TRAFICOM
Finnish Transport and Communications Agency

# Finnish Aviation Safety Review 2024

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# 1 Commercial air transport safety situation 2024

**The year 2024 was a safe one overall for Finnish commercial air transport. However, two exceptional accidents occurred during the year, both of which involved passengers being injured while descending the stairs of an aircraft. The number of serious incidents increased significantly compared to previous years. In many cases, these were again near misses with drones.**

Finnish commercial air transport traffic continued to grow compared to the previous year. However, compared to 2019, the year before the coronavirus pandemic, traffic volumes were still approximately 10% lower. The volume of all commercial air transport (both Finnish and foreign) at Finnish airports continued to grow by approximately 7% compared to the previous year. However, compared to 2019, traffic volumes were approximately 24% lower.

In 2024, Finnish commercial air transport operations were still significantly affected by the war in Ukraine, as they were in 2022 and 2023. The avoidance of conflict areas and the closure of Russian airspace to European operators caused significant changes to flight routes.

The disruption of satellite navigation systems, which began in 2022, continued, and its effects were also visible in Finnish airspace. In the autumn, Traficom published a website *Satellite navigation service interference in Finland*, which discusses the situation in more detail. The European Aviation Safety Agency (EASA) updated its information on the subject .

As assessed by level 2 indicators (the most typical causal factors for accidents), the number of near-misses in the air abroad continued to increase.

Globally, there were 13 fatal accidents in commercial air transport (aircraft with a capacity of 14 or more passengers) in 2024, killing a total of 306 people. This was above the five-year average of 12 fatal accidents and 212 deaths. The most serious accidents of the year occurred in Brazil in August, when an ATR 72 crashed, and in South Korea in December, when a Boeing 737-800 skidded off the runway. These accidents killed a total of 241 people.

Source: **Aviation Safety Network.**

## 1.1 Accidents

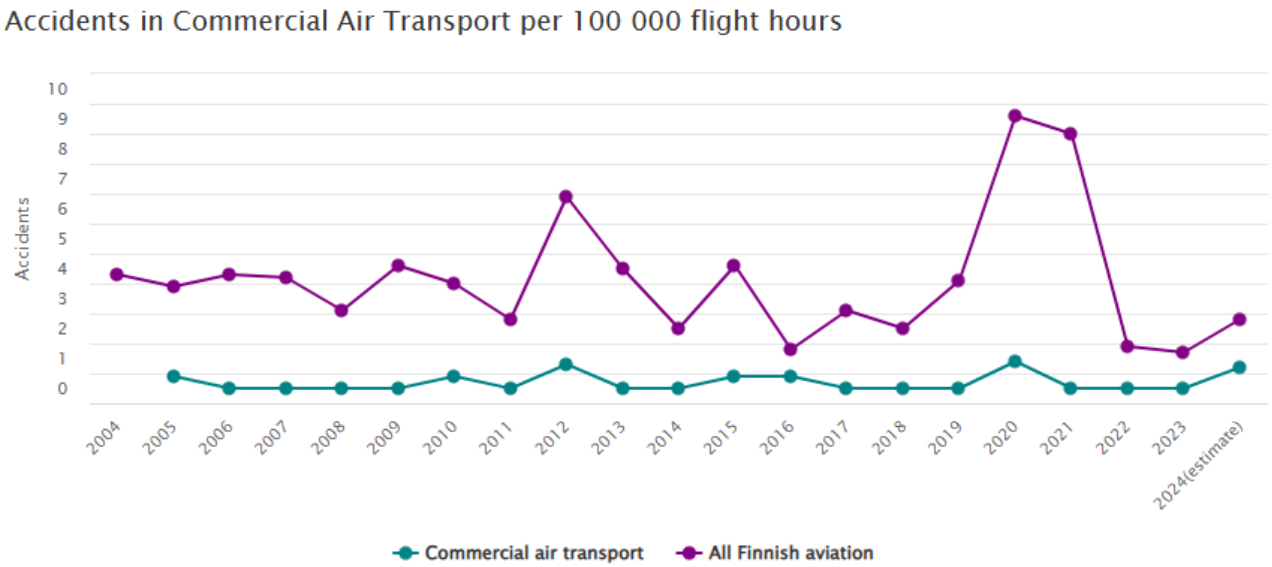
In 2024, two accidents occurred in Finnish commercial air transport, which were almost identical. In both cases, a passenger on an ATR 72 commercial aircraft was exiting the aircraft via a set of retractable stairs when the retractable part of the stair railing unexpectedly failed. As a result, the passenger fell onto the apron and received injuries that required hospital treatment. The first accident occurred at Jyväskylä Airport on 12 January 2024, and the second occurred at Helsinki-Vantaa Airport on 12 November 2024.

