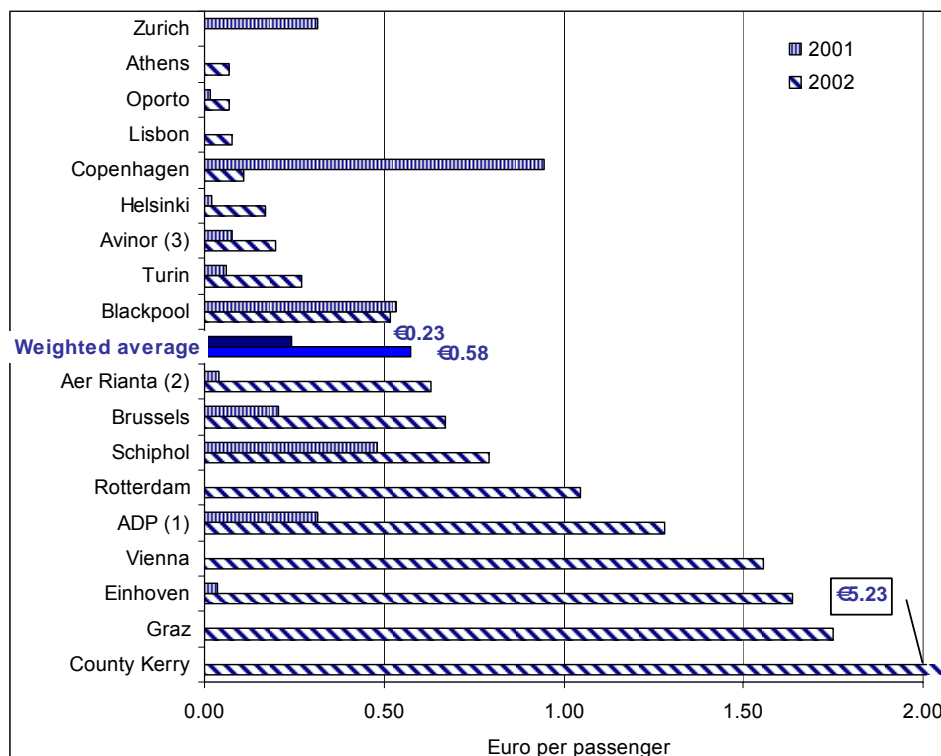
The level of capital investment on security related items in the UK over the 3 year period was much lower than in other States. This was due to the introduction of 100% passenger and hold baggage screening from the mid 1990s onwards.

#### 4.4.9.4 Airport capital investment per unit of throughput

It is difficult to compare capital expenditure versus traffic throughput over such a short timeframe. It is also difficult to compare investment levels between airports. Airports in the UK for example had significant capital investment in the mid to late 1990s to meet the Department for Transport's requirements for the introduction of 100% hold baggage screening. The recent UK capital investment levels have therefore been less than in some other States.

The capital expenditure per passenger has been estimated for the responding airports. The following figure illustrates the security investment per passenger for 2001 and 2002.

**Figure 4-27: Capital expenditure per passenger (2001 vs. 2002)**



Source: Airport security questionnaires

Key: (1) Aéroports de Paris comprises both CDG and Orly airports; (2) Aer Rianta comprises Dublin, Shannon and Cork airports; (3) Comprises Avinor security expenditure but primarily Oslo-Gardermoen Airport.

Security related capital expenditure per passenger varied widely for the responding airports during 2001 and 2002. In 2001, for those airports where information was provided, investment per passenger ranged from €0.06 for Turin to €0.95 for Copenhagen airports. The average security related capital expenditure was €0.23 per passenger in 2001 for the responding airports.

By 2002, security related investment on a per passenger basis had risen sharply for most airports. It ranged from a minimum of €0.07 at Athens up to a maximum of €5.23 at Kerry airport. The average security investment per passenger had more doubled from €0.23 to €0.58 in 2002 over 2001.

The top 3 airports in the 2002 unit capital expenditure ranking are small sized airports (i.e. Kerry, Graz and Eindhoven). This reinforces the previous view that security investment requirements are proportionally larger at small and medium sized airports compared to larger European airports. Meeting the new European security regulation, particularly in terms of passenger and baggage screening standards, represents a large financial burden for small and medium sized airports and is likely to have a significant impact on their unit costs and overall business performance.

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## 4.5 Carrier security expenditure

### 4.5.1 Introduction

This section provides an overview of the financial impact that increased security measures and associated costs have had on European carriers since 11 September 2001.

An estimation of the incremental cost per passenger for a sample of different types of carrier (i.e. full network carriers, regional carriers, charter carriers and low cost / low fare carriers) is included.

### 4.5.2 Carrier security expenditure inputs

The key purpose from the carrier security questionnaire was to get a view on the estimated financial impact of additional security measures introduced after 11 September 2001. A total of 41 European carriers were surveyed as part of the stakeholder consultation process with 28 responses received. These carriers represent around 55% of carriers' total throughput for the 18 States in 2002 (based on 110 passenger carriers in the 18 States).

**Figure 4-28: Carrier responses**

<b>Carrier type</b>	<b>Contacted (number)</b>	<b>Respondents (number)</b>	<b>Throughput in 2002 of respondents (m pax)</b>	<b>Responses as proportion of total segment traffic (% of segment)</b>
Network/hub operator	20	15	219	73%
Regional	14	9	15	24%
Charter	5	3	21	24%
No frills	2	1	11	38%
<b>Total</b>	<b>41</b>	<b>28</b>	<b>266</b>	<b>55%</b>

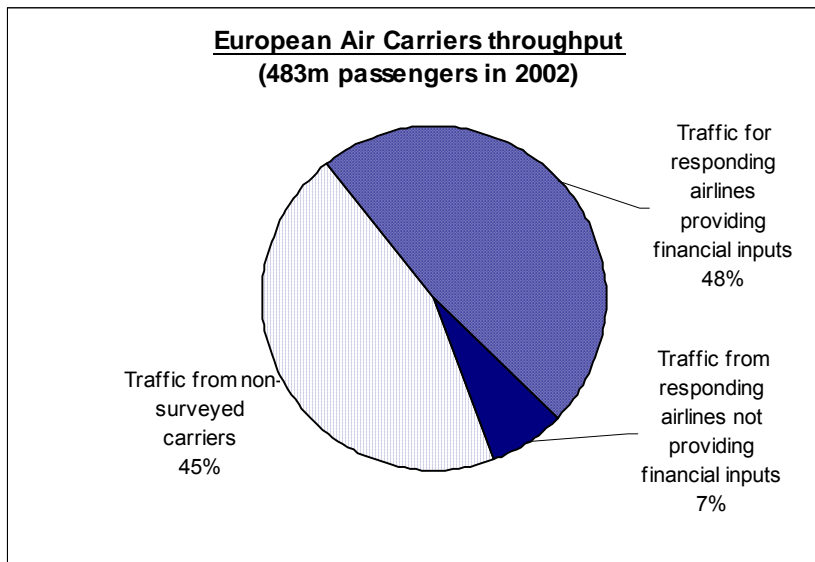
Source: Carrier security questionnaires  
Estimations: IAA / AviaSolutions

From the responses received, 19 carriers provided detailed financial information on security related expenditure for the period 2000 to 2002. The findings outlined in this section are based on the inputs provided by these carriers. The respondents include a range of carrier types and their responses help to understand the recent trends in security related expenditure for carriers.

