

Helsinki-Vantaa Airport
ENVIRONMENTAL REPORT 2006
English summary

Environment year 2006

Runway 2 was closed for renovation of the apron area for four months. The renovation resulted in a temporary increase in noise in some areas around the airport.

A contaminated site between runways 1 and 3 was restored in autumn 2006.

The year 2006 saw the continuation of a project aimed to launch the use of a centralised aircraft de-icing area constructed in connection with runway 3 in autumn 2007 and transfer the bulk of aircraft de-icing treatment to this area.

Effects of air and land vehicle traffic on air nitrogen dioxide levels was studied using the passive sampler method at 21 sites around the airport area for a period of three months in the autumn.

Of the environmental objectives set for 2006, formulation of the application for the airport environmental permit and the planning of the launch of the centralised de-icing area and the formulation of the related environmental assessments will be continued in 2007. The development of the water treatment arrangements for runway 3 will also continue. The application for an environmental permit for the airport heat generation plant was submitted to the environmental permit authority in spring 2006. Short-term aircraft noise measurements took place in two residential areas, Voutila and Ylästö, instead of the planned three. Local residents were informed of the impacts of the closedown of runway 2 on air traffic and aircraft noise through the press and on the Finavia's web-site.

Traffic

During 2006, there were 176,000 air transport operations at Helsinki-Vantaa Airport, which is about 5.3 per cent more than in the previous year. Passenger numbers rose by 9 per cent to 12.1 million.

Aircraft take off and land against the wind

Helsinki-Vantaa Airport has three runways, which are used in accordance with weather conditions and traffic situation. It is safest for aircraft to take off and land against the wind. Aside from air safety aspects, aircraft noise management also affects the choice of runway.

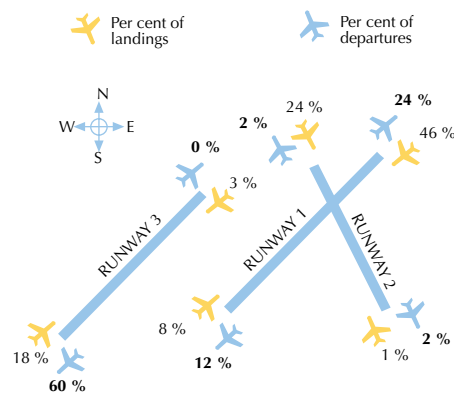
Choice of take-off and landing direction in which least people live helps to minimise the number of residents in noise areas (L_{DEN} 55 dB). Under the so-called preferential principle, runway 2 is primarily used for landings from the northwest and runway 3 to the southwest for take-offs.

The closedown of runway 2 due to apron renovations increased landings on runway 1 from the northeast and runway 3 from the southwest. The closedown did not have much effect on take-offs. The primary landing direction – runway 2 from the northwest – was used for 24 per cent of landings during the year, and for around 32 per cent of nighttime landings between 22.00 and 07.00. Outside the renovation period a total of 51 per cent of night landings took place on runway 2 from the northwest. The primary take-off direction – runway 3 to the southwest was used for around 60 per cent of take-offs and 72 per cent of night take-offs.

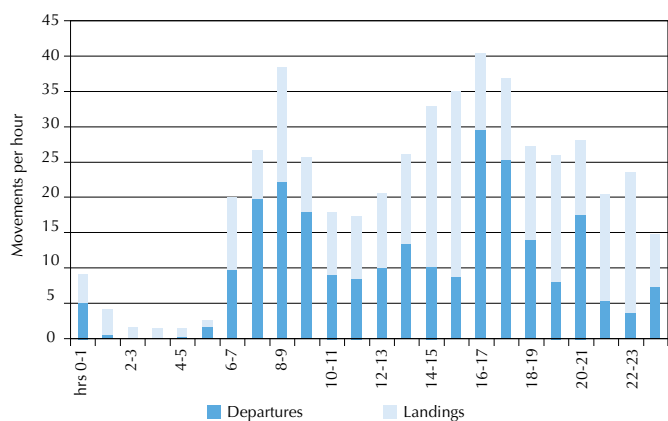
TRENDS IN AIR TRANSPORT MOVEMENTS AND PASSENGERS