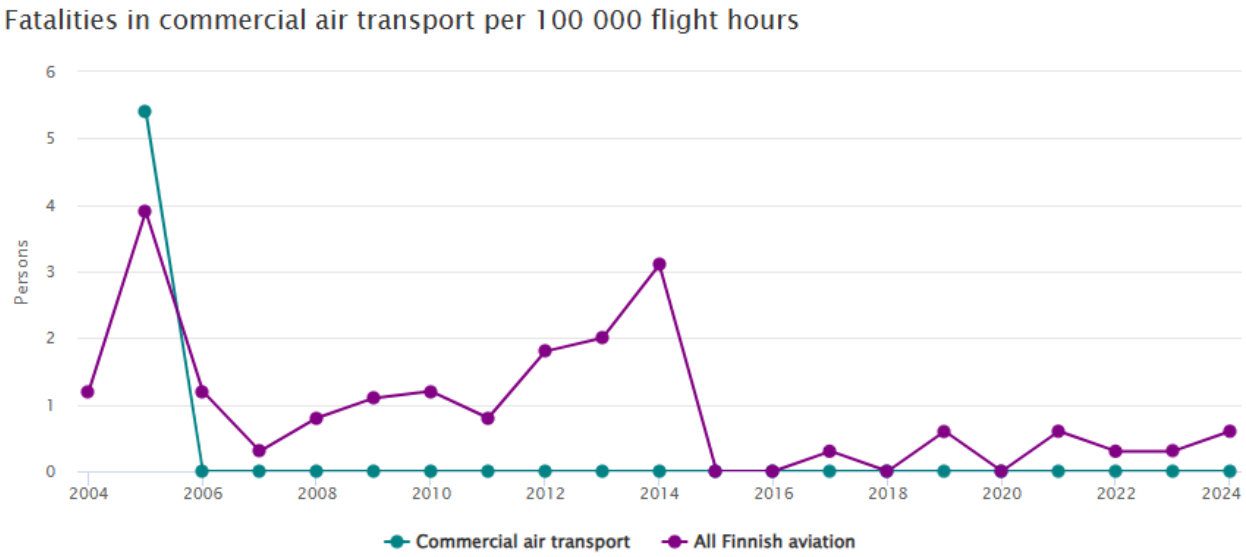
The Jyväskylä accident was investigated by the Finnish Safety Investigation Authority (OTKES), and the investigation report was published on 18 April 2024. It is available on the OTKES website . According to the investigation, a cabin crew member had failed to check that the pin locking the stair railing in the up position was correctly attached when opening the rear door. The investigation made several recommendations to the aircraft manufacturer and operators to prevent similar accidents. Although the operator implemented the recommendations, a similar incident later occurred in Helsinki. OTKES launched a full safety investigation L2024-03 into the accident at Helsinki Airport, which is still ongoing.

Accidents are extremely rare in Finnish commercial air transport. The previous accident occurred in 2020 when a cabin crew member was entering an aircraft from the upper deck of a stair car. However, the stair car started moving, causing the member to lose balance and fall from a height of approximately 3.5 meters, leading into serious injuries.
OTKES investigated this incident ( investigation L2020-01 ). The previous accident in scheduled Finnish passenger services occurred in 2005 ( Copterline accident ), and the most recent incident in other commercial air transport occurred when the landing gear of a cargo aircraft failed in Oulu in October 2016.

In 2024, there was also a fatal accident in ground handling operations during the transfer of an aircraft. Since the aircraft was not being used for aviation operations in this situation, the incident was recorded as an occupational accident and not an aviation accident. This incident is described in more detail in section 3.3 on ground handling operations.