It should be noted that many of the carriers provided incremental cost information, i.e. increased costs on the previous year's level. As such this section treats the carrier costs on an incremental rather than total cost basis.

Security related financial information was received from the following types of carriers in the figure below.

**Figure 4-29: Responses from surveyed European carriers (2002)**



Source: Airport security questionnaires, AEA, ERA, Airline Business and Air Transport Intelligence

**Figure 4-30: Carriers providing financial data**

Carrier type	Respondents (number)	Carriers providing financial data (number)	Throughput in 2002 of carriers providing financial data (m pax)	Responses as proportion of total segment traffic (% of segment)
Network/hub operator	15	11	196	65%
Regional	9	5	11	17%
Charter	3	2	13	15%
No frills	1	1	11	38%
<b>Total</b>	<b>28</b>	<b>19</b>	<b>231</b>	<b>48%</b>

Source: Carrier security questionnaires  
Estimations: IAA/AviaSolutions

The 19 carriers providing financial data accounted for around 231m passengers in 2002 representing 48% of carrier throughputs for the 18 States.

The responses from network or hub carriers (members of AEA), which as a group have recorded the largest financial impact after 11 September 2001, represent 65% of the total traffic for this segment. Air France was the only large European network carrier that did not provide any information. Alitalia and Iberia submitted responses to the carrier security questionnaire but did not provide details of security related expenditure.

The carrier questionnaire requested information on security related expenditure. The following group of direct and indirect cost categories was included.

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**Figure 4-31: Direct versus indirect carrier cost categories**

Direct costs	Indirect costs
1. Insurance	1. Staff background checks
2. Additional staff	2. Terrorism training
3. Security training	3. Information Technology (IT)
4. Reinforced cockpit doors	4. Support services:
5. Additional surveillance	4.1. Ground handling
6. Others	4.2. Catering
	4.3. Aircraft cleaning
	5. Others

Source: Carrier security questionnaire

Respondents were requested to include only the financial information related to security activities. For example, additional staff should reflect the cost associated with extra security staff only; while support services should reflect security related expenditure on ground handling, catering, aircraft cleaning, etc.

Not all respondents provided the same level of detailed costs in their submissions. Some carriers provided incremental costs on some of the expenditure categories (e.g. British Airways, KLM and Lufthansa). Others, particularly the regional carriers, mainly provided details on increased insurance charges. The following figure summarises the cost categories for which information was provided by each of the respondents.

**Figure 4-32: Carriers providing financial inputs – cost category breakdown**

Carrier	Carrier type	Insurance	Additional staff	Security training	Reinforced cockpit doors	Additional surveillance	Others direct	Staff background checks	Terrorism training	Information technology	Support services	Others indirect
OS Austrian Airlines	F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SK SAS Scandinavian	F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
AY Finnair	F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
KF Air Botnia	R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
LH Lufthansa	F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
EW Eurowings	R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
AB Air Berlin <sup>(1)</sup>	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
EI Aer Lingus	F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
KL KLM	F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP TAP Air Portugal	F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NI PGA Portugalia	R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
JK Spanair	F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
YW Air Nostrum	R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
JZ Skyways	R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
LX Swiss Air Lines	F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BA British Airways	F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BD bmi	F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DP Air 2000	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
U2 easyJet	L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		15	7	7	11	8	5	3	4	7	7	3

Key: (F) Full network; (R) Regional; (C) Charter and (L) Low-cost

Note: (1) Air Berlin has migrated into the low-cost sector from mid 2002 onwards

Source: Carrier security questionnaires

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From the above figure, insurance and reinforced cockpit doors are the 2 main areas of incremental expenditure information provided by respondents. Detailed costs were provided for these items by 15 and 11 carriers respectively. Other cost categories where information was provided include additional security staff, security and terrorism training, surveillance and information technology.

Segregating the cost information proved difficult (some carriers provided incremental security costs rather than total costs for expenditure categories e.g. insurance, staff). In order to ensure comparability amongst carriers, it has been necessary to address the issue of financial impact on an annual incremental cost basis rather than to compare total annual costs.

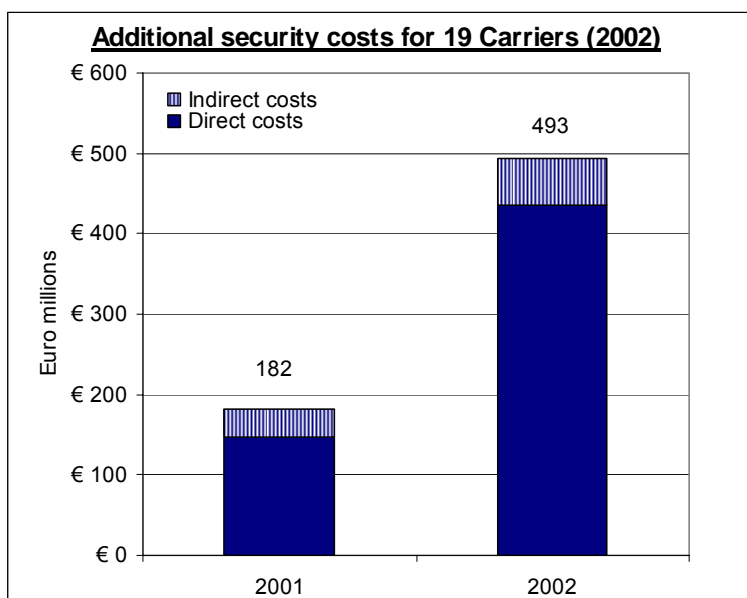
### 4.5.3 Total incremental expenditure

For the 19 carriers providing financial inputs, incremental security expenditure totalled €182m in 2001 over 2000. These incremental costs were occurred in the last quarter of 2001 as a direct result of the terrorist attacks in the US on 11 September 2001.

However, the full financial impact of increased security requirements is more evident during 2002, when the same number of carriers recorded further incremental security costs of €493m in 2002 over 2001. This was an increase of 2.7 times over the previous year, as the impact in 2001 had been incurred mainly in the last quarter.

