AVIATIONTRENDS

STATISTICS, ANALYSIS AND INFORMATION FROM THE SWEDISH TRANSPORT AGENCY 2012

SWEDISH TRANSPORT AGENCY

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Translations reviewed by Helena Kjellström, Swedish Transport Agency

FOREWORD

We have the pleasure of publishing Aviation Trends 2012. This magazine is published by the Swedish Transport Agency (Transportstyrelsen) and it is published in English for our international readers.

The articles in Aviation Trends 2012 are selected from the Swedish magazine Flygtendenser and range from the beginning of Swedish aviation 100 years ago to present challenges with development of risk based systems for oversight of civil aviation. The magazine also covers some facts about the Civil Aviation Department as well as flight safety and passenger statistics for 2011, all this to give the reader some information about the Swedish aviation market.

The long-term safety goal for all transport modes in Sweden is that no one should be killed or seriously injured as a result of an accident. Sweden has a good aviation safety record, the international cooperation within ICAO, Eurocontrol, EU and EASA has significantly contributed to this positive development by agreeing on common safety standards.

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The long-term safety goal for all transport modes in Sweden is that no one should be killed or seriously injured as a result of an accident. Sweden has a good safety record. The international cooperation within ICAO, Eurocontrol, EU and EASA has contributed to this positive development by agreeing on common safety standards.

In the early days of aviation focus was put on product development to improve safety. Later on, human factor and the organisations capability to cater for safety have been more and more emphasized as important factors for safety. The capability of organisations to implement common safety requirements within the framework of a safety management system will now be assessed.

This in turn will affect the way the competent authority, the Swedish Transport Agency, performs its tasks. Oversight should be more risk based and more focused on the safety culture within organisations. As competent authority we will face the same challenge as the organisations we oversee since we are required to implement our own quality system and to constantly assess our own performance in order to promote safety.

The aviation sector is highly competitive and the harmonisation of rules within Europe has enabled companies to establish operations all over Europe as part of the common European market. Our mission is to ensure that the industry can operate on a level playing field in all European countries.

Last but not least, we have to perform our tasks efficiently with regard to costs and resources. We must to a larger extent prioritize and constantly assess our efforts in order to uphold a good level of safety.

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Translation: Daniel Hellström

A COMMON SYSTEM FOR RISK BASED OVERSIGHT

Within the Swedish Transport Agency we continuously aim to improve our performance. We always carry out our mission professionally – with high quality awareness and according to relevant and effective procedures, while at the same time taking into account the costs endured by the industry. This way we promote a safe and secure Swedish aviation. During the last two years the Civil Aviation Department has been working on a project which aims to further develop the system for oversight of civil aviation.

A RISK BASED APPROACH

The Transport Agency in Sweden is currently adapting new principles on both financing and on how to charge the industry. In order to be able to do that we need to analyze how we conduct our work, if we do the right things the right way in order to prioritize our activities. This is the reason why we have been working on a project to develop a common system for oversight of civil aviation.

The system will increase the possibilities to systematically prioritize and allocate resources at all levels of the Civil Aviation Department. It will also make it easier to share information and experience between different areas of our oversight.

In the future we will focus more on monitoring the outcome of our operations, including continuous measuring and evaluation of safety related trends within civil aviation. We have established safety performance indicators (SPIs) in different areas which will be used for a risk based approach, as well as to give feedback to the industry.

The SPIs also provide us with the necessary means for decision making and for both short and long term prioritization of resources. One of the main principles of our operations is to be effective and to focus on the areas where we can do the most for a safe and secure civil aviation. That is what we usually call risk based oversight.

The development of our oversight is an important part of our quality work, which encompasses continuous improvements and it also aims to improve our own safety culture.

HOW CAN WE IMPROVE THE SAFETY CULTURE?

One challenge for the aviation industry is to conduct a profitable business while safety always remains the top priority. A mature safety culture is essential to create a balance between different objectives, with priority on safety. Our oversight activities must therefore aim to develop the safety culture within the aviation industry. This way we can continue to have a high level of safety within Swedish air transport and fulfill the overall safety objective.

The Swedish Government has, as one of the objectives for the transport area, the objective to continuously decrease the number of fatalities and serious injuries in civil aviation. This is challenging, especially when forecasts indicate an increase in air traffic.

A well-developed safety culture in civil aviation can, in some cases, even replace the need for new regulations and this is essential for our aim to have better regulations, both on a national and an international level.

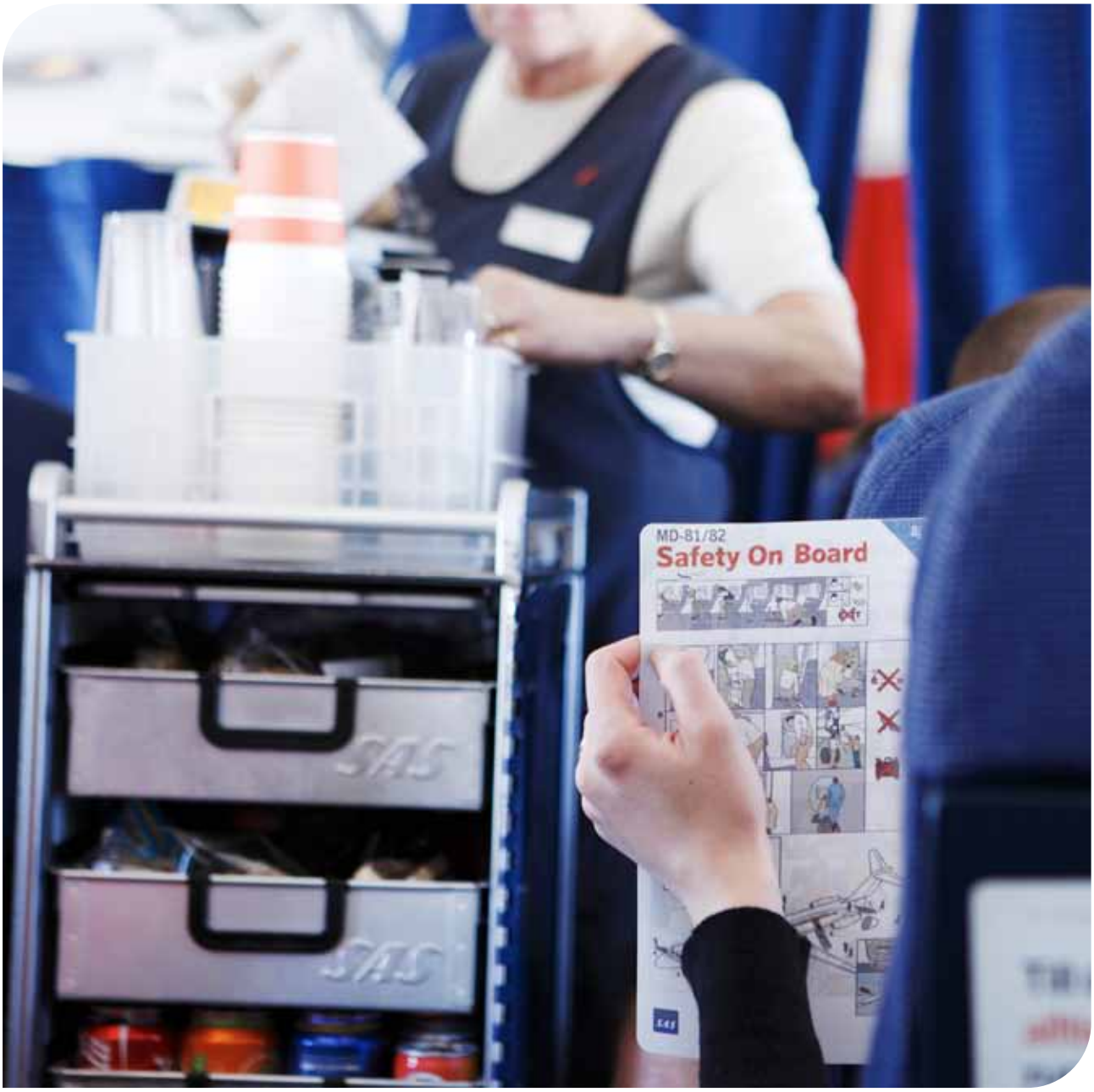
A system approach in our auditing of the industry is necessary in order to improve the safety culture in civil aviation. A system approach in auditing, or a system audit, focuses on the company´s quality and safety management and their ability to identify and correct deviations in the daily operations.

HOW CAN WE COORDINATE OUR SUPERVISION?

The common base for supervision in the Civil Aviation Department provides the necessary means for a uniform approach and a coordinated oversight. If an operator has more than one approval from the authority, we can audit all areas at the same time, if this is considered effective for both the authority and the operator. Audits can also be performed at different times, but in this case we exchange information to get an overall picture of the operator.

HOW WILL THIS AFFECT THE SWEDISH OPERATORS?

Inspectors in different areas will use the same methodology, work according to a common overall process and use the same templates. Operators will therefore be familiar with



the methods used by the authority, regardless of which part of the Civil Aviation Department they meet. Further on the industry will notice the increased focus on safety culture on the agency´s meetings with the industry, on audits and in different kind of information activities.

An operator's management and quality system is fundamental to a good safety culture. The competence in the management area and the ability to find and correct deviations will always be the main focus in our contacts with the industry. In this way we believe that we can improve the safety culture to ensure a continuously safe and secure air transportation system in Sweden.

Jean-Marie Skoglund
Translation: Britt-Marie Kärlin and Per-Göte Lundborg

SWEDISH AVIATION YESTERDAY, TODAY AND TOMORROW

A couple of years ago Swedish aviation celebrated its centennial. The commercial part of it is a bit younger, by about ten years. Up until the 1950s the base of the commercial aviation consisted of transporting newspapers and mail. Compared with road and rail, air is a rather new means of transport and it had a relatively small share of the transport sector until the 1980s. In spite of the modest beginnings the interregional air traffic has enjoyed a steady growth since 1965. The number of airline passengers in 1965 was 2.5 million and in 1990 there were 18 million passengers. The biggest growth took place during the 1980s while the 1990s were characterized by major changes in Swedish domestic aviation.

Over one hundred years ago, on 17 July 1910, Baron Carl Cederström completed his historic flight in Stockholm. He had learned to fly in Paris and in 1912 he started the first flying school in Sweden. He later became instrumental in the setting up of an aircraft manufacturing outfit in the Stockholm area. Baron Cederström was killed during a ferry flight to Finland in 1918.