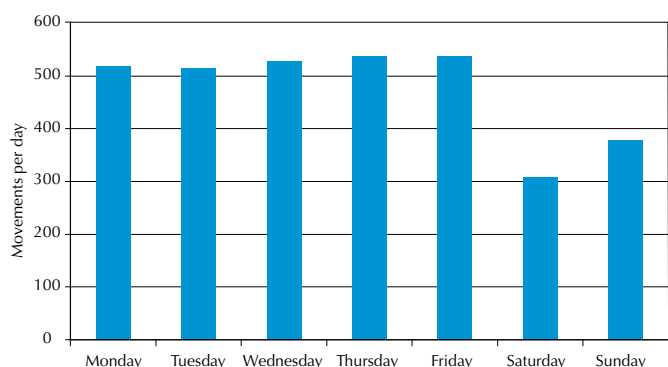
RUNWAY USE



DIVISION OF TRAFFIC ACCORDING TO THE HOUR



DIVISION OF TRAFFIC ACCORDING TO THE DAY OF THE WEEK



Noise

Runway 2 closed for the summer

Runway 2 was closed for renovation of the apron area. The renovation resulted in a temporary increase in noise in the Maantiekylä area of Tuusula, northeastern Vantaa, Kerava, western Vantaa and central Espoo. There was a temporary decrease in noise in Nurmijärvi and western Tuusula. Local residents were informed about the impacts of the renovation on aircraft noise in the press and on the Finavia website.

Renovation periods could be seen in aircraft noise calculations

Aircraft noise calculations for 2005 and 2006 took place using a new calculation method that yields results that are not fully comparable in every detail with the method used before. The method meets new international recommendations and extends the computational noise area sideways along the flight routes.

In 2005 runway 1 remained closed for around six months and in 2006 runway 2 was out of service for four and a half months. Noise calculations made show how runway shutdowns affect the shape of noise areas and therefore the number of residents in the computational noise area. The number of residents in the aircraft noise area was around 5,000 in 2005 and 10,200 in 2006. In 2006 the noise area was 54 km², which is 4 km² smaller than in 2005.

Changes in aircraft have reduced take-off noise, so the division of landings between runways has increased in significance regarding noise area shape and the number of residents affected. A review of jet engine aircraft taking off southwest on runway 3 could be seen in the noise area calculations for 2005 and 2006 in that the noise area does not cover the Kivistö area as extensively as it used to.

Slight increase in the share of quieter aircraft

The most significant way in which airline companies can reduce aircraft noise is to upgrade their aircraft fleet. The aircraft fleet continued to undergo changes in 2006: Airbus 320 aircraft, Embraer 170 and 190 aircraft accounted for 58 per cent of operations, up from 50 per cent. Their take-off noise is considerably lower than that of aircraft including those in the MD80 series. MD80 aircraft accounted for 4 per cent of operations, down from 10 per cent. Some 29 per cent of traffic was operated using low noise turboprop aircraft.

Aircraft noise

Helsinki-Vantaa Airport manages aircraft noise primarily by preferential use of runways, planning flight routes to skirt residential areas as far as possible, and by working in cooperation with the planning authorities.

Water and soil

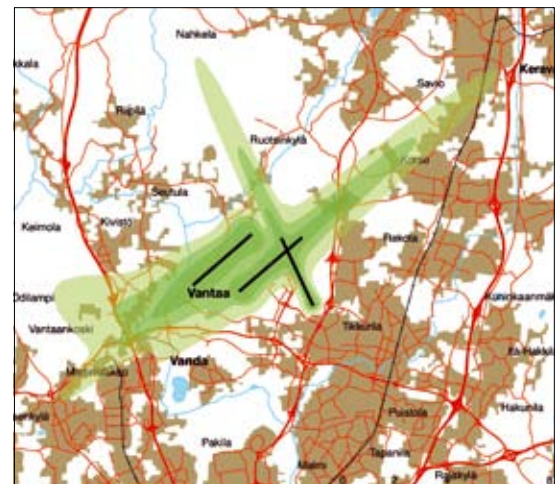
Ice prevention and de-icing

To ensure safe manouverability of the aircraft ground handling companies wash the aircraft with a solution of hot water and propylene glycol before take-off. Propylene glycol is not classified as a hazardous substance, but if let into waterways it consumes oxygen and emits an unpleasant odour when decomposing.