After 11 September 2001 and up to end of 2002, the sample of carriers reported combined increased costs of around €675m due to increased security requirements.

**Figure 4-33: Carrier Incremental expenditure (2001 and 2002)**

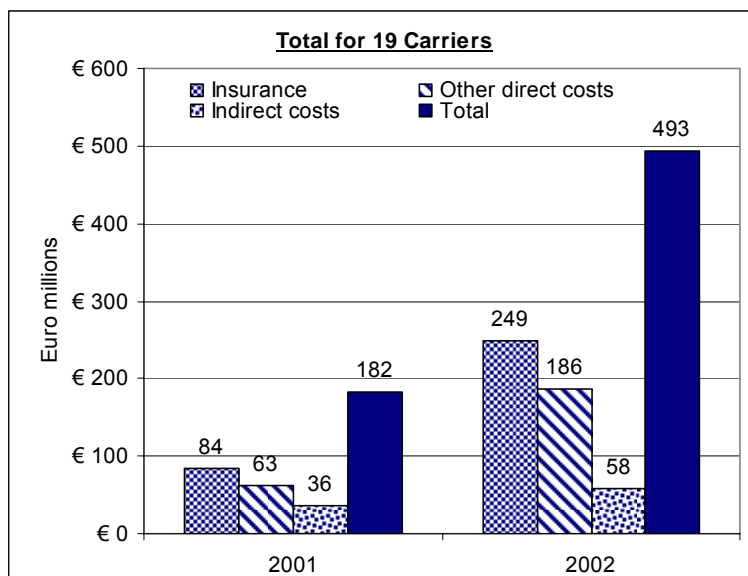


Source: Carrier security questionnaires

Direct costs, which include increases in insurance premiums, accounted for 81% and 88% of incremental expenditure in 2001 and 2002 respectively. Insurance costs accounted for 46% and 50% of increased costs during the same period. Incremental insurance premiums represent the largest increase in the aftermath of the 11 September 2001 attacks.

The following figure shows the breakdown of incremental security costs, including insurance, for 2001 and 2002.

**Figure 4-34: Carrier incremental expenditure including insurance (2001 and 2002)**

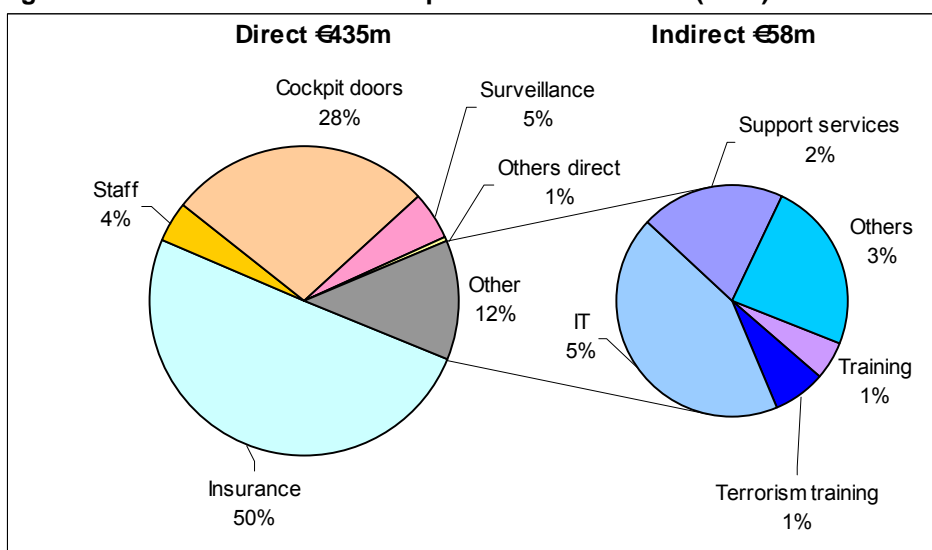


Source: Carrier security questionnaires

#### 4.5.4 Carrier additional expenditure breakdown

In terms of expenditure breakdown, increased costs of insurance premiums are the single largest item, accounting for 50% of the total in 2002. This is followed by reinforced cockpit doors which account for 28%. Other important direct expenditure categories included incremental security staff and surveillance expenditure. Together they represent 9% of the total incremental expenditure.

**Figure 4-35: Carrier incremental expenditure breakdown (2002)**



Source: Carrier security questionnaires

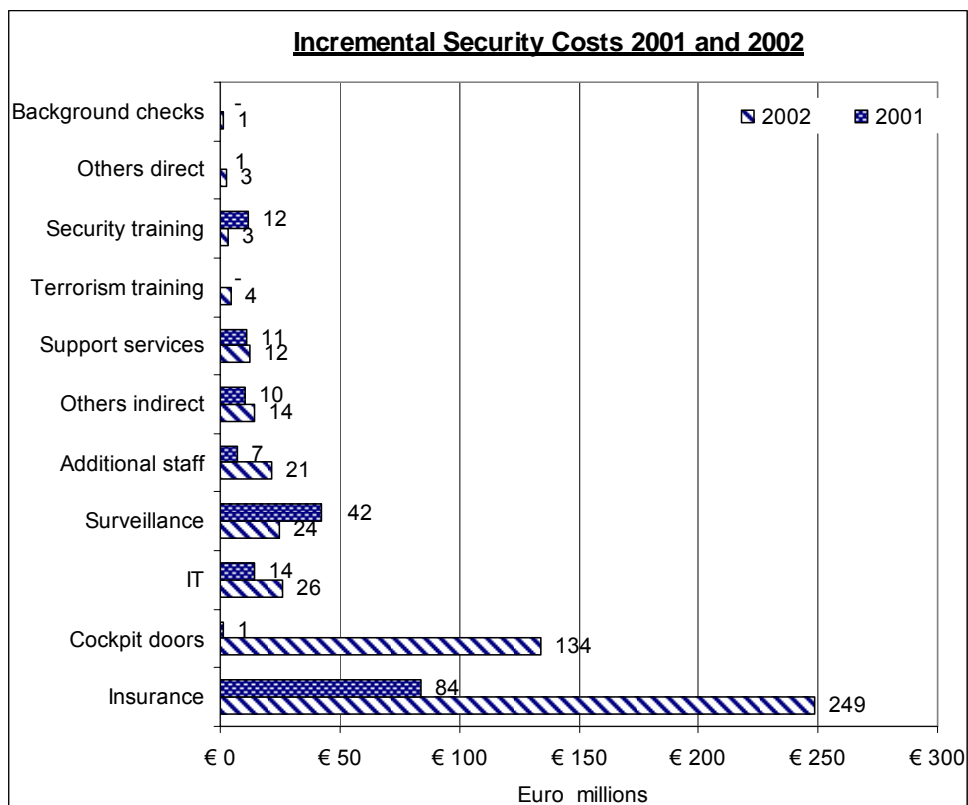


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Within indirect costs, the top 2 areas of expenditure were IT and support services (ground handling, catering and aircraft cleaning), accounting for 5% and 2% of the total respectively.