THE FIRST SWEDISH AIRLINES

The first airlines in Sweden were Svenska Lufttrafik Aktiebolaget (SLA) and P.O. Flygkompani, both established in 1919. SLA was first with an international route, that between Malmö and Copenhagen; P.O. Flygkompani started up the first domestic route, between Porjus and Suorva in northern Sweden, followed by an international route Stockholm – Åbo – Helsinki. However, the lack of demand forced the cancellation within a few weeks and in the fall of 1923 P.O. Flygkompani ceased to exist.

Neither of the two airlines received any financial assistance from the Government, in contrast to airlines in other countries.

THE FLORMAN BROTHERS – PIONEERS IN SWEDISH COMMERCIAL AVIATION

Commercial aviation history in Sweden is closely linked to Aktiebolaget Aerotransport (ABA), founded by the brothers Adrian and Carl Florman in 1924.[1] They recognized the importance of aviation and were worried that foreign air carriers – in particular German – would establish themselves in Sweden and subsequently dominate the market.

LOBBY FOR GOVERNMENT SUPPORT

ABA, like many other airlines in Europe depended on mail delivery contracts. By forming a lobby group ABA managed to make the Post office grant them such a contract, which became the foundation for the airline's continued survival. The lobby group later influenced the Swedish parliament to establish an aviation fund to help airlines finance the acquisition of expensive aircraft. They also managed to convince the Swedish parliament to invest half a million Swedish kronor in ABA and in return receive certain influence in the company, which meant stability and monopoly for ABA.[2]

THE GOVERNMENT TAKES CONTROL OF ABA

In the beginning of the 1930s the State took control of ABA to secure its survival. With the State as a major stakeholder ABA was able to establish both domestic and international routes, and it became the only Swedish airline to maintain service to the rest of Europe during the Second World War.

THE GROWTH OF SCHEDULED TRAFFIC UNDER ABA

ABA's first scheduled flight took place on 2 June 1924, from the seaport at Stockholm/Lindarängen to Helsinki. The plane was a German-registered Junkers F 13 floatplane with a German crew. More routes were added the same year: Malmö – Hamburg and Malmö – Copenhagen. A rapid expansion followed, and the Malmö/Bulltofta airport became the base for ABA until 1936 and the opening of Stockholm/Bromma airport. In 1937 ABA acquired the Douglas DC-3 aircraft which allowed for an expansion with new and longer routes.

DC-3 Orvar Viking. The Douglas DC-3 was used by American Airlines on the first flight 1935. ABA was first in Europe to purchase three DC-3 aircraft. The first regular flight with "Orvar Viking" was performed in 1948. The plane had 21 seats. Photo: SAS.

During the Second World War there was a major reduction of the route structure. In 1942 ABA started a courier service to Scotland – an undertaking which resulted in two of its DC-3 aircraft being shot down. A third aeroplane was attacked but managed to reach Bromma with countless bullet holes in it.

Having become State owned during the 1940s, ABA started to negotiate with the United States on an agreement to start up traffic across the Atlantic, and to acquire the four-engined DC-4 aircraft in order to extend the courier route to New York. However, ABA's requests were turned down due to foreign policy reasons.

WALLENBERG AND SILA – THE SECOND PART OF SAS

Already in the late 1930s there were thoughts of a Nordic collaboration within aviation and in particular within the North Atlantic traffic and talks were held between the Nordic airlines and Pan Am in New York. However, the outbreak of the war prevented the start-up of air traffic to the U.S.

However, a new Swedish airline started up at the instigation of Sweden's Prime Minister, who asked the Swedish industrialist Marcus Wallenberg to form a privately owned airline. Thus Svensk Interkontinental Lufttrafik AB (SILA) was founded in 1943. As a private enterprise without governmental or political involvement, SILA could resume talks with the Americans. These were fruitful and SILA obtained traffic rights to the U.S., and also ordered ten Douglas DC-4 aircraft. These could not be delivered until the end of the war, but it was possible to use ten American B-17 aircraft that had made emergency landings in Sweden. SAAB, in the town of Linköping, converted the aircraft for passenger use with 14 seats. SILA managed to revive the courier line to Scotland with an extension to New York, a trip of almost 50 hrs. The B-17s were later replaced with the DC-4s.

SILA and ABA did not see each other as competitors but rather divided the market between them. In 1944 SILA became responsible for the intercontinental traffic since they had operative permit to North America, while ABA operated Europe and the domestic routes.

THE CREATION OF SAS

When the war ended in 1945 the negotiations between Norway, Denmark and Sweden about the formation of a common Scandinavian airline were restarted. Eventually Scandinavian Airlines System (SAS) was formed as a consortium with the following ownership structure; 3/7 for Sweden, 2/7 for Norway and 2/7 for Denmark. It was also decided that SAS should be responsible for the North and South American traffic. The first SAS flight took off on 17 September 1946, from Stockholm/Bromma to New York with stop-overs in Copenhagen, Prestwick, and Gander, Newfoundland.[3] Routes to South America were opened up in November the very same year.

While SAS handled the traffic to North and South America the individual airlines (ABA, DDL and DNL) competed for traffic within Europe, Asia and Africa. The limited market meant economic instability for the airlines. It was therefore decided in 1948 that SAS should co-ordinate the European traffic under the name European Scandinavian Airlines System (ESAS). This concluded the second phase in the creation of SAS and meant that SILA and ABA merged the same year under the "new" ABA. When the owners of SAS decided that SAS should take over the traffic from the private airlines the last phase was completed in establishing SAS, and the individual airlines ceased to exist as independent operators.

DOMESTIC AVIATION STARTED WITH NEWSPAPERS

Commercial aviation in Sweden started with newspaper and mail delivery flights, as in many other countries. The opening of the Stockholm/Bromma airport in 1936 meant possibilities for ABA to further develop domestic aviation. However, after a few years the Second World War hampered flight operations to a large extent.

Post-war optimism saw many new routes open, but a lot of them could not be sustained for more than a few years. Besides SAS/ABA several new airlines were formed, initially based on newspaper carriage (and owned by the newspapers) and with a wide-spread network. Depending on the space available, passengers could also be accommodated.

AMALGAMATION CREATES LINJEFLYG

Although SAS had sole domestic passenger traffic rights, a time came when it was opportune to look at collaboration with the other airlines. Talks resulted in the formation, on 2 April 1957, of the Swedish domestic airline, Linjeflyg (LIN), jointly owned by the newspapers and SAS. The domestic routes were divided between SAS and LIN. SAS operated the

Boeing 299 (B-17) also called "The Flying Fortress" in front of the hangar at Stockholm/Arlanda. Photo: SAS

domestic routes on the so called trunk routes: Stockholm – Göteborg, Stockholm – Malmö and Stockholm – Luleå – Kiruna, and the remaining domestic routes were given to Linjeflyg with sole operating rights.

It took until the end of the 1950s before passenger traffic exceeded newspaper and mail delivery traffic. There was a steady growth from the 1950s to the 1970s, but domestic aviation nevertheless remained a small part of the total Swedish transport sector, and was thought of as a means of transport reserved primarily for businessmen.

SVENSK FLYGTJÄNST/SWEDAIR AB – THE "JACK OF ALL TRADES"

There is no other airline that has had such a diversified operation as Svensk Flygtjänst/Swedair: aircraft rental, target flights, fixed-base operations, maintenance, charter, taxi, and regional flights.

Svensk Flygtjänst AB was established in 1935 by the young Tor Eliasson, only 21 years old. Eliasson visited England in 1934 on a language trip and during his visit he obtained his pilot's license. On his return to Sweden he began to rent airplanes to all kinds of customers, including Stockholm's Flying School and other pilot training outfits. It is, however, target towing and target practice flights which are mostly associated with Svensk Flygtjänst.

Svensk Flygtjänst later became interested in newspaper and passenger flights, and in 1974 the State-owned feeder operator Crownair was contacted with a view to a possible takeover. This actually happened, and Swedair AB was created. However, following a general downturn in domestic traffic, Swedair was incorporated into SAS in 1994.

DOMESTIC AVIATION "TAKING OFF"

The major emergence of Swedish domestic aviation took place during the 1980s, when air transport for the first time was seen as an alternative to road and rail transport. In 1978, Linjeflyg's General Manager, Jan Carlzon, started a marketing campaign under the slogan "The whole of Sweden for

Boeing 727. Photo: Transair Sweden.

half the price". The objective was to attract new categories of travellers such as pensioners, families with children and students; groups that earlier on had constituted only a very small part of the domestic aviation share of the market. A fare policy with special prices and discounts was meant to attract these new groups. A new fare was introduced, the so called "100-note", which meant that youths under the age of 26 could fly anywhere in Sweden for just 100 Swedish kronor. Linjeflyg's campaign resulted in a major increase of domestic air passengers – 44 percent already during the first year.

For the first time air transport picked up the fight with other means of transportation, in particular the railway, to serve the broad public in their travels by public transport.

An important factor that contributed to the avalanche-like increase in domestic air traffic was the centralisation to Stockholm/Arlanda airport in 1983. The concentration of domestic aviation to Arlanda combined with Linjeflyg's new strategy became the most important prerequisite in the development of domestic aviation during the 1980s.

The role of the domestic aviation became crucial during the 1980s. The period 1965 – 1990 saw an annual growth in domestic air travel of 10.3 percent. In 1965, a total of 750,000 passengers were carried; in 1988 the number was close to 8.6 million.

DEPARTURE TO PALMA DE MALLORCA WITH TRANSAIR

A new trend in air travel firmly established itself in the late 1950s – the charter flights. The airlines offered available weekend capacity to charters. Transair is closely associated with the charter breakthrough in Sweden. The company was established in 1951 and was based at Stockholm-Bromma until 1961 when it moved to Malmö-Bulltofta. Transair started operations by flying newspapers, but soon discovered the approaching tourist expansion to warmer latitudes in the Mediterranean.

Sweden, together with the rest of the Western world, experienced an economic expansion and prosperity during the latter part of the 1950s and during the 1960s, leading to a strong purchasing power. Transair initiated charter flights to European destinations such as Hamburg, Marseilles and Pisa.[4] 1959 was the start of charter flights to one of the most popular charter destinations for Swedish tourists: Palma de Mallorca. The route was initially operated by a DC-3 and took 24 hours. Later the same year GranCanaria/Las Palmas was incorporated into the airlines charter offer, and six DC-6s from SAS were acquired for this operation. SAS took over 50 percent of Transair in 1958 in order to save the company from bankruptcy.

Transair entered the jet age in 1967 by obtaining four Boeing 727s and became Europe's leading charter airline, with Vingresor and Spies as travel agents. When SAS launched Scanair and when Vingresor migrated to that company it meant an economic setback for Transair. It soon became obvious that SAS planned to transfer all charters to Scanair, and in 1981 the SAS board decided that Transair should cease operations the very same year.