Accident statistics are made proportional by relating incidents to the number of aircraft flight hours. In 2023, approximately 275,000 flight hours were accumulated in commercial air transport. Flight hour statistics for 2024 will be collected in spring 2025, but according to a preliminary estimate, flight hours increased by approximately 8% compared to the previous year, which would mean approximately 290,000 flight hours. Based on this, the accident frequency in 2024 was estimated to be 0.7 accidents per 100,000 flight hours, while the average for 2014–2023 was approximately 0.2 accidents per 100,000 flight hours.






**You can view accident statistics from 2005 onwards in an interactive, updated report on the tieto.traficom website .**

**List of accidents in 2024 (incl. foreign aircraft in Finland)**

1. January 2024: A passenger was exiting the cabin of a commercial aircraft when the handrail on the plane's fixed, retractable stairs gave way. The passenger fell down the stairs and was seriously injured.

2. November 2024: A passenger was exiting the cabin of a commercial aircraft when the handrail on the plane's fixed retractable stairs gave way. The passenger fell onto the apron and was seriously injured.

## 1.2 Serious incidents

In 2024, 14 serious incidents occurred in Finnish commercial air transport. The number was approximately double the average for 2014–2023.

Most of the serious incidents were related to near-misses between two aircraft in the air, half of which involved a drone. Near-misses have also accounted for the majority of serious incidents in previous years. Almost all incidents occurred abroad, except for the incident in Muhos on 20 July 2024, when a medical helicopter had to make an emergency avoidance maneuver to avoid a collision with a small aircraft.

The Finnish Safety Investigation Authorirty (OTKES) conducted a report on the incident, which can be read on the OTKES website . The situation occurred in uncontrolled airspace, where avoiding collisions is the responsibility of the pilots. The collision warning system used in the medical helicopter requires that the other aircraft has a transponder turned on. This was not the case in this case. The pilot of the other aircraft has not been reached.

Compared to previous years, the number of serious incidents also increased by five technical failures, which were classified as serious incidents. In two cases, smoke was observed in the aircraft, which led to the flight being aborted and passengers being evacuated. The number of technical failures classified as serious incidents was slightly above the longer-term average. The situation of various technical failures is discussed in more detail in the section on loss of control of the aircraft .

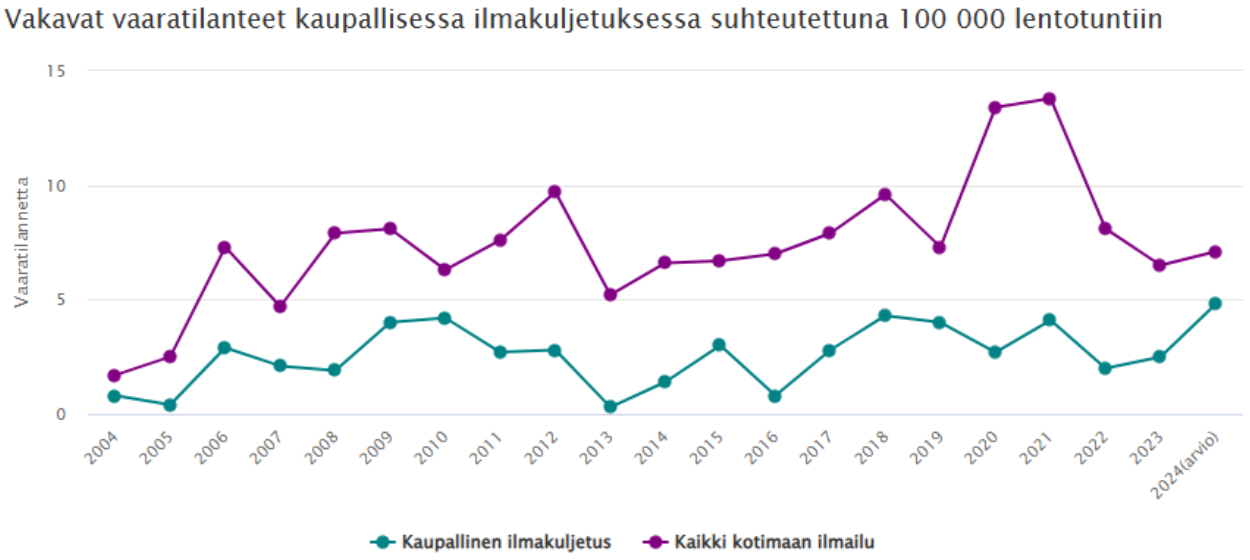
In 2024, there was also one reported incident where a small commercial aircraft encountered severe turbulence, resulting in one passenger being injured. A similar incident occurred with a small commercial aircraft the previous year.