The rates of increase of different security related expenditure items varied between 2001 and 2002. The following figure illustrates the incremental expenditure for each category for 2001 and 2002 over 2000 and 2001 respectively.

**Figure 4-36: Carrier incremental expenditure breakdown (2001 and 2002)**



Source: Carrier security questionnaires

The impact of each of the above expenditure categories for the sample of 19 responding carriers is discussed below.

#### 4.5.4.1 Insurance costs

As well as being the most significant overall expense item in each of the 2 years, insurance premiums have also recorded the largest absolute increases during the last 2 years. Based on the information provided by the 19 responding carriers, between 2001 and 2002, their incremental year on year costs have almost tripled increasing from €84m to €249m.

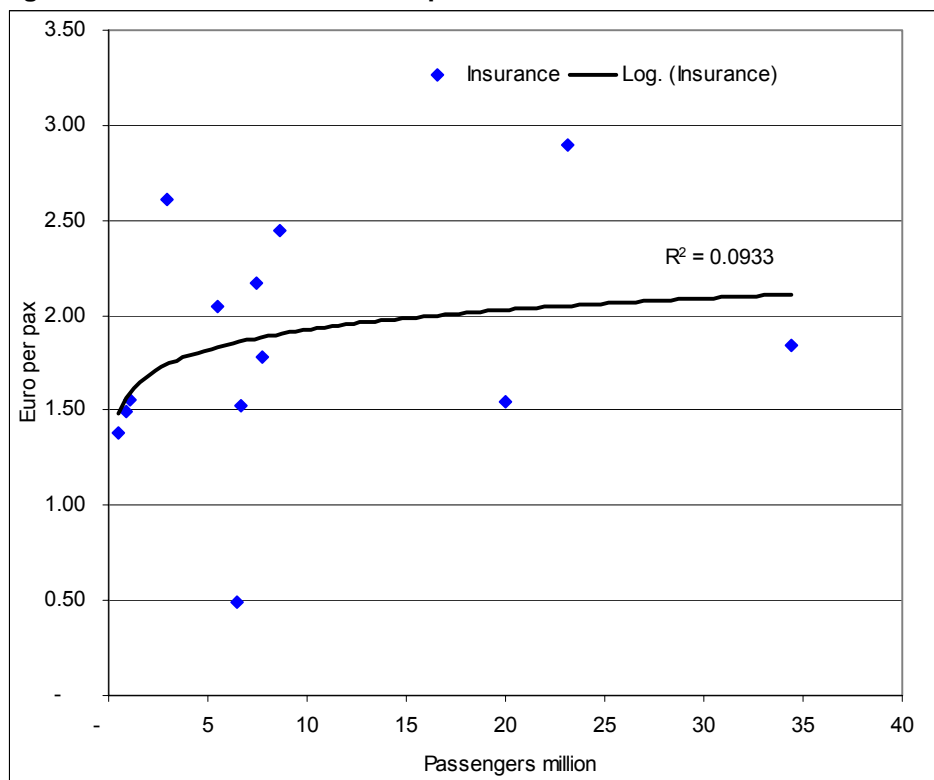
It is important to note that based on the responses, the 2002 total insurance cost was €333m (i.e. €84m + €249m) more than the 2000 level.

Average incremental insurance costs per passenger were estimated for the carriers that provided insurance costs. The average incremental insurance cost went up by €0.82 and €1.98 per passenger in 2001 and 2002 respectively (a growth of 141%).

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When the trend line is applied, no meaningful correlation (as measured by  $R^2$  value from a total of 1) between incremental insurance charges and passenger throughput was found.

**Figure 4-37: Carrier incremental expenditure breakdown 2001 vs. 2002**



Source: Carrier security questionnaires  
Estimates: IAA/AviaSolutions

#### 4.5.4.2 Reinforced cockpit doors

This represents the second largest cost area for carriers at 28% in 2002 totalling €134m for the 19 surveyed carriers. This item totalled only €1m in 2001, not surprisingly, as compliance requirements relating to cockpit doors were first introduced by the FAA and European authorities in 2002.

Some carriers expect to incur incremental costs relating to reinforced cockpit doors over the coming years as they complete the refitting of their fleet. For example, British Airways and TAP are expecting to invest an additional €14m during 2003.

It would appear from the responses that the main expenditure on reinforcing cockpit doors on existing aircraft was largely completed in 2002. The ongoing requirement to have compliant cockpit doors will be integrated into the manufacture costs of new aircraft in the future.

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#### **4.5.4.3 Information Technology (IT)**

Incremental IT costs increased from €14m to €26m between 2001 and 2002, an increase of 86%. Overall IT costs accounted for 5% of total incremental costs in 2003.

Incremental IT activities mainly relate to the collection and provision of passenger data for government authorities, particularly the TSA and border control officials in the US. These requirements include the provision of passport details in advance and access to passenger bookings (i.e. Passenger Name Records), etc. Some IT expenditure also results from new mandatory requirements such as passenger and baggage reconciliation.

#### **4.5.4.4 Surveillance**

Incremental surveillance costs were 5% of total incremental costs in 2002. Costs increased by €42m and €24m in 2001 and 2002 respectively. Extra surveillance costs are a consequence of additional security requirements such as the protection and guarding of aircraft, which is normally carried out by private security firms on behalf of the carriers.

#### **4.5.4.5 Security staff**

Increased security requirements have led to additional security staff requirements for most carriers and accounted for 4% of total incremental costs in 2002. Hiring additional staff represented extra labour costs of €7m in 2001 and a further €21m in 2002.

#### **4.5.4.6 Support services**

Ground support services, which include ground handling, in-flight catering and aircraft cleaning also increased after 11 September 2001. The incremental costs associated with these activities have increased by €11m and a further €12m during 2001 and 2002. These accounted for 2% of total incremental costs in 2002.

#### **4.5.4.7 Training: security and anti-terrorism**

Carriers have been required to improve staff training related to security and terrorism threats. The costs for these activities rose by €4m and €3m respectively for the 19 responding carriers in 2002 over 2001, circa 2% of total incremental costs. However, security training rose by €12m during 2001 over 2000 in the direct aftermath of 11 September 2001.

#### **4.5.4.8 Other costs**

Other direct and indirect costs rose by €3m and €14m respectively. These represent a growth of 200% and 40% over the previous year and account for a combined 4% of total incremental costs in 2002.