THE DEVELOPMENT OF AIRPORTS

Sweden's oldest today operating civil airport is Norrköping/Kungsängen (1934). But already in the 1920s Sweden had two civil airports, Bulltofta in Malmö (1923) and Torslanda in Göteborg (1923). In Stockholm a seaport was established at Lindarängen which served as Stockholm's only airport until the opening of Bromma in 1936. When newspaper flights started in earnest during the 1940s many more airports were constructed.

Table 1 shows airport development from 1920 to 1990. The first Swedish commercial airports built in the 1920s and 1930s were operated by local municipalities. However, some of the larger airports were transferred to the State during the 1940s.

During the last 15 years the airport system has undergone a reconstruction. Firstly, in connection with the domestic aviation crisis in the beginning of the 1990s, and the weak economic growth of the domestic aviation, many airports, such as Hudiksvall, Söderhamn, Gävle, Norrköping, Linköping, Hultsfred and Skövde, lost their domestic traffic. The competition from rail and road transport is the major reason.

Secondly, since the beginning of the new century more state-run airports have been taken over by local authorities: Kalmar, Norrköping, Halmstad, Jönköping, Örnsköldsvik, Skellefteå and Karlstad. The State, via Swedavia, is planning to limit its ownership to 10 airports: Kiruna, Luleå, Umeå, Åre/Östersund, Stockholm/Arlanda, Stockholm/Bromma, Visby, Göteborg/Landvetter, Ronneby and Malmö. The remaining – Sundsvall/Härnösand – will in the near future be transferred to local and regional authorities.

TABLE 1 The establishing of Swedish civil airports from the 1920s to 1990s.

1920s	1930s	1940s	1950s	1960s	1970s	1980s	1990s
Lindarängens/ flyghamns *(1911–1936)*	Norrköping/ Kungsängen *(1934)*	Midlanda *(1945)*	Östersund *(1958)*	Kiruna *(1960)*	Oskarshamn *(1970)*	Mora *(1980)*	Arvidsjaur *(1990)*
Malmö/Bulltofta *(1923–1972)*	Bromma *(1936)*	Luleå/Kallax *(1944)*	Kalmar *(1957)*	Skellefteå *(1961)*	Gällivare *(1970)*	Göteborg/ Säve *(1984)*[6]	Storuman *(1993)*
Göteborg/Torslanda *(1923–1977)*		Visby *(1942)*	Halmstad *(1958)*	Umeå *(1961)*	Gävle *(1970)*		Hemavan *(1993)*
		Karlstad *(1945–1997)*	Hultsfred *(1958)*	Örnsköldsvik *(1961)*	Sturup *(1972)*		Karlstad new airport *(1997)*
		Skavsta *(1984)*[5]	Rinkaby *(1920–1960)*	Lycksele *(1968)*	Kramfors *(1974)*		Pajala *(1999)*
			Ronneby *(1958)*	Arlanda *(1960)*[4]	Växjö-Öjaby *(1975)*		
				Jönköping *(1960)*	Linköping-Saab *(1977)*[3]		
				Ängelholm *(1960)*	Landvetter *(1977)*		
				Kristianstad *(1960)*	Trollhättan *(1974)*[1]		
				Eskilstuna *(1969)*	Växjö *(1975)*		
				Borlänge *(1962)*	Örebro *(1979)*		
					Västerås *(1976)*[2]		
					Vilhelmina		

The military airports at Luleå, Gävle, Borlänge, Eskilstuna, Kalmar, Ronneby, Halmstad, Ängelholm and Kristianstad were built earlier than shown in the table (it indicates when the airports were opened for civil flights).

[1] Saab established an airport in Malöga, Trollhättan, already in 1937. Today's airport opened 1974.

[2] A military airfield was established in 1944 at Hässlö.

[3] The airport was built during the 1930s but opened for civil flights in 1977.

[4] Arlanda opened 1 April 1962, but civil flights started already in 1960.

[5] Skavsta opened for civil flights 1984. Military operations ceased in 1980.

[6] Göteborg/Säve airport opened in 1940 as a military airport which ceased operation in 1969. The airport opened for civil flights in 1976. In 1984 the runway was extended and adapted for large aircraft.

TRANSFORMATION OF THE SWEDISH MODEL

In the beginning of 1990 two changes occurred which would have a decisive effect on commercial aviation in Sweden. Domestic aviation showed a notable decrease in the amount of passengers (although a partial recovery took place in the mid-90s) and the new century also saw a steady decline in domestic air traffic. On the other hand, international air traffic showed an increase in the 1990s with the exception of the years 1990 – 1991. During later years two dramatic declines in international traffic have occurred, during the years 2001 – 2002 and 2008 – 2009, while the remaining period has been characterized by rapid growth.

During the 1990s an avalanche of deregulation and re-examination of many different branches took place throughout Europe and Sweden, and commercial aviation was no exception. The two processes mentioned above turned out to have a major influence on the Swedish model of aviation and its foundations started to crumble.

DOMESTIC AVIATION STAGNATES DURING THE BEGINNING OF THE 1990s

Domestic aviation reached its highest passenger volume of 8.7 million in 1990. There was a downturn in 1991 with a drop of 1.5 million passengers, and the decline continued. By 1996, 25 percent of the domestic passengers had disappeared.

At the end of 1990s there was a substantial increase – during 1997/98 alone there was a growth of 10.5 percent. At the same time as the economic decline in the beginning of the 1990s took place, the Government introduced a 12-percent tax on travel (later reduced to six percent) which intensified the drop in domestic air travel. In addition, the competition from the new trains introduced by the Swedish State Railways (SJ) had a negative impact on air travel. While the domestic traffic dropped and stagnated, the international air traffic showed a steady growth of about 7 percent between the years 1990 and 1998. The explanation to the increase can to some extent be found in Sweden's entry into the EU.

DEREGULATION – MORE OPERATORS AND CONSOLIDATIONS

Between the years 1940 and 1992, SAS and Linjeflyg had gained a unique position in the Swedish air travel market, but which in terms of international market share was not all that unique in comparison.[5] SAS/Linjeflyg's share of the domestic traffic amounted to 95 percent. On routes which were not operated by SAS/Linjeflyg, smaller regional airlines were allowed to operate, with approval from SAS/Linjeflyg.

During the late 1980s, airlines such as Transwede, Malmö Aviation and Nordic East Airways applied for permits to operate domestic flights on numerous routes where SAS/Linjeflyg had sole rights. Despite the rejection from the Government a debate about Swedish aviation policy was initiated. When the deregulation swept over Europe, affecting several different spheres of activity, it became untenable for Sweden to continue with a monopoly position. Furthermore, the Government had previously decided on a deregulation of the taxi- and telecom branches.

In 1992 the Government decided on a complete deregulation of domestic aviation. The decision had been preceded by a State inquiry ("Competition within Domestic Aviation", Konkurrenskommittén, SOU 1990:58) that suggested a deregulation in two steps. The first step was to open for competition only on those routes where the yearly capacity exceeded 300,000 passengers. The second step was to implement, after three years, a complete deregulation of domestic aviation. The Government decided to subscribe to the suggestion of a gradual deregulation. However, it was decided that SAS and LIN were to compete in the domestic aviation sector right from the start. When SAS in 1992 incorporated LIN into the rest of the operation (wherein LIN ceased operation as an airline) the conditions changed and the Government made the decision of a total deregulation of the domestic aviation sector.

Following the deregulation domestic aviation has been characterized by rapid changes, with airlines having difficulties from time to time to sustain. During the first decade after the turn of the century travel agents ("virtual airlines") with a pronounced local and regional profile appeared. This regional or local profile was also reflected in the actual ownership; these airlines have then gradually taken market shares, mostly from SAS. One example is Visby and Ängelholm where Gotlandsflyg respectively Kullaflyg have the entire or the major share of the Stockholm traffic.

LOW COST CARRIERS REVOLUTIONIZE THE DEMAND FOR INTERNATIONAL TRAFFIC

In pace with the globalisation and Sweden's EU membership in 1995, together with the deregulation of aviation within the EU, the international air traffic (in particular within Europe) showed a steady growth during most of the 1990s. Airports such as Stockholm/Skavsta and Göteborg-City, with predominantly Low Cost Carrier (LCC) traffic, have rapidly become among the largest airports in Sweden. LCCs have over the past ten years taken a substantial share of the market at the expense of the "flag carriers" on the

inter-European market, and, in so doing have induced a greater cost consciousness among the traditional airlines.

In the end of the 1990s the LCCs began operating on the domestic market. The Göteborg based LCC Goodjet introduced domestic traffic in 1997 on the routes Stockholm – Malmö and Stockholm – Göteborg. Since then many LCCs, such as FlySWE, FlyMe, and Sterling, have come and gone in the Swedish domestic market.

THE FUTURE?

During the last one hundred years Swedish aviation has undergone extensive technical and market changes. Faster and safer aircraft, more passengers, new airline alliances, more airports etc. have all played a part in air traffic becoming a common means of transport. With the first 100-year anniversary passed, it begs the question what the next 100 years have in store for Swedish aviation. One thing is for certain, the border between domestic and international traffic will become less distinct, especially for traffic within the EU. International traffic has traditionally been tied to a few of the country's airports: Stockholm/Arlanda, Göteborg/Landvetter and Malmö. Today, and surely in the future, we will see the fragmentation of international traffic and more and more airports will get international traffic.

And, who knows, perhaps in another hundred years we will have traffic far outside our atmosphere with the new "Space travel" hub in Kiruna!

1. The Swedish newspaper Dagens Nyheter summarizes, on 14 December 1924 the start of ABA as "the year 1924 will be seen as a revolutionary year for Swedish aviation history. There is no denying the importance of the Florman brothers as pioneers for the international aviation with their Aerotransport company".
2. Soderberg Nils, "Svenskt Trafikflyg 50 år" Flyghistorisk Revy June 24, 1974, p.40.
3. In reality, SAS flew the first trans-Atlantic flight on 5 August 1946, using one of SILA's DC-4 aircraft.
4. Svensk Bussresetjänst in Örebro signed a contract with Transair in 1953 for 20 flights to Hamburg and later an additional 12 flights to Marseilles and Pisa.
5. The European aviation market was, until the 1990s, characterized by "National Carriers" which had sole rights to operate both domestic and international flights.

Per-Göte Lundborg
Translation: Gerd Lundberg

AVIATION TECHNOLOGY IN SWEDISH MUSEUMS

A nice and easy way to learn more about aviation technology would be to visit museums with exhibitions of the technical development in aviation. Below you will find a list of some Swedish museums with interesting exhibitions on the topic.