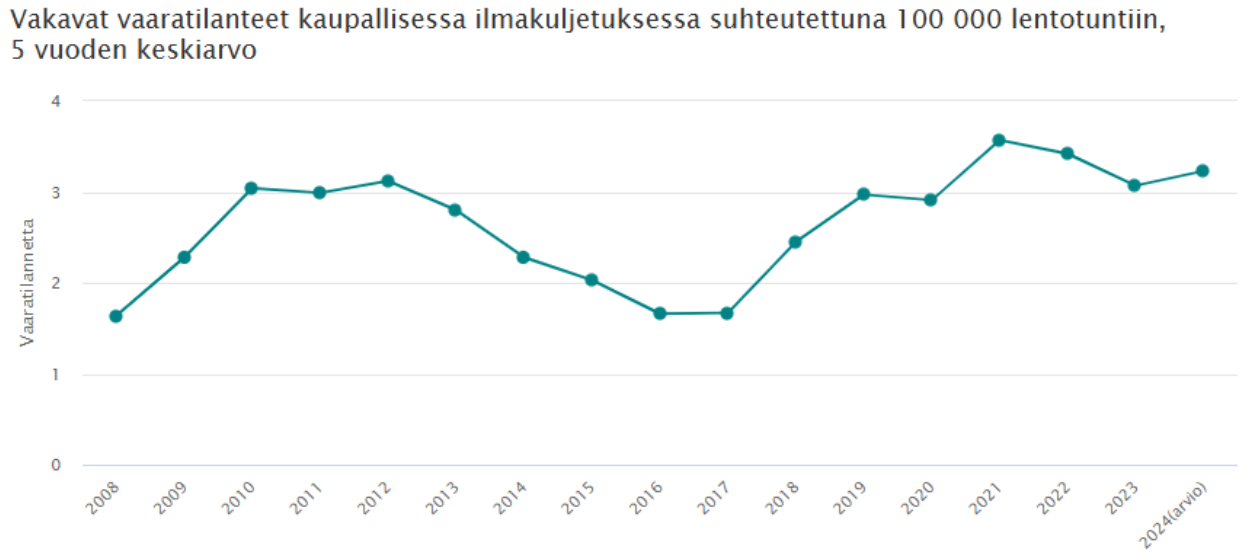
In addition to the situations involving Finnish aircraft, two serious incidents involving foreign commercial air transport occurred in Finland. In the first case, oil leaking from the engine of a foreign commercial aircraft caught fire at Helsinki-Vantaa Airport. The crew started the turbine engine, which put out the fire. In the second case, a foreign commercial aircraft started to move after pushback, even though the pushback tractor was still in front of the aircraft's nose gear. The tractor driver was able to warn the pilots to stop on the radio frequency, and the pilots were able to stop the aircraft before impact.

In August, OTKES began an investigation into a serious incident that occurred on a Norwegian flight from Rhodes to Helsinki on 11 August 2024. Two cabin crew members were injured when the aircraft encountered turbulent air flow. This incident does not appear in the statistics of this safety review, as it occurred outside Finnish territory and did not involve aviation organizations operating under a Finnish operating license.

Based on the current flight hour estimate for 2024, there would be approximately 4.8 serious incidents per 100,000 flight hours in 2024, compared to an average of 2.8 for 2014–2023. Thus, the number of serious incidents relative to traffic volumes was clearly higher than the long-term average.

You can view serious incidents since 2005 in an interactive, updated report on the tieto.traficom website.




**List of serious incidents 2024 (incl. foreign aircraft in Finland)**

1. February 2024: During the initial climb, an electrical fire smell was detected in the cockpit and cabin. The crew decided to turn back to land at the departure airport.
2. February 2024: While a foreign airliner was on the apron, oil leaked from its engine, which the hot engine ignited. The engine was started and blew out the fire.
3. March 2024: Near-miss situation between a commercial aircraft and a drone abroad.
4. March 2024: Near miss between an airplane and a paraglider abroad.