NOISE CONTOUR DEVELOPMENT AND FORECASTS, L_{DEN}55 dB

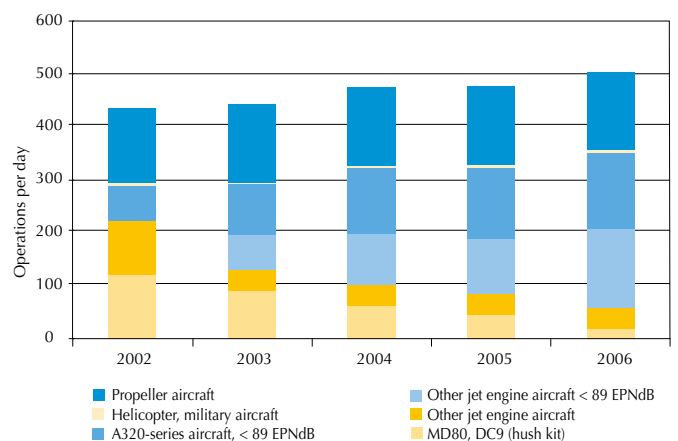
Year	Area km ²	Inhabitants
1990	165	97 000
1992	130	60 000
1998	135	45 000
2000	85	15 000
2003	56	9 000
2004	58	11 000
2005	58	5 000
2006	54	10 200
2010	65	8 000 forecast

AIRCRAFT NOISE AREA 2006

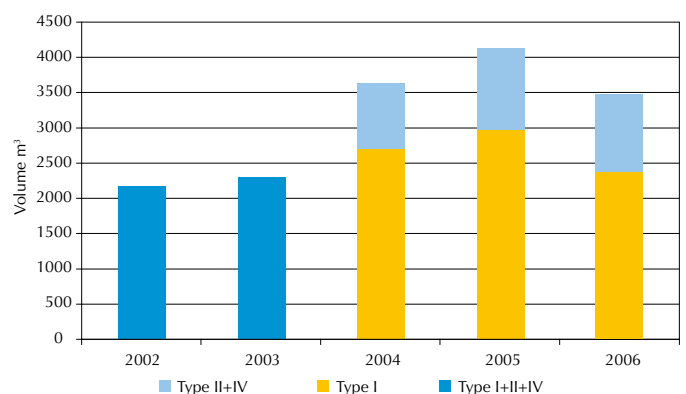


L_{DEN} > 65 dB 60-65 dB 55-60 dB 50-55 dB
L_{den} Day-evening-night sound level with evening noise level (7pm-10pm) weighted by + 5 dB and night time (10pm-7am) level weighted by + 10 dB.

OPERATIONS PER AIRCRAFT TYPE



YEARLY USE OF AIRCRAFT DE-ICING AGENTS



For environmental reasons, the airport has designated areas where de-icing treatment is permitted, most of which are provided with drains connected to the wastewater sewer system. In other areas, suction sweepers collect the de-icing fluid.

In summer 2006 an aircraft stand with drains connected to the wastewater system was constructed for apron 2, allowing the treatment of one wide-body aircraft or two smaller aircraft at a time. Ice prevention and de-icing activity will be developed further and the objective for 2007 is to adopt a centralised de-icing area in connection with runway 3.

The de-icing fluid collected will be taken to a wastewater treatment or digestion plant. Snow containing de-icing fluid is collected separately from the apron area and taken to two dumps, where the melt water is conducted into the wastewater drainage system.

The consumption of anti-skid chemicals varies according to weather conditions

Adequate friction is required on runways for aircraft to be able to take off and land safely. To ensure this, anti-skid chemicals are spread on the runways to melt the ice and to prevent it from reforming after mechanical treatment. These chemicals are not classified as hazardous substances, but consume oxygen if they pass into a waterway. Anti-skid fluids consist of about 50 per cent water.