Flygvapenmuseum. Photo: Göran Billeson

SWEDISH MUSEUMS

Flygvapenmuseum, Linköping/Malmen	www.flygvapenmuseum.se
Aeroseum, Göteborg/Säve	www.aeroseum.se
Arlandasamlingarna	www.arlandaflygsamlingar.se
Jämtlands Flyg- och Lottamuseum, Östersund	www.flygochlotta.se
Tekniska Museet, Stockholm	www.tekniskamuseet.se
Svedinos Bil- & Flygmuseum, Ugglarp	www.svedinos.se
RFN museum, Vidsel	www.vidsel.nu/rfnmuseum
Västerås Flygmuseum	www.flygmuseum.com
Ängelholms flygmuseum	www.engelholmsflygmuseum.se
Arboga Robotmuseum	www.robotmuseum.se

There are also museums where you can find exhibitions on the technical development in areas related to aviation, such as the radio museums in the cities of Motala and Göteborg. On the website www.flyghistoria.org, you can find a link to a complete list of Swedish aviation museums.

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OCCURRENCE REPORTING IN SWEDEN

A crucial part of the flight safety work is the occurrence reporting system, whereby incidents, serious incidents and accidents are reported. Conclusions can then be drawn from the reported incidents in order to prevent reoccurrences. Reporting has been mandatory in Sweden since 2007, and the number of reported occurrences has increased since then.

Which kind of occurrences that shall be reported and who is responsible for reporting is regulated in LFS 2007:68[1] (Swedish Transport Agency regulations and guidelines on occurrence reporting in civil aviation).

The reports are coded in accordance with an international system and stored in a database (ECCAIRS)[2] common to the EU states. An assessment of the need for possible action concerning an occurrence is made. The information is de-identified and used for statistical purposes to obtain valuable information as part of the safety work.

Overall feedback is provided in the form of statistics[3] and analysis published on our website and in the Swedish version of this publication, *Flygtendenser*. The Swedish Transport Agency is continuously striving to improve its feedback in order to promote reporting. Among the reporters you can find operators from all branches of aviation – aerodromes, air traffic control, pilots, airlines and flying clubs.

Figure 1 shows the number of reported occurences 2002 – 2011 and Figure 2 shows the distribution of occurrence categories during 2011. About 19 percent of the reports were of the occurrence type Technical – ANS, followed by Airspace infringement and Communication (about 7 percent each).

ACCIDENTS AND SERIOUS INCIDENTS DURING 2011

The definition of an accident can be found in Annex 13 to the Convention on International Civil Aviation and also in Regulation (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation.

FIGURE 1 Number of reported occurrences 2002 – 2011

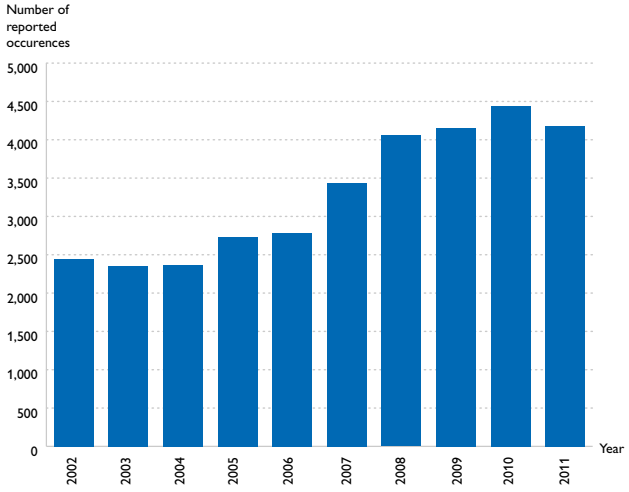
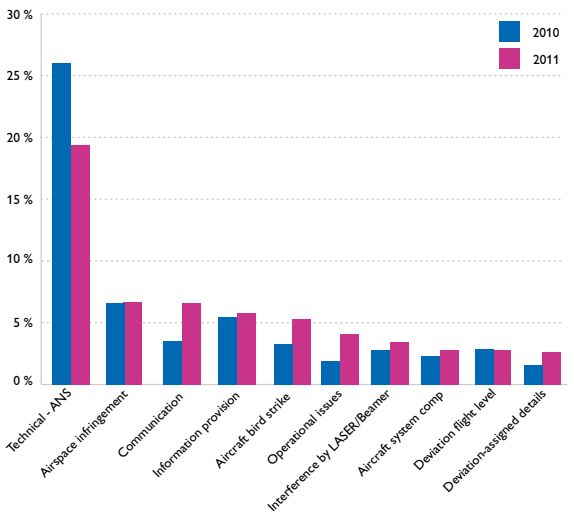


FIGURE 2 Occurrence reports by event category 2010 – 2011



An accident is an occurrence to which one or more of the following is applicable:

- A person is fatally or seriously injured;
- The aircraft sustains damage or structural failure which adversely affects the structural strength, performance or flight characteristics of the aircraft;
- The aircraft is missing or is completely inaccessible.

The difference between an accident and a serious incident lies only in the result. The classification of the degree of seriousness in an occurrence is made using an international standard.

During 2011 there were 33 accidents involving aircraft on the Swedish register: 15 involving general aviation aeroplanes, 10 microlight aeroplanes, seven paragliders/hang gliders and one involving a helicopter performing aerial work. During 2010 there were 39 accidents (see Table 1).

TABLE 1 Number of accidents involving aircraft on Swedish register by type of aircraft 2010 and 2011

Type of aircraft	2010	2011
Aeroplane	13	15
Helicopter	4	1
Microlight	7	10
Glider	2	-
Paraglider/hang glider	13	7
Total	**39**	**33**

There were 10 serious incidents during 2011.

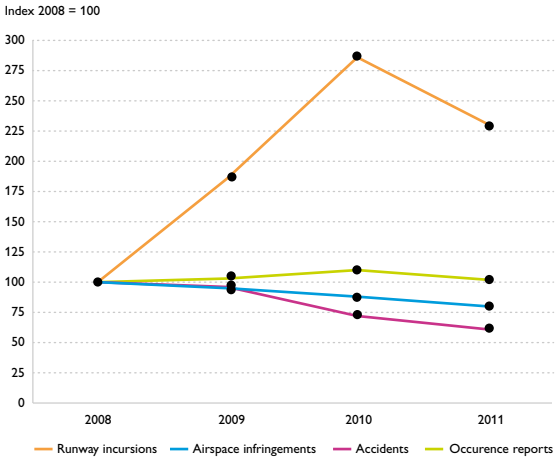
ANALYSIS AT THE CIVIL AVIATION DEPARTMENT

The Safety Performance Indicators (SPIs) is the backbone of the Civil Aviation Department's flight safety efforts with a continuous trend monitoring and analysis of the safety level in aviation. In this endeavour we are also keen on regularly re-connecting the results of trend monitoring and analysis to the industry and, beyond this journal, this is also done through our website and at seminars.

SUMMARY OF THE 2011 SAFETY PERFORMANCE INDICATORS

In order to provide an overview we will present a short analysis of the outcome for 2008-2011 within four of our SPIs. *Accidents, occurrence reports* and *airspace infringements* indicate a stagnation of occurrences from 2008 to 2010 while *runway incursions* indicate an increase during the same time. However, from 2010 to 2011, all these four SPIs indicate a decreasing trend, which is positive, in particular considering that the sharp increase of the number of runway incursions has been broken, see Figure 3 below.

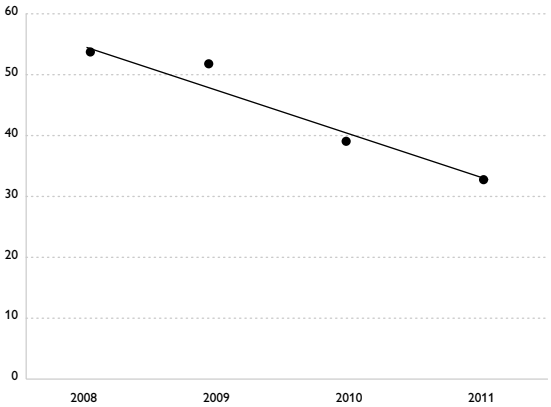
FIGURE 3 Safety Performance Indicators, development 2008 – 2011.
Note: index scale, not absolute number of occurrences



ACCIDENTS

The number of accidents shows a downward trend from 2008 to 2011 (see Figure 4). This is positive and can contribute to achieving the Swedish Government transport policy objective of a decreasing number of fatalities and serious injuries within aviation.

FIGURE 4 Number of Accidents 2008 – 2011



OCCURRENCE REPORTS

This SPI shows the development of all occurrence reports received by the Transport Agency's Civil Aviation Department, excluding information related to aviation security.

The number of occurrence reports increased from 2008 to 2010. From 2010 to 2011, the number of reports decreased slightly (about 8 percent), while the increase from 2009 to 2010 was about 8 percent. Still, the overall trend is slightly increasing, see Figure 5 below.

FIGURE 5 Number of Occurrence reports 2008 – 2011

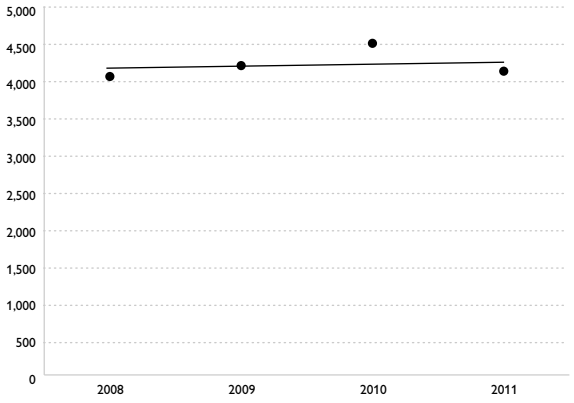
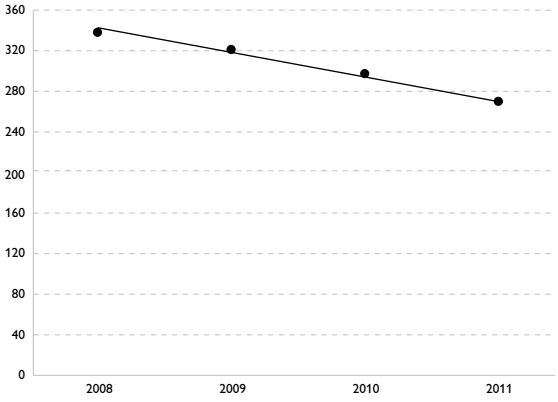


FIGURE 6 Number of Airspace infringements 2008 – 2011



AIRSPACE INFRINGEMENTS

An airspace infringement occurs when an aircraft enters (or flies within):

- a controlled airspace without clearance;
- a traffic information zone (TIZ) without establishing two way radio communication;
- a traffic information area (TIA) without establishing two way radio communication;
- a defined area for military exercises and training activities without permission, such as a dangerous area, a restricted area or a temporary reserved area (TRA).