### **4.5.5 Carrier incremental cost per traffic unit**

A comparison of incremental security related cost per traffic unit provides an insight into how carriers have been financially impacted in terms of passengers carried as well as an estimate of the overall incremental cost due to additional security since 2001.

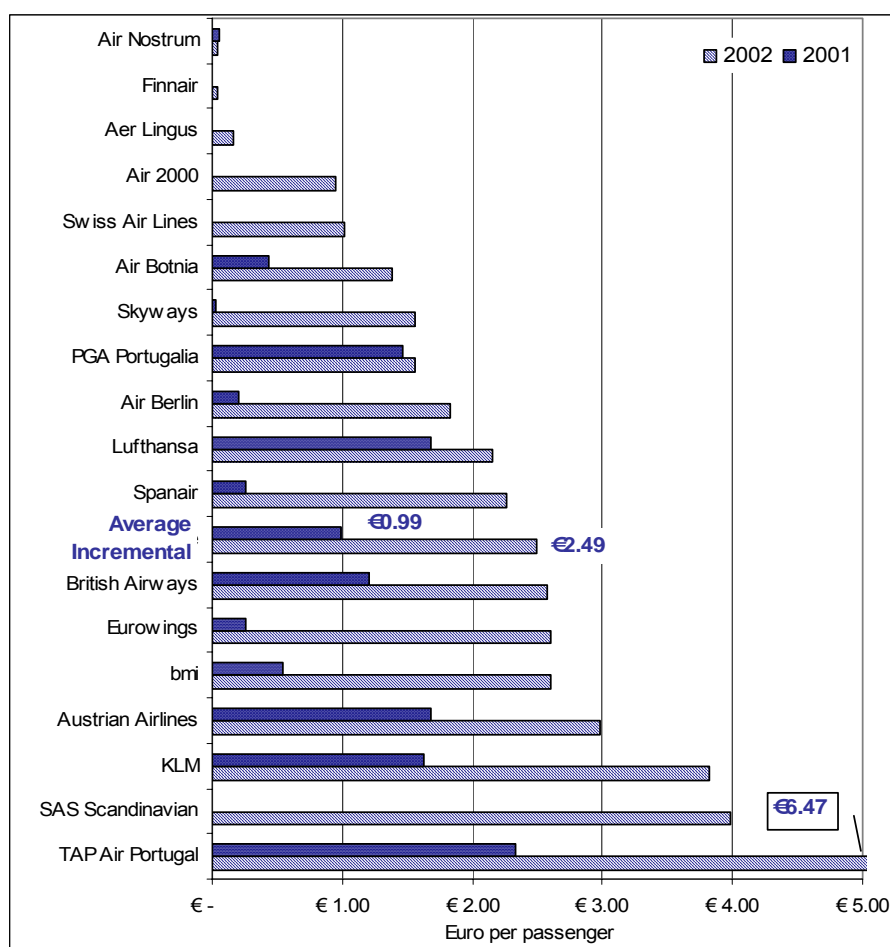
This comparative analysis is focused on unit incremental costs, both including and excluding insurance costs and capital expenditure (i.e. reinforced cockpit doors) on a per passenger basis. The analysis is based on passengers rather than a broader traffic unit such as workload unit (WLU) because most of the additional security requirements, to date, have concentrated on improving passenger security. Most

security expenditure items such as reinforced cockpit doors, surveillance, security and anti terrorism training, etc. are directed at improving security for the passenger at the airport and on board the aircraft.

#### 4.5.5.1 Carrier total incremental security related costs

The following figure illustrates the incremental cost per passenger provided by the responding carriers for 2001 and 2002.

**Figure 4-38: Carrier incremental security expenditure per passenger including insurance (2001 to 2002)**



Source: Carrier security questionnaires  
Estimations: IAA / AviaSolutions

Incremental costs vary widely amongst respondents. TAP Air Portugal recorded the largest increase in security related incremental expenditure at €6.47 per passenger in 2002 compared to €2.33 in 2001 (up 177%).

The next 3 carriers - SAS, KLM and Austrian - reported incremental security related cost per passenger of €3.98, €3.82 and €2.98 respectively in 2002 over 2001 levels.

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The weighted average incremental increases for respondents were €0.99 and €2.49 per passenger for 2001 and 2002 respectively, an increase of 152% year on year.

Large network carriers with a strong presence in the North Atlantic market (particularly to the US) such as KLM and British Airways have recorded above average increases in incremental security costs. This group of carriers is required to comply with additional security requirements enforced by the US authorities such as reinforced cockpit doors, provision of access to passenger data, etc. which translate into higher security related costs.

In general, regional and charter carriers appear to have suffered to a lesser extent. Their incremental cost units are generally below the sample weighted average.

#### **4.5.5.2 Carrier incremental security related costs excluding cockpit doors**

The previous average includes capital expenditure items such as reinforced cockpit door costs. Although some carriers expect to incur some costs over the coming years as they complete the refitting of their fleets (e.g. British Airways and TAP as mentioned earlier), it would appear that the main capital expenditure was largely completed in 2002.

When cockpit doors are excluded from the analysis, incremental security related unit costs per passenger reduced for 2002. With the exception of British Airways, all responding carriers only incurred reinforced cockpit doors related costs from 2002 onwards (British Airways financial years closes at the end of March and at the end of their FY2001/02, the carrier had included part of the reinforced cockpit doors expenditure).