The use of liquid anti-skid fluids increased by approximately 30 per cent during 2006, and the use of granular anti-skid fluids decreased by approximately 27 per cent. Weather conditions were the factor with the greatest impact on consumption. The changes in consumption were also due to increased use of runway 3 and the introduction of a new chemical: liquid potassium formiate.

The impacts of ice prevention and anti-skid chemicals are monitored through regular sampling. Samples are taken from surface and groundwater to examine issues such as chemical oxygen consumption, nitrogen compounds and oxygen levels.

Efficiency of the water treatment system monitored

Runoff water containing anti-skid substances from runway 3 is absorbed into specially built underground rock embankments. The efficiency of the embankments is monitored in accordance with the programme accepted by the Uusimaa regional Environment Centre. Based on observations from winter 2005/2006, the soil treatment of runoff water decreased the biological load by over 80 per cent.

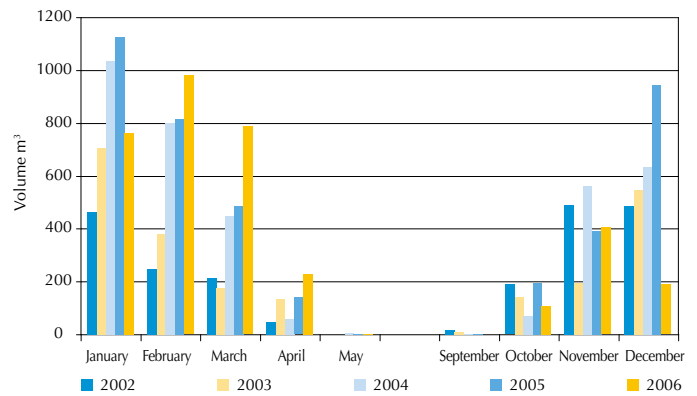
Groundwater intake remains unchanged

Drinking water for the entire airport area is extracted from the airport's own groundwater intake plant. In 2006, some 277,000 cubic metres were extracted, of which around 104,000 cubic metres went for airport use and the remainder for companies operating at the airport.

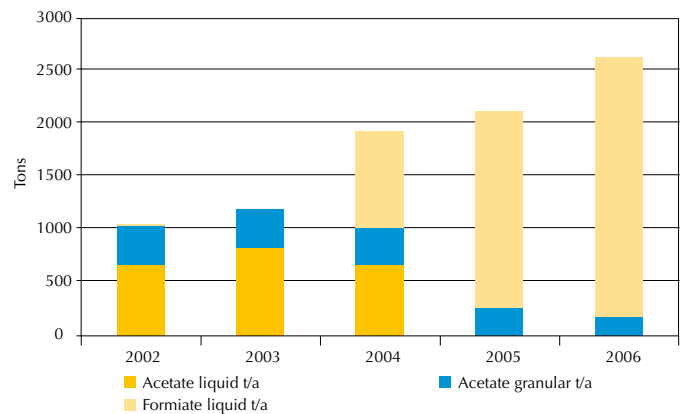
Contaminated area restored

The airport has a fire practice area between runways 1 and 3 where various fire incidents are simulated and practices carried out in the event they become reality. Apart from the airport rescue service, Avia College and Finnair trainees also practice in the area. During 2006, 13 fire practices were held in which 4,500 litres of fuel oil