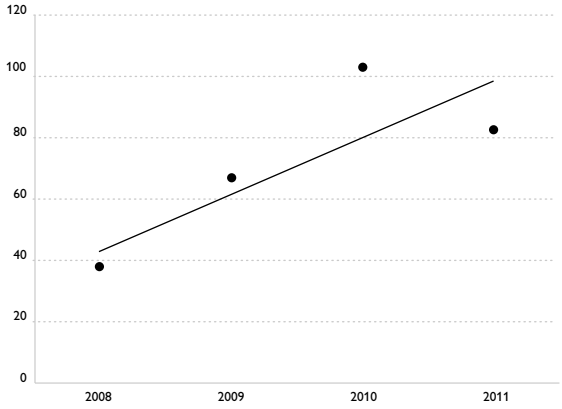
The number of airspace infringements is decreasing, see Figure 6. The Swedish Transport Agency's Civil Aviation Department is actively taking measures to reduce the number of airspace infringements in accordance with the European Action Plan for Airspace Infringement risk reduction, and a Swedish Action Plan is being developed. A seminar dedicated to airspace infringement was held in June 2011, during which contact persons for each group of participants (Air Navigation educational organizations, airspace users, suppliers of aeronautical information and meteorological services and the Armed Forces) were appointed. The appointed contact persons and their organizations will (based on the European Action Plan) propose appropriate actions within their respective areas. These actions, combined with the Swedish Transport Agency's actions will subsequently form the basis for the Swedish Action Plan against airspace infringements, which the Swedish Transport Agency plans to complete during 2012.

RUNWAY INCURSIONS

A runway incursion occurs when an aircraft, vehicle or a person without clearance/permit enters or is located on the protected area for takeoff and landing at an airport. The protected area includes the runway and a buffer zone around it. The overall trend is that the number of runway incursions increases, particularly for the years 2008 to 2010, see Figure 7 below. However, in 2011, the rapidly increasing trend was broken and less runway incursions occurred than in 2010; the total number was actually about the same number as in 2009.

The Civil Aviation Department is actively trying to reduce the number of runway incursions, and a runway safety seminar is being held in the autumn of 2012. The seminar will address both runway incursions and excursions, based on the European Action Plans.

FIGURE 7 Number of Runway incursions 2008 – 2011



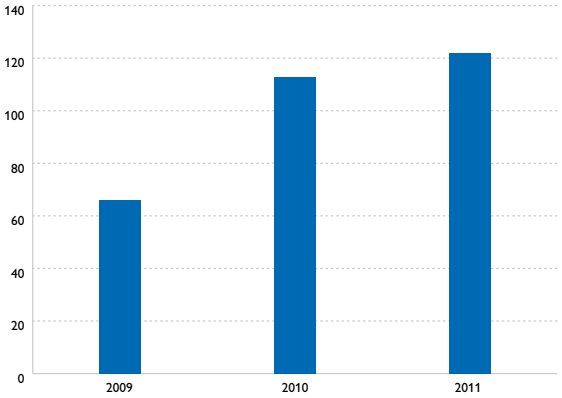
NEW SAFETY PERFORMANCE INDICATORS TO MONITOR IN 2012

Before the end of 2011 it was decided that the safety performance indicators to be monitored needed to be updated. In addition to the already existing areas presented above, categories such as *fatalities and serious injuries, runway excursion* and *laser interference* were added. There are also areas to be monitored from a qualitative point of view, such as *fatigue* and *highly automated technical systems.* These two areas have drawn attention both internationally and nationally which is why the Civil Aviation Department is also keen to monitor trends and investigate better ways to adress them.

LASER INTERFERENCES IN AVIATION

Laser interferences, where individuals are using so-called laser pointers/beamers (usually ”green laser”) and direct them towards aircraft, usually during approach and landing is increasing. This can affect the crew’s vision adversely, and in the worst case it can cause permanent damage to the affected pilots’ eyes. Other modes of transport such as buses, trains and subways are also affected. In Sweden, as in Europe, the number of laser interferences has increased sharply in recent years (see Figure 8 below), while several measures have been taken to reverse the trend and reduce the number of incidents. The Swedish Transport Agency is closely monitoring the trend and collaborates with the National Police and other concerned authorities to improve the situation. The Swedish Transport Agency invites operators to report laser interference occurrences in aviation to both the Swedish Transport Agency and the police so that the latter can take action on individual cases, whilst the Swedish Transport Agency monitors the overall situation and trends.

FIGURE 8 Laser interferences 2009 – 2011



1. LFS 2007:68 is the Swedish implementation of EU-directive 2003/42/EC on occurrence reporting in civil aviation.
2. ECCAIRS (European Co-ordination Centre for Accident and Incident Reporting Systems) is a co-operative network of European Transport Authorities and Accident Investigation Bodies. The project is being managed by the Joint Research Centre of the European Commission.
3. All statistics are based on data available at the time of publishing

FACTS

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FORUM OF ANALYSIS PROVIDES A HOLISTIC VIEW OF FLIGHT SAFETY STATUS

According to both international and national regulatory framework people and operators in aviation are obliged to send an occurrence report to the Swedish Transport Agency when something happens that affects or potentially could affect flight safety or deviates from the norm. Last year the Swedish Transport Agency received almost 4,500 reports. In order to be able to effectively monitor trends and subsequently analyze them, a Forum of Analysis has been formed. The Forum of Analysis consists of representatives from each of the oversight areas within the Civil Aviation Department, such as aerodromes, air navigation services, security, flight operations and airworthiness, as well as Human Factors and Analysis competences.

The Forum of Analysis monitors, discusses and analyzes trends and deviations in the latest occurrence reporting, in particular within the department's Safety Performance Indicators. The base for trend monitoring and analysis is obtained from an alarm model. The outcome of the alarm model, trend monitoring, analysis and initiation of actions serves as a confirmation to the market that we have received and considered the occurrence reports, while it enhances the Swedish Transport Agency's flight safety efforts and safety culture.

One of the purposes of the Forum of Analysis is to provide a more holistic view on flight safety status and to identify which areas should be prioritized for the ongoing risk-based oversight in accordance with international and national regulatory framework. In short, the Forum of Analysis monitors the current flight safety status, something that both the aviation market and the Swedish Transport Agency are requesting.

The Forum of Analysis also initiates special actions designed to improve flight safety and the results of the analysis is reported back to the different units regularly. In addition, the results are presented to the industry annually in a flight safety report, together with proposals for actions. An example of an action already initiated by the Forum of Analysis is the seminar on airspace infringement that was held in the middle of June 2011. The Forum of Analysis is also contracted to help increase feedback to the market by the Swedish Transport Agency's website and through participation in various types of seminars for the market and the industry.

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ALARM MODEL FOR MONITORING SAFETY PERFORMANCE INDICATORS

In the guidelines of the Civil Aviation Department's trend oversight a number of issues concerning the systematic monitoring have been identified. The alarm model described below is the tool used for oversight of specific safety performance indicators within the department. In addition, the alarm model can be applied to other fields with reference to the occurrence reporting.

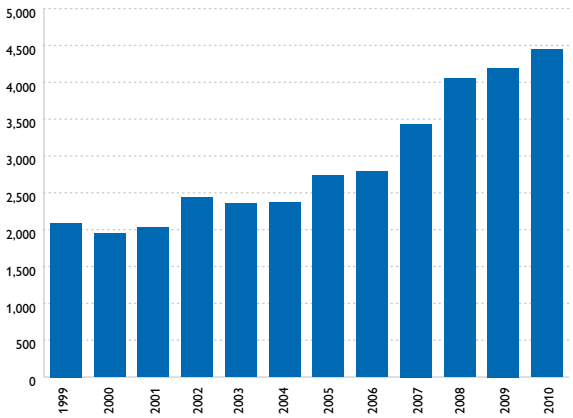
The Swedish Transport Agency has a responsibility to develop and administrate a suitable alarm model. The safety performance indicators initially monitored by the use of the alarm model are:

- Airspace infringements
- Runway incursions
- Accidents
- Occurrences
- Laser beams.

DATA

Figure 1 shows the development of the numbers of reported occurrences 1999 – 2010.

FIGURE 1 Number of reported occurrences



As shown, the number of reported occurrences has increased sharply, especially after 2006. From the middle of 2007 the occurrence reporting has been mandatory, which has had a considerable impact on the reporting. It can be assumed that there has been a significant under-reporting before 2007. Studying the development of the number of aircraft movements during the same period supports this assumption. The number of take-offs and landings decreased by 25 percent and the reported occurrences increased by 50 percent during the same period. If this relationship were correct, it would mean that the probability of an occurrence has increased substantially. This has been assessed as unlikely and the conclusion is that there has been a significant under-reporting. As a consequence, the information before 2008 is not useable since it underestimates the risk of an occurrence to happen.

CHOICE OF ALARM MODEL

Since we are dealing with randomness the alarm model needs to be firmly established in the probability theory. A feasible probability function for this case is the binomial distribution. The binomial distribution presupposes that each attempt (a take-off or a landing) is associated with a certain probability that an occurrence (e.g. a runway incursion) will happen. An important assumption is that the occurrences are independent (e.g. an incursion at Kiruna airport does not affect the probability of an incursion at Malmö airport). This implies that each flight has the same probability (p) of an occurrence to happen. It gives the answer to the question: What is the probability of x runway incursions with n aircraft movements? The probability function is:

$$p(x) = \binom{n}{x} p^x (1-p)^{n-x}$$

Where p is the probability of an occurrence to happen and $(1 - p)$ is the probability of an occurrence not to happen. With this, estimation can be made of how many occurrences one can expect at different volumes of aircraft movements. Various distribution measurements such as variance and standard deviation can now easily be calculated. These measurements are necessary when calculating confidence intervals. The idea is having the model alert when the actual outcome falls outside the confidence limits of the estimated values.