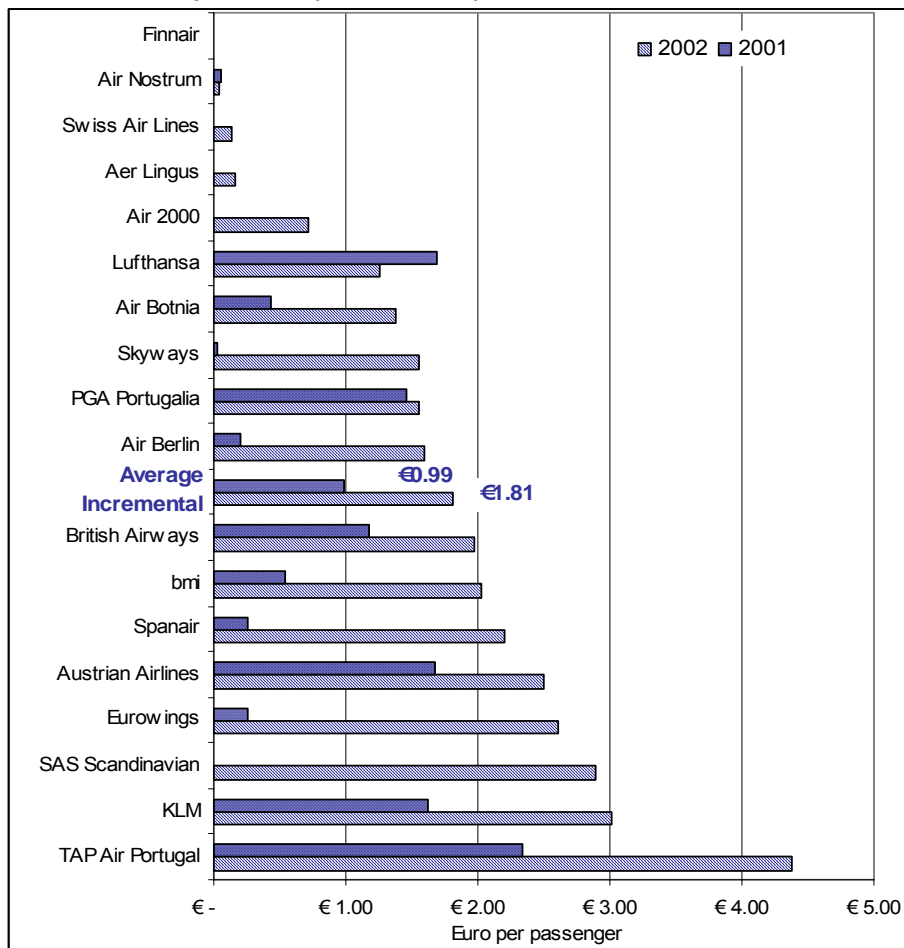
The ranking from the previous figure remains unchanged. TAP recorded the highest incremental cost unit at €4.38.

TAP is again followed by KLM, SAS and Eurowings with average incremental unit costs of €3.02, €2.90 and €2.60 respectively.

The weighted average incremental unit cost excluding capital expenditure (i.e. excluding reinforced cockpit doors) were €0.99 and €1.81 per passenger for 2001 and 2002 compared to €0.99 and €2.49 when all incremental costs were included.

By removing this “one off” capital cost, it could be argued that this represents a more appropriate view of carrier incremental security costs on an ongoing basis.

**Figure 4-39: Carrier incremental security related expenditure per passenger excluding reinforced cockpit doors (2001 to 2002)**



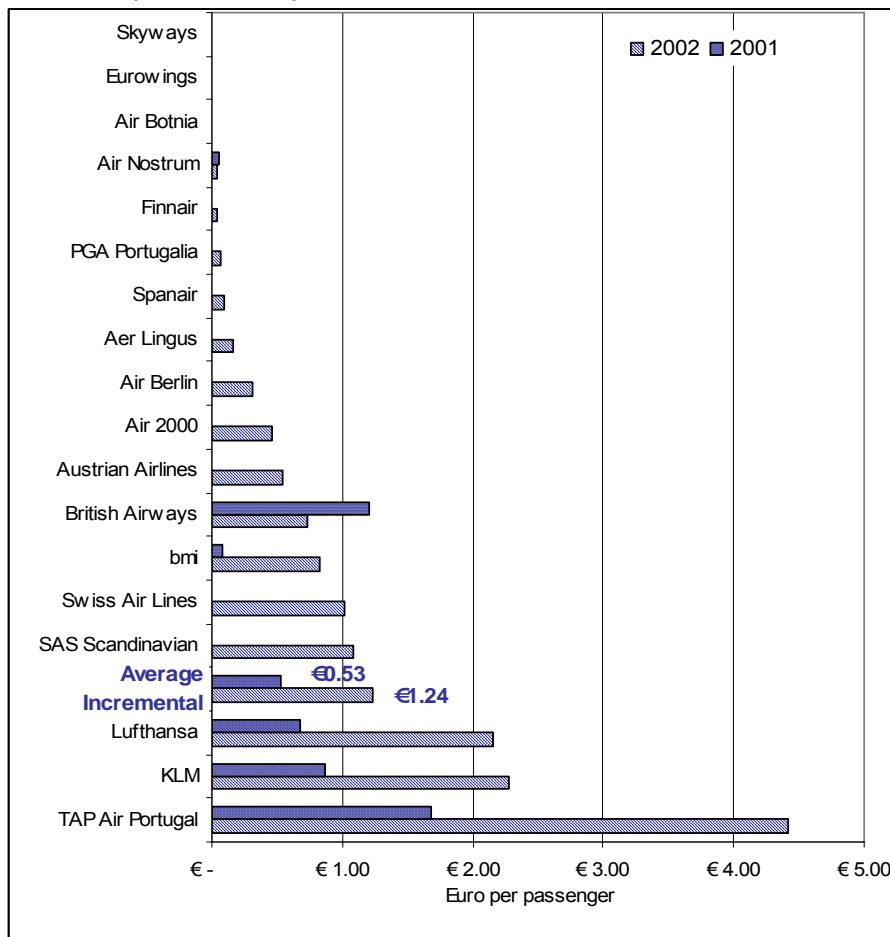
Source: Carrier security questionnaires  
Estimations: IAA/AviaSolutions

#### 4.5.5.3 Carrier incremental security related costs excluding insurance

The average incremental cost how above includes insurance charges that, as noted before, represent the largest additional security related cost category for most carriers.

When insurance costs are stripped out from the above analysis, the incremental security cost per passenger reduces significantly.

**Figure 4-40: Carrier incremental security related expenditure per passenger excluding insurance (2001 to 2002)**



Source: Carrier security questionnaires  
Estimations: IAA/AviaSolutions

The weighted average incremental cost per passenger reduces by half when insurance is excluded from €0.99 to €0.53 per passenger for 2001 (representing a reduction of -46%). For 2002, the reduction is from €2.49 to €1.24 per passenger (-50%).

Again, TAP appears to have recorded the largest impact from the sample with incremental security cost averaging €4.42 in 2002.