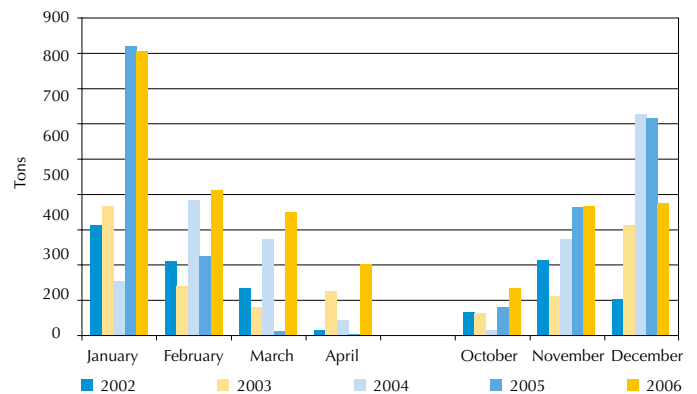
MONTHLY USE OF AIRCRAFT DE-ICING AGENTS



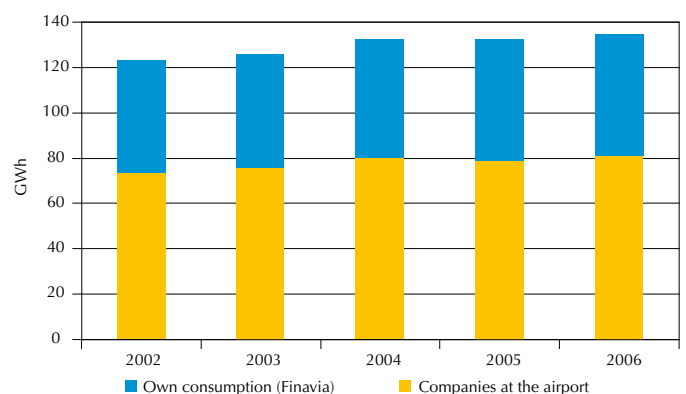
YEARLY USE OF RUNWAY DE-ICING AGENTS



MONTHLY USE OF RUNWAY DE-ICING AGENTS



ELECTRICITY CONSUMPTION AT THE AIRPORT



and some wood and straw were used. Extinguishing powder, film-forming foam and water were used as extinguishing agents.

In July 2006 it was detected that there had been an oil discharge from the oil separation unit of the fire practice area into the outfall ditch. The ditch base was repaired in the autumn by removing contaminated soil over a length of approximately 600 metres. This work was hindered by peaty soil as well as heavy rainfall experienced in the autumn.

Energy, air and waste

Heat generation plant included in the CO₂ emissions trading scheme

Heat consumption throughout the entire airport area in 2006 was 107 GWh, of which only 4.4 GWh was generated by the airport and the remainder bought from Vantaa Energy. The airport accounted for 24 per cent of all heat consumption and companies operating at the airport for the rest. The airport heat generation plant is included in the carbon dioxide emissions trading scheme (above 20mW capacity). In 2006 CO₂ emissions amounted to around 1,500 tonnes.

Electricity consumption at the airport was 132 GWh, of which 39 per cent was used by the airport and 61 per cent by companies operating at the airport.

Changes in amounts of air emissions

Airborne emissions in the airport area are caused by air traffic, vehicles heading for the airport, vehicular traffic in the airport area and the airport's own heat generation plant.

Aircraft emissions are calculated from an internationally defined landing and take-off cycle (LTO cycle). Calculations include emissions from take-off, landing and associated taxiing, up to a height of 3000 feet (approx. 900 m). This means emissions in the take-off direction for a distance of approximately 6 kilometres and approximately 18 kilometres in the landing direction.

Carbon monoxide emissions during the LTO cycle rose by approximately 4 per cent and carbon dioxide emissions by 2 per cent. The growth was due to issues such as new engine technologies which decrease nitrous oxide emissions but increase carbon monoxide and carbon hydrogen emissions.

Emissions from the Administration's ground traffic were calculated on the basis of fuel consumption figures and vehicle data. Ground traffic includes vehicles used in winter maintenance, apron control, repair and servicing work. Compared to 2005, ground vehicle fuel consumption decreased by approximately 4 per cent, and so did carbon dioxide emissions. Carbon monoxide emissions rose by 1 per cent whereas nitrous oxide and particle emissions dropped by 2 to 6 per cent.