TO DETERMINE PROBABILITIES

The calculation of the probability for a certain occurrence is based on historical data from the occurrence reporting system ECCAIRS[1]. For reasons mentioned above only data from 2008 and forwards are used. By counting the number of a certain category of occurrence in relation to the number of aircraft movements during the same period one gets an estimation of the probability of an occurrence. As an example there were 278 runway incursions 2008 – 2010. During the same period there were 2.27 million take-offs and landings at the Swedish airports. That is a calculated frequency of 0.000122 (278/2.27 million). This means that we can expect one runway incursion in 8,200 aircraft movements. Regarding the estimation of the probability of an airspace infringement, we need to adjust for the seasonal variation. There are few airspace infringements during winter and more during the rest of the year. For example, the probability of an airspace infringement is more than five times higher in May compared to January. Thus, each month's unique probability is calculated.

FOLLOW-UP IN PRACTICE

Based on the probabilities, estimated values of the number of occurrences are calculated by multiplying the number of aircraft movements with the estimated frequencies. Similarly, confidence limits of the estimates are calculated. This is done when traffic statistics for the current month are compiled and the actual numbers thus are known. A confidence interval of 80 percent is used, meaning that we can be 80 percent confident that the true values are captured within the limits of the interval. Actual figures are extracted from the ECCAIRS system and compared with the confidence limits of the estimates. Airspace infringements for 2011 are shown in Figure 2. The black dots illustrate the actual number of airspace infringements. The blue triangles illustrate the estimated value and the red lines the confidence limits. As shown, the alarm model of airspace infringements alerted four times during the year. All the alarms indicated fewer occurrences than estimated.

Runway incursions were alerted three times. Two of these alarms indicated fewer occurrences and one indicated a higher number of occurrences than estimated (see Figure 3).

FIGURE 2 Airspace infringements, estimated value, actual value and confidence limits (80 %)

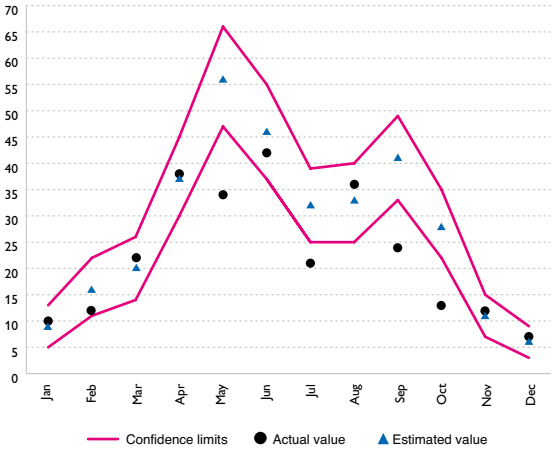
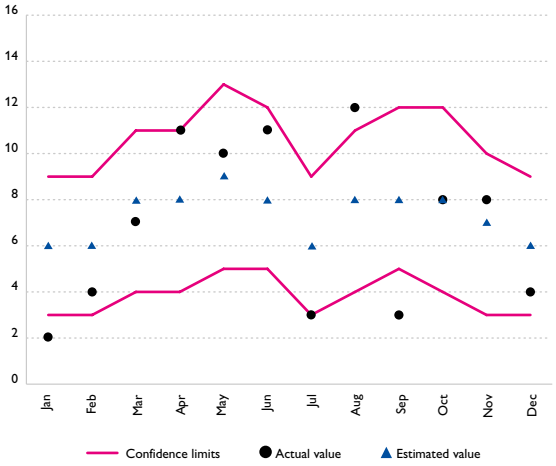


FIGURE 3 Runway incursions, estimated value, actual value and confidence limits (80 %)



Read more about the safety performance indicators for 2011 and 2012 in the article "Occurrence reporting in Sweden", page 15.

1. ECCAIRS (European Co-ordination Centre for Accident and Incident Reporting Systems) is a co-operative network of European Transport Authorities and Accident Investigation Bodies. The project is being managed by the Joint Research Centre of the European Commission.

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AIR TRAFFIC FORECASTS

Twice a year the Civil Aviation Department establishes air traffic forecasts for the coming six years, usually at the end of March and August, respectively.

WHY:

- To set the level of the Swedish Transport Agency's charges;
- To give the outside world the Swedish Transport Agency's assessment of the aviation traffic development over the next six years.

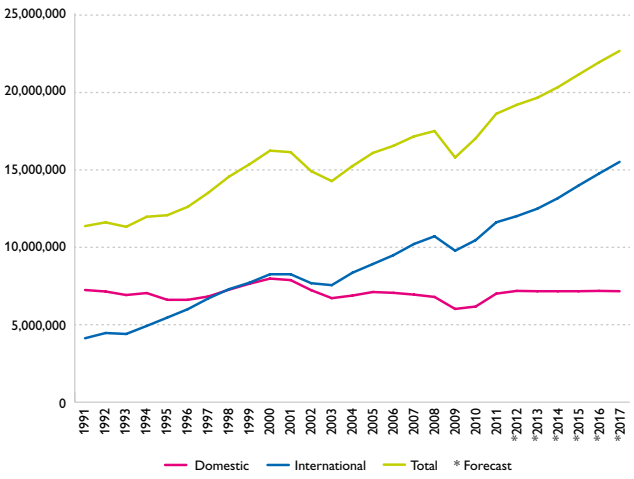
WHAT:

- Passenger forecast – Authority charges;
- Passenger forecast – Joint charging system for security equipment at the airports;
- Service units – Air navigation services charges;
- Terminal service units – Terminal navigation services charges.

HOW:

- An econometric demand model is used to forecast the number of passengers – significant positive correlation between demand for aviation journeys and economic development;
- Air traffic movements are derived from the passengers' forecast. Assumptions are made regarding for example aircraft fleets and load factors;
- Consultations with the aviation industry (airlines, ANS-providers and aerodrome operators) where information is retrieved are held regularly;
- Formal establishment of the forecasts by the Civil Aviation Director;
- Publication at www.transportstyrelsen.se. The ANS providers, for example, use the published traffic forecasts when they estimate their cost base of the unit rate for air navigation services. The costs are allocated according to regulation (EC) No 1794/2006 laying down a common charging scheme for air navigation services. The Transport Agency manages the charging scheme in Sweden.

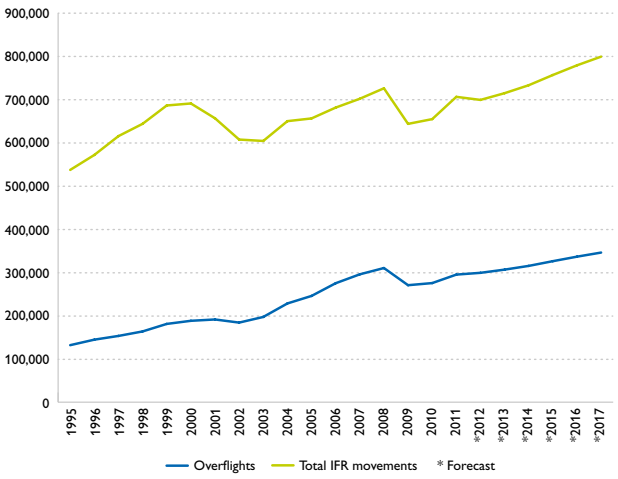
FIGURE 1 Departing passengers 1991 – 2011, forecast 2012 – 2017



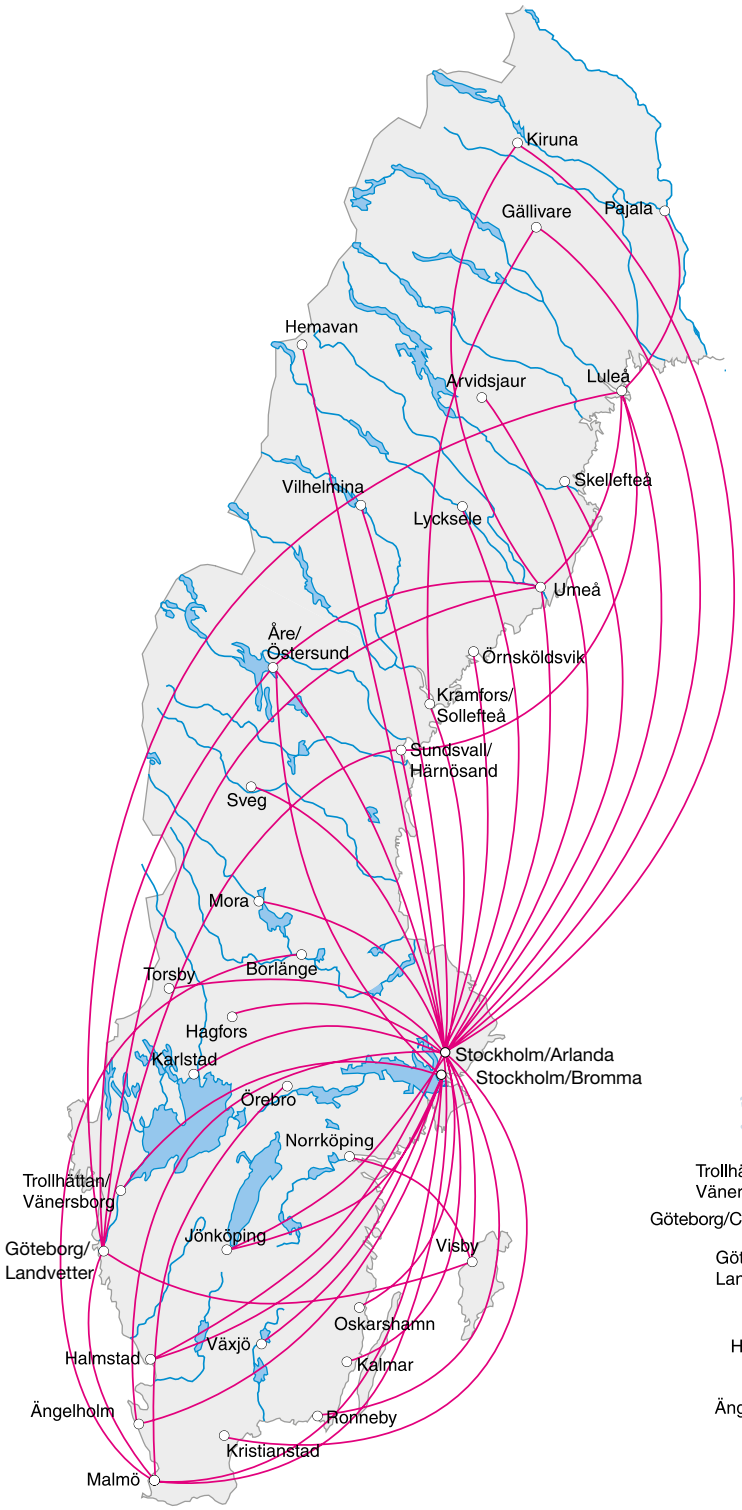
RESULTS:
The latest established forecast is from 31 August 2012. Figure 1 shows the forecast of departing passengers 2012–2017. The average annual growth of the total number of departing passengers is estimated to 3.3 percent.