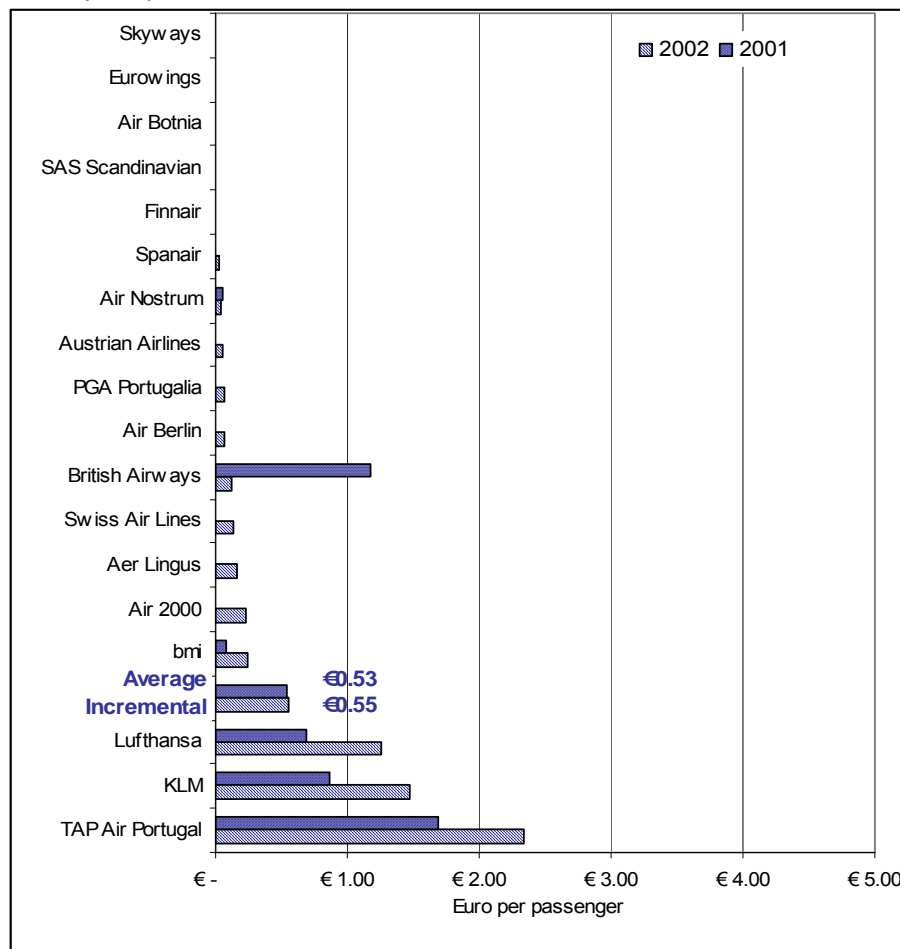
The group of full network carriers (i.e. Lufthansa, British Airways and KLM) have above average incremental costs compared to the sample of responses as a whole.

Regional and charter carriers incremental security related unit costs fall significantly when insurance is excluded. It would appear that most of the security related financial impact on these carriers is insurance related.

#### 4.5.5.4 Carrier incremental on-going security related costs

When insurance and capital expenditure items, such as reinforced cockpit doors, are removed from the incremental expenditure details provided by the responding carriers, an average incremental security cost for ongoing measures in 2001 and 2002 can be estimated.

**Figure 4-41: Carrier incremental security related expenditure excluding insurance and cockpit doors (2002)**



Source: Carrier security questionnaire  
Estimations: IAA / AviaSolutions

The weighted average incremental cost per passenger reduces by half when insurance is excluded from €0.99 to €0.53 per passenger for 2001 (representing a reduction of -46%). For 2002 the reduction is from €2.49 to €0.55 per passenger (-78%).

Network carriers TAP, KLM and Lufthansa recorded the largest weighted average incremental cost per passenger ranging from €2.33 to €1.26 for TAP and Lufthansa respectively in 2002. All of these are well above the weighted sample average of €0.55 per passenger.



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#### 4.5.6 Carrier expenditure conclusions

The previous analysis of incremental unit costs for the 19 responding carriers serves as a good representative sample base for estimating the total incremental cost for European carriers as a whole.

These estimations can help to understand the financial impact of incremental security measures on European carriers since 11 September 2001.

##### 4.5.6.1 Total European carriers

The total passenger market for European carriers is estimated at 466m and 483m for 2001 and 2002 respectively, based on 110 air passenger carriers in the 18 States.

The figure below provides an estimate, based on the large representative sample of responding carriers, of the costs for carriers based in the 18 States for the following:

- Total incremental security related costs.
- Incremental security related costs excluding cockpit doors.
- Incremental security related costs excluding insurance.
- Incremental on-going security related costs excluding cockpit doors and insurance.

**Figure 4-42: Estimated incremental security related costs for European carriers (2001 and 2002)**

	Incremental security expenditure for European carriers* (€million)			Estimated additional security expenditure from 11 September 2001 to end of 2002 (€million)
	2001	2002	Variation	
Total incremental security related costs	€ 461	€ 1,203	161%	€ 2,126
Incremental security related costs excluding cockpit doors	€ 461	€ 873	89%	€ 1,795
Incremental security related costs excluding insurance	€ 249	€ 596	139%	€ 1,094
Incremental on-going security related costs**	€ 249	€ 266	7%	€ 764

Key: (\*) 110 carriers based in 15 EU States plus Iceland, Norway and Switzerland (\*\*) excludes cockpit doors and insurance

Estimations: IAA / AviaSolutions

The incremental year on year security related expenditure (including insurance and cockpit doors) for all of the European carriers in the 18 States is estimated at €2.1bn from 11 September 2001 to the end of 2002. This represents incremental expenditures of €461m and €1,203m in 2001 and 2002 respectively.

When capital expenditure items such as reinforced cockpit doors are removed, the incremental operational security related expenditure is circa €1.8bn.