Air quality was measured in the airport area

Nitrogen dioxide levels were studied using the passive sampler method over a period of three months in the autumn. Samplers

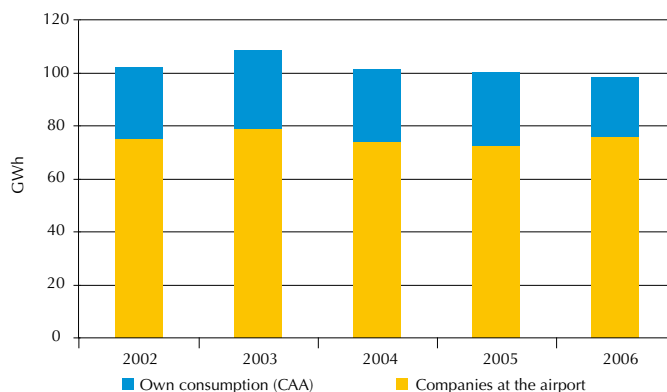
were placed at 21 sites around the airport area. Busy vehicle and land equipment traffic can be seen in the measurements both in front of and behind terminal buildings, particularly in spots with poor airflow while runways and taxiways enjoy high airflow and do not have standing motorised land equipment or vehicles with engines running, so levels found are clearly lower.

Passive sampler measurements are indicative and supplement the continuous air quality measurements of levels of NO, NO₂, benzene and PM₁₀ particles that was started by the Helsinki Metropolitan Area Council (YTV) in late 2006 and is to be continued throughout 2007.

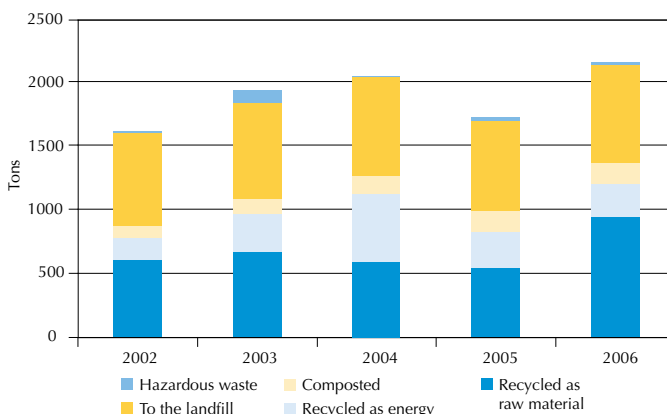
Increase in building waste increased the total amount of waste

In 2006, the amount of waste rose by some 25 per cent. This was largely owing to an increase in building waste, metal scrap and mixed waste. The amount of scrap metal almost tripled from the year before. The amount of waste that can be reused as raw material increased due to reuse of building waste. The amount of mixed non-building waste collected increased by around 10 per cent, which was mainly due to the discontinuation of further sorting of packaging waste. The amounts of recyclable paper, combustible waste fraction and glass decreased slightly while the amount of bio-waste remained unchanged and that of cardboard increased by 10 per cent.

HEAT CONSUMPTION AT THE AIRPORT



THE TOTAL AMOUNT OF WASTES



EMISSIONS TO AIR 2006 (t/a)

	CO	HC	NO _x	PM	SO ₂	CO ₂
Air traffic	790	80	570		50	161 400
CAA ground traffic	14	4,1	21	1,2	0,03	2770
Heat power plant			3,0	1,8	2,2	1540

PM = particles

Communication

Contacts by residents

Helsinki-Vantaa Airport answers enquiries about environmental issues by telephone, email or letter. All contacts are registered and the amounts are reported quarterly to the environmental authorities. In 2006, a total of 377 people contacted the airport. Almost all queries were to do with aircraft noise.

Regional cooperation led by the Uusimaa Regional Council

Finavia cooperates with the environmental and planning authorities of neighbouring municipalities through a regional aircraft noise monitoring committee led by the Uusimaa Regional Council. The monitoring group enables the exchange of information about current issues between the municipalities and Finavia. In 2006 the monitoring group had two meetings.

Environmental objectives for 2007

- Participating in the formulation of the airport's environmental permit.
- Participating in the planning and implementation of the launch of the centralised de-icing area and the related environmental assessments.
- Improving water treatment in runway 3 embankment pools by increasing water oxidation.
- Building a new collection pool for highly concentrated glycol water to replace the old pool that will be taken out of use.
- Informing local residents about noise impact caused by runway renovation.
- Improving the handling of contacts made by the public through measures including increases in resources and introducing an online service form to replace email queries.

Following environmental report

The following environmental report will be published in June 2008 and will examine the factors affecting environmental impact at Helsinki-Vantaa Airport and the achievement of environmental objectives for 2007.

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