Figure 2 shows the forecast of total IFR movements and overflights 2012 – 2017. The average annual growth of the total number of IFR movements is estimated at 2.1 percent.

FIGURE 2. Total IFR movements and overflights 1995 – 2011, forecast 2012 – 2017

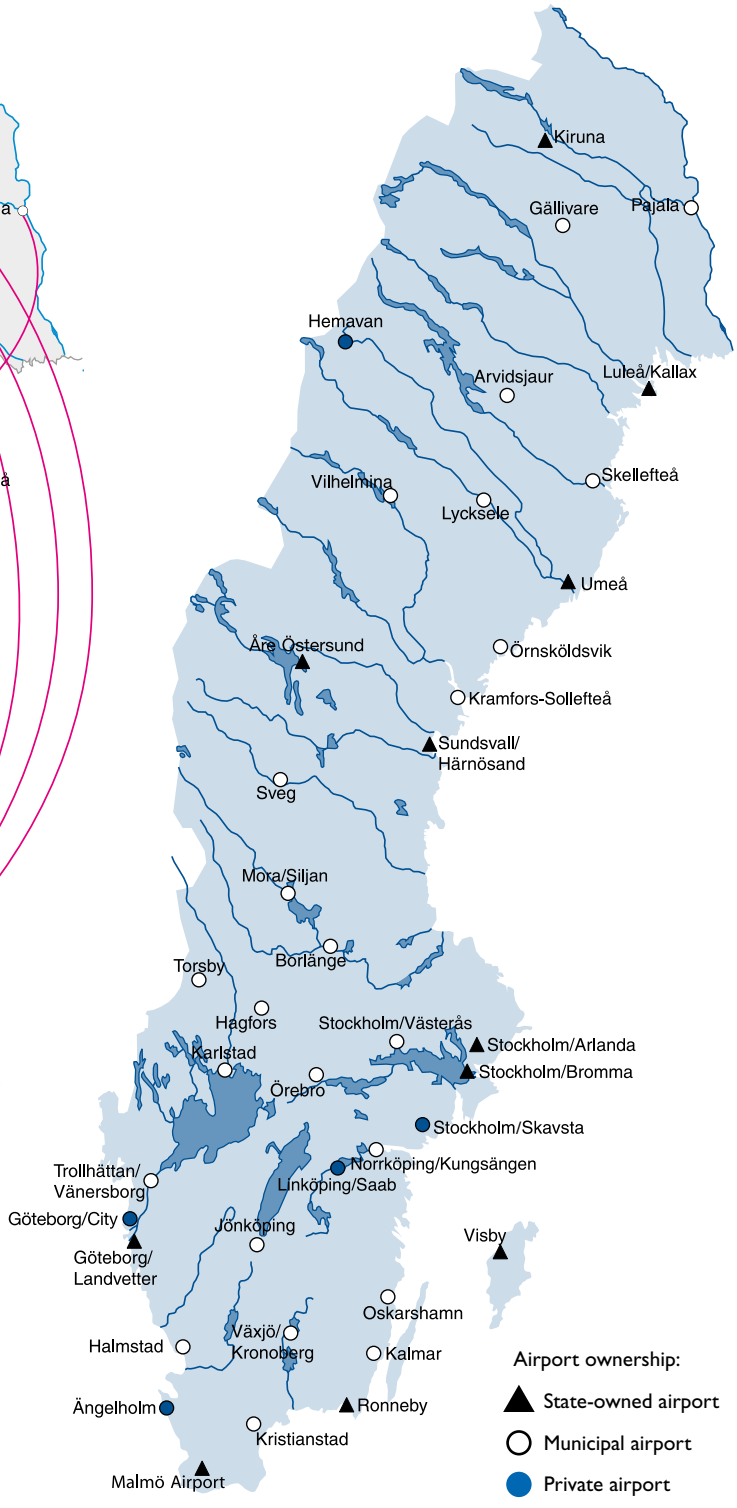


DOMESTIC NETWORK IN 2011



Source: Swedish Transport Administration

SWEDISH AIRPORTS IN 2011



Source: Swedish Transport Agency

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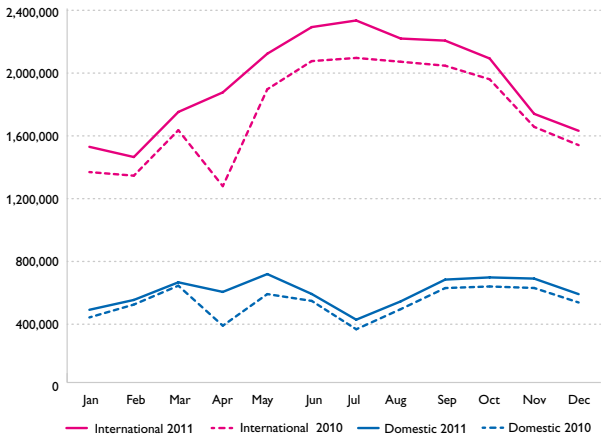
STATISTICS

TRAFFIC DEVELOPMENT 2011

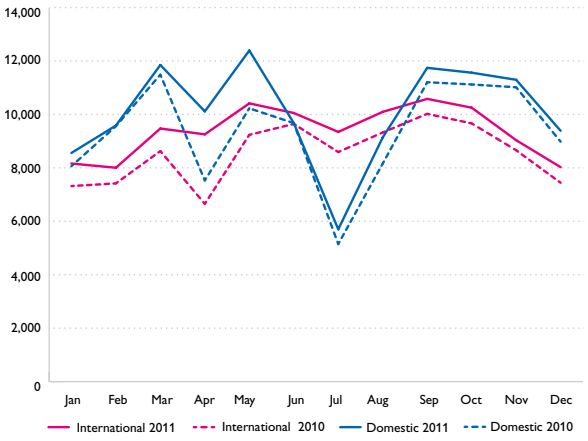
Number of arriving and departing passengers at Swedish airports with scheduled and non-scheduled traffic

Airport	2010	2011	Change	Change, %
Arvidsjaur	42,494	49,320	6,826	16.1%
Borlänge	33,811	36,375	2,564	7.6%
Gällivare	34,106	42,195	8,089	23.7%
Göteborg/City	714,798	772,669	57,871	8.1%
Göteborg/Landvetter	4,129,471	4,899,973	770,502	18.7%
Hagfors	3,392	2,917	-475	-14.0%
Halmstad	93,640	104,755	11,115	11.9%
Hemavan	10,733	12,099	1,366	12.7%
Jönköping	73,000	82,805	9,805	13.4%
Kalmar	166,461	176,877	10,416	6.3%
Karlstad	83,670	108,893	25,223	30.1%
Kiruna	199,146	164,142	-35,004	-17.6%
Kramfors/Sollefteå	21,634	21,714	80	0.4%
Kristianstad	38,394	39,347	953	2.5%
Linköping/Saab	91,521	103,150	11,629	12.7%
Luleå/Kallax	979,135	1,066,485	87,350	8.9%
Lycksele	21,460	24,822	3,362	15.7%
Malmö Airport	1,597,164	1,944,887	347,723	21.8%
Mora/Siljan	8,144	9,565	1,421	17.4%
Norrköping/Kungsängen	115,660	114,088	-1,572	-1.4%
Oskarshamn	11,742	12,706	964	8.2%
Pajala/Ylläs	2,651	3,333	682	25.7%
Ronneby	208,790	227,497	18,707	9.0%
Skellefteå	224,477	277,956	53,479	23.8%
Stockholm/Arlanda	16,948,129	19,056,143	2,108,014	12.4%
Stockholm/Bromma	2,037,388	2,181,064	143,676	7.1%
Stockholm/Skavsta	2,507,772	2,581,639	73,867	2.9%
Stockholm/Västerås	150,793	150,190	-603	-0.4%
Sundsvall/Härnösand	256,132	282,245	26,113	10.2%
Sveg	5,697	5,063	-634	-11.1%
Torsby	2,955	2,614	-341	-11.5%
Trollhättan/Vänersborg	39,603	43,488	3,885	9.8%
Umeå	846,083	956,046	109,963	13.0%
Vilhelmina	13,908	14,997	1,089	7.8%
Visby	308,119	340,599	32,480	10.5%
Växjö/Kronoberg	162,875	180,640	17,765	10.9%
Åre Östersund	356,093	377,795	21,702	6.1%
Ängelholm	376,234	396,757	20,523	5.5%
Örebro	68,517	82,904	14,387	21.0%
Örnsköldsvik	86,283	90,885	4,602	5.3%

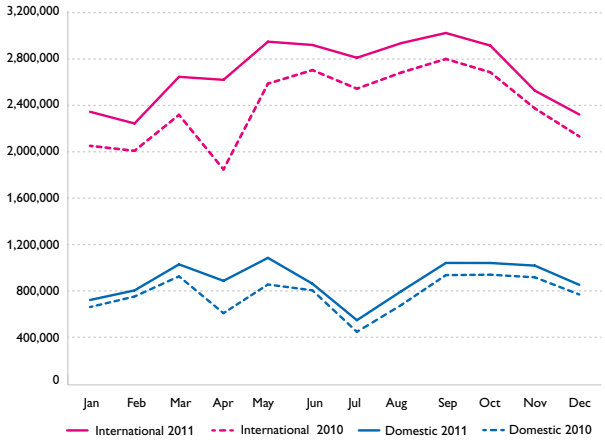
Number of scheduled and non-scheduled passengers at Swedish airports in 2010 and 2011



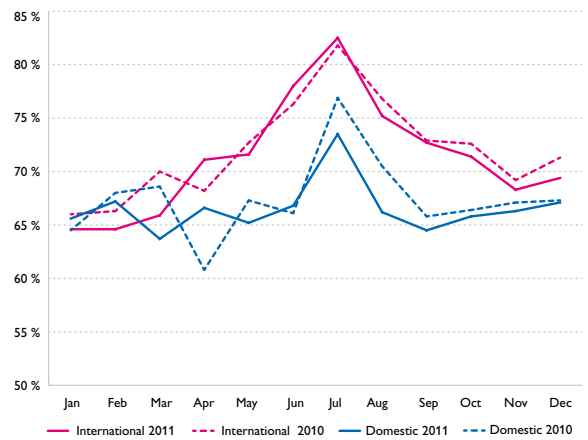
Number of scheduled and non-scheduled landings (only passenger flights) at Swedish airports in 2010 and 2011