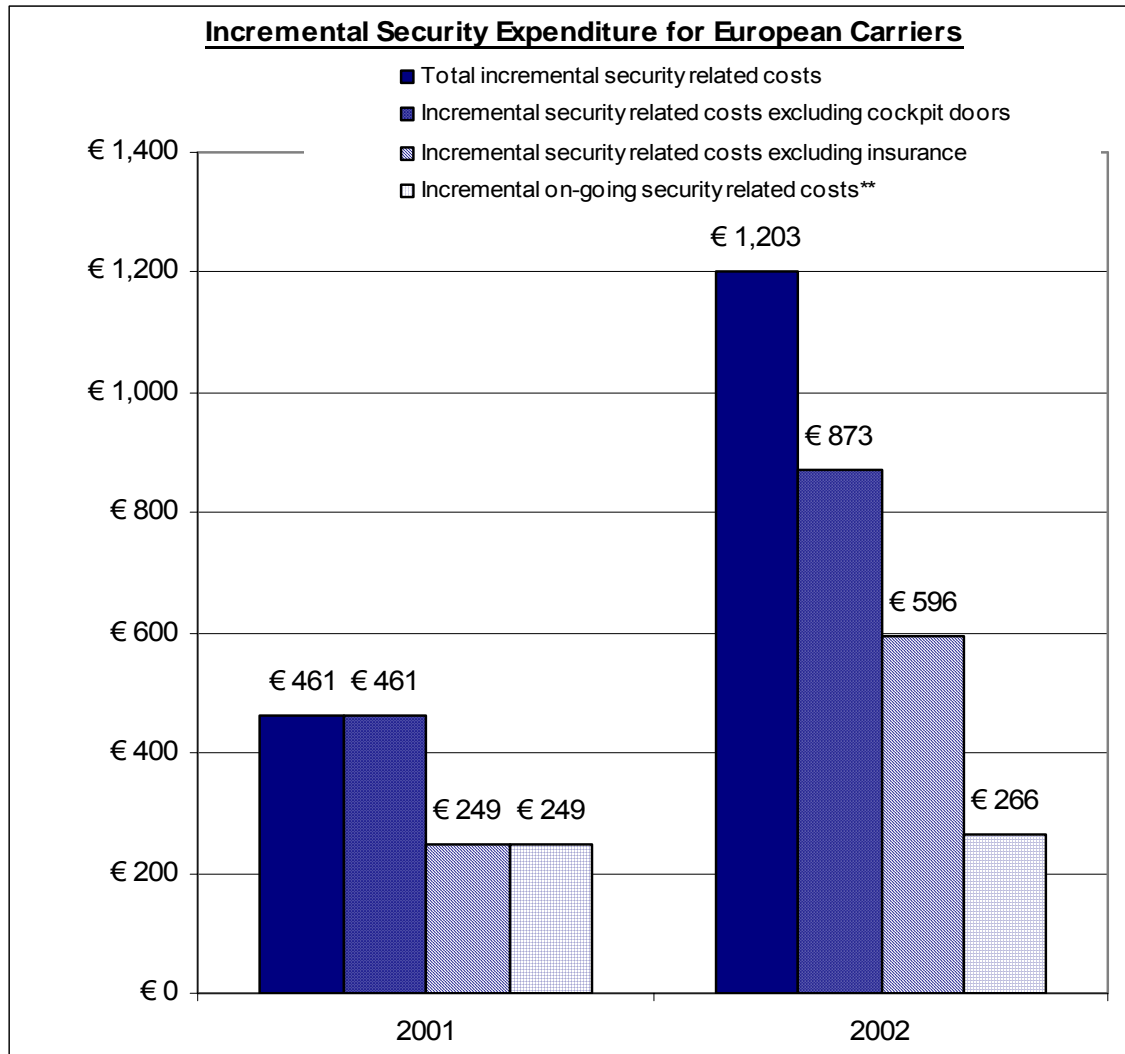
Similarly, if incremental insurance costs are stripped out but cockpit doors investments included, the incremental operational expenditure of on-going security related measures since September 2001 totals €1.1bn. When cockpit doors and insurance are removed, the estimated incremental on-going

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security related cost was €249m and €266 for 2001 and 2002 respectively. This results in a total incremental cost of €515m for 2002.

The following figure illustrates the estimated components of incremental security related expenditure for European carriers in 2001 and 2002.

**Figure 4-43: Estimated incremental security related costs for European carriers (2001 and 2002)**



Key: (\*) 110 carriers based in 15 EU States plus Iceland, Norway and Switzerland (\*\*) excludes cockpit doors and insurance

Estimations: IAA / AviaSolutions

The above figure illustrates the estimated total incremental security related expenditure for European carriers in the 18 States since 2000.

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#### 4.5.6.2 AEA carriers

Incremental security related costs for the full membership of the Association of European Airlines (AEA) were estimated separately.

Average incremental unit costs for AEA carriers are based on inputs from 11 responding carriers that are members of this association. The estimated total incremental security expenditure is based on AEA throughputs for 2001 and 2002.<sup>2</sup> Carriers providing financial data account for 57% of total AEA membership passenger throughputs.

The following figure shows the estimated incremental security expenditure for AEA carriers for each of the four components of security cost outlined above.

**Figure 4-44: Incremental security related costs for AEA carriers in 2001 and 2002**

	Incremental security expenditure for AEA carriers (€million)			Estimated additional security expenditure from 11 September 2001 to end of 2002 (€million)
	2001	2002	Variation	
Total incremental security related costs	€ 431	€ 814	89%	€ 1,676
Incremental security related costs excluding cockpit doors	€ 429	€ 581	36%	€ 1,438
Incremental security related costs excluding insurance	€ 237	€ 420	77%	<b>€894</b>
Incremental on-going security related costs**	€ 237	€ 216	-9%	<b>€690</b>

Key: (\*\*) excludes cockpit doors and insurance

Estimations: IAA / AviaSolutions

Incremental security expenditure, excluding insurance, for AEA carriers is estimated to range between €690m and €894m depending on whether or not expenditure on reinforced cockpit doors is taken into consideration.

These estimates are broadly in line with AEA's own estimates provided to the European Commission of €767m for incremental security related costs since 11 September 2001 through to the end of 2002. AEA's estimate is based on a weighted average from members accounting for 61% of AEA passenger throughputs in 2002. AEA's estimate includes reinforced cockpit doors but excludes insurance costs.<sup>3</sup>

## 4.6 Aviation security expenditure - Summary

Based on the large representative sample responses to the study from the States, airports and airlines, it is estimated that the security related expenditure in 2002 for the 18 States was in the region of €3.6bn. This is made up of €0.65bn for the States, €1.32bn for airports and between €0.5bn and €1.7bn for carriers<sup>4</sup>.

Cockpit door modifications for carriers were mostly carried out in 2002 and, as such, should not be a recurring exceptional cost. When these costs are excluded, the carrier total for 2002 reduced to

<sup>2</sup> Summary of Traffic and Airline Results (STAR) compiled by AEA. These excluded Aer Lingus passenger throughputs in 2001 and 2002 that have been added to the AEA's totals.

<sup>3</sup> As stated on AEA letter to European Commission dated 16<sup>th</sup> October 2003.

<sup>4</sup> Note that the carriers figure is incremental, as full costs were not provided by many of the respondents.

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€1.33bn (€873m + €461m). When insurance is excluded, the 2002 total carrier cost reduces to €845m (€596m + €249m). Likewise, when both insurance and cockpit doors are excluded, the total estimated incremental ongoing cost for 2002 is €515m (€249m + €266m) for all carriers. As such, the total cost for all stakeholders in the 18 States ranges from €2.5bn to €3.6bn as indicated in the figure below.

**Figure 4-45: Security costs for all stakeholders (2002)**

Estimative costs for all stakeholders (2002)	State (€m)	Airport (€m)	Carrier (€m)	Total (€m)
Total ongoing costs	654.1	1,321.5	515.0	<b>2,490.6</b>
Total ongoing costs and cockpit door modification costs	654.1	1,321.5	845.0	<b>2,820.6</b>
Total ongoing costs and insurance costs	654.1	1,321.5	1,334.0	<b>3,309.6</b>
Total costs including cockpit door modification and insurance costs	654.1	1,321.5	1,664.0	<b>3,639.6</b>

Source: Survey responses

Note: Carrier totals are additional costs on 2001 levels

Section 5 analyses the security related funding mechanisms and section 6 draws together the expenditure and income results for each State to provide a net result of the impact of aviation security related costs and funding mechanisms.