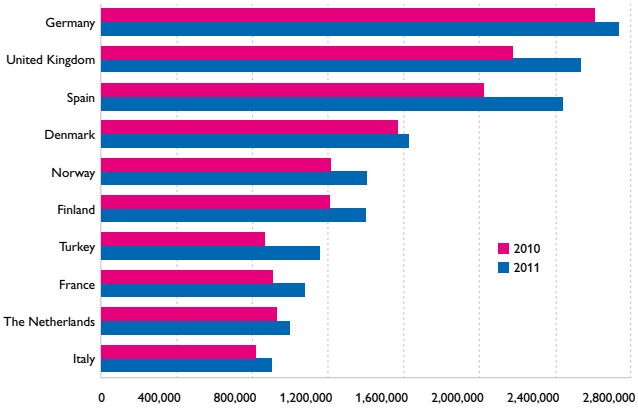
Number of available seats in scheduled and non-scheduled traffic at Swedish airports in 2010 and 2011



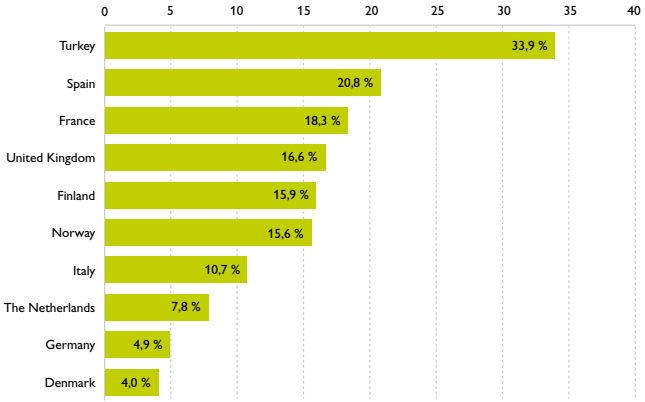
Development of passenger load factor in scheduled and non-scheduled traffic in 2010 and 2011



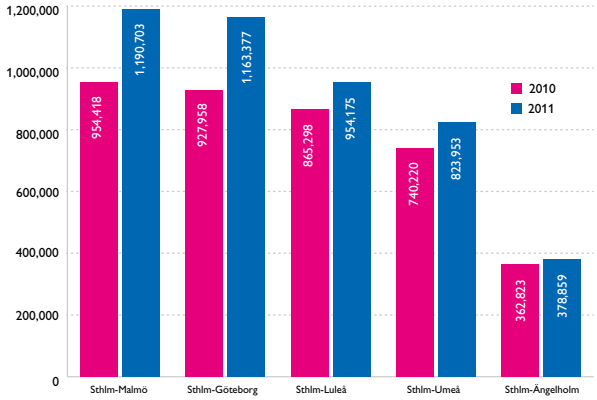
Number of arriving and departing passengers to/from the top ten countries (first destination) in 2010 and 2011



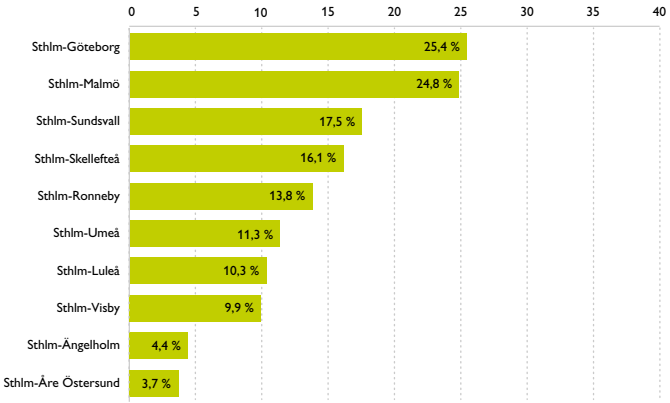
Relative change in the number of passengers travelling to/from the top ten countries during 2011



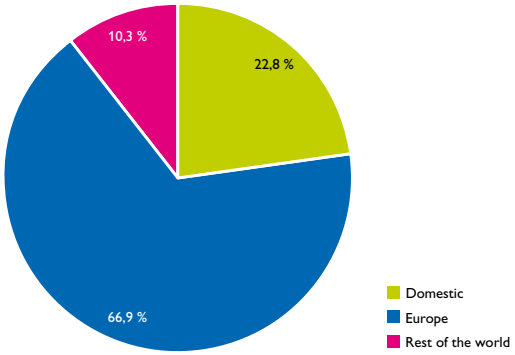
Number of passengers on the five major domestic routes in 2010 and 2011



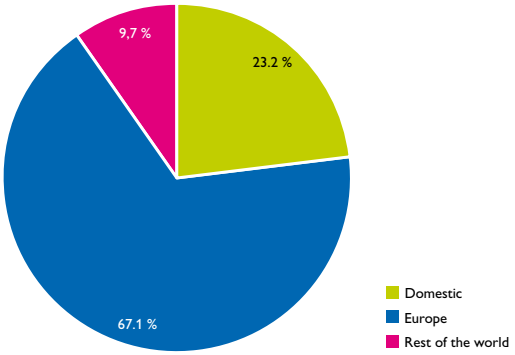
Relative change in the number of passengers at the ten major domestic city-pairs during 2011



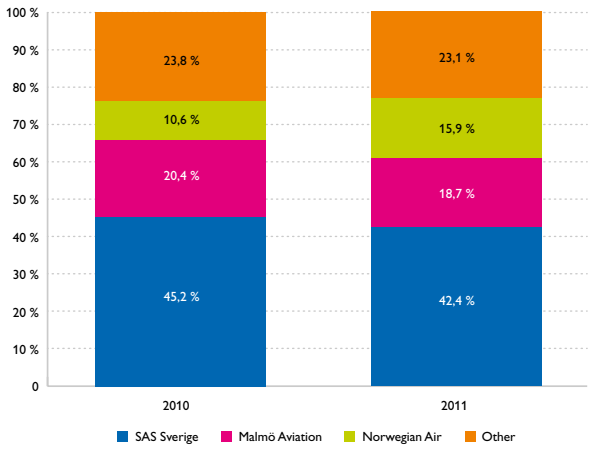
Passengers divided by region during 2010 (first destination)



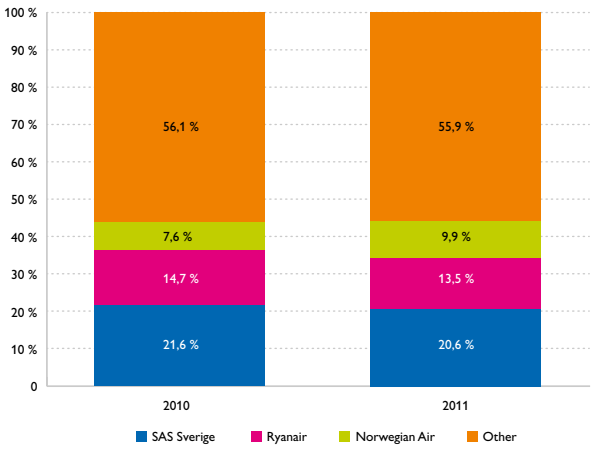
Passengers divided by region during 2011 (first destination)



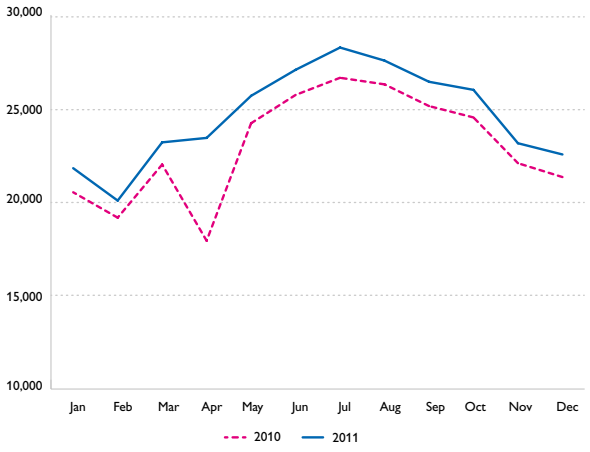
Market share in domestic traffic



Market share in international traffic



Number of overflights in controlled airspace in 2010 and 2011



CIVIL AVIATION DEPARTMENT – FACTS 2011

PERSONNEL

Average number of employees	228
of which	
Inspectors/examiners	113
Administrative	21
Legal/experts	37
Registration	21
Analysts	8
Management	21
Controllers/Quality	3
IT	4

VALID PERMITS PER TYPE

Type of permit	**Number**
Operating license	41
Flight operational approval	86
Training permit	80
Maintenance workshop	184
Airworthiness	1,676
Security	149
Aerodrome	79
ANS permit	89
Personnel license	14,323
Registered aircraft	3,089
Total	**19,796**

NUMBER OF CASES PER TYPE

	Number
Personnel licenses	18,569
Security personnel checks	8,570
Aircraft registry	586
Total	**27,725**

AUDIT/INSPECTION VOLUME

Activity	**Audits/inspections**	**Remarks**
Flight operations	119	529
Aerodrome	32	408
Air Navigation Services	25	179
Security	184	236
Aircraft	1,676	
ACAM (Aircraft Continuing Airworthiness Monitoring)	57	
Airworthiness organisations	219	1,312
Aviation schools	28	93
Total (excluding foreign AOC holders)	**2,340**	**2,757**
Flight operations (foreign AOC holders)	63	
Total (including foreign AOC holders)	**2,403**	

TURNOVER AND FINANCING

Revenue (thousands SEK)	
Direct fees and authority charges	287,803
Other sources	131,366
Total	**419,169**
Costs (thousands SEK)	
Personnel	168,573
Membership fees	97,446
Other	**98,937**
Total	**364,956**
Result	**54,213**

VALID PERSONNEL LICENSES PER CATEGORY[1]

Category	**2007**	**2008**	**2009**	**2010**	**2011**
CPL (A) and ATPL (A)	3,555	3,542	3,495	3,457	3,446
CPL (H) and ATPL (H)	411	365	374	381	435
Air Traffic Controllers	724	727	754	787	780
Aircraft technicians/mechanics	1,549	1,502	1,517	1,538	1,525
PPL (A)	4,305	4,180	4,091	3,900	3,721
PPL (H)	189	186	188	207	224
Glider licenses	1,768	1,661	1,578	1,534	1,524
Microlight licenses	729	691	716	721	782
Total	**13,230**	**12,854**	**12,713**	**12,525**	**12,437**

1 Student permits and some other minor categories not included.

Anfang Reklambyrå

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