5. April 2024: The engine of a commercial aircraft failed and the aircraft returned to the airport of departure for landing.

6. April 2024: The medical helicopter's blades hit the branches of a tree in the shadows during takeoff. The takeoff was aborted.

7. April 2024: A small airliner encountered severe turbulence while descending from cruising altitude. One of the passengers was not wearing a seatbelt and hit his head on the ceiling panels, sustaining minor injuries. The flight was diverted to the nearest airport.

8. May 2024: Smoke was observed in the cockpit and cabin of a commercial aircraft during taxiing. The crew decided to abort the flight and evacuate the passengers. The smoke was caused by a technical issue on one of the aircraft systems.

9. May 2024: Near-miss between a Finnish commercial aircraft and a foreign small aircraft during approach.

10. June 2024: Smoke was observed on a commercial aircraft during the enroute phase. The crew made an emergency landing at a nearby airport and the passengers were evacuated. The cause of the smoke was possibly an oil leak in the engine. The Italian SIA has launched an investigation into the incident.

11. July 2024: A foreign airliner started moving after a pushback, even though the pushback tractor was still in front of the aircraft's nose gear. The tractor driver managed to warn the pilots by radio frequency to stop, and the pilots were able to stop the plane before impact.

12. July 2024: The airliner's pressurization system failed and the crew had to put on oxygen masks. The backup system was activated and the system returned to operation.

13. July 2024: A near-miss between a Finnish commercial aircraft and a foreign drone abroad.

14. July 2024: A medical helicopter was enroute in uncontrolled airspace near Oulu when a small aircraft suddenly flew very close to the rear left of the helicopter, slightly above it. The helicopter pilot made an emergency avoidance maneuver to reduce the risk of collision. According to the pilot's report, the risk would have been reduced if the other aircraft had had a transponder on, which would have been visible in the helicopter's ACAS system. OTKES investigated the situation.

15. November 2024: A near-miss between a Finnish commercial aircraft and a foreign drone abroad.

16. November 2024: A commercial aircraft had to wait a long time for approach clearance due to other traffic at a foreign airport and fly several holding circles in the air. Eventually, the fuel became so low that the crew had to notify air traffic control of a fuel emergency, meaning the flight had to land immediately. After this, the aircraft was given priority over other traffic and was able to approach. After landing, it was determined that the aircraft had less than the minimum fuel level.

# 2 General and recreational aviation safety situation 2024

**There were six accidents in Finnish general and recreational aviation in 2024, which is slightly below the average of the last ten years (8.4). Unfortunately, one accident resulted in a fatality when a general aviation aircraft crashed after an engine failure after takeoff. Both people on board died.**

There were 22 serious incidents reported, slightly higher than the ten-year average of 16.3. Last year, level 2 indicators – which describe the most common causes of accidents – recorded more runway excursions and near misses than average . However, on the positive side, the number of incidents involving loss of control of the aircraft remained low.

The number of general and recreational aviation operations, including aerial work, at Finnish airports decreased slightly, by approximately 0.5%, compared to the previous year. However, the decrease was not as significant as in 2023, when the number of operations decreased by approximately 15%.

A large part of general and recreational aviation takes place at uncontrolled aerodromes. Data on this activity is collected from aircraft owners through the annual flight activity declaration. Flight hour statistics for 2023 and previous years are available on Traficom's website . A graphical summary of the 2023 data can be seen in the spring 2024 safety bulletin .

This review does not address the situation of hang gliding, paragliding or parachuting. Information related to these is available on the website of the Finnish Aviation Association.

## 2.1 Accidents

In 2024, six accidents occurred in Finnish general and recreational aviation, which is clearly below the average for 2014–2023 (8.4). In terms of the number of accidents, the year went quite well, and in previous years there have also been fewer accidents than average. Unfortunately, last year, as in the three previous years, one of the accidents resulted in a fatality.

Of the six accidents in 2024, five occurred in general aviation and one in recreational aviation. Two of the accidents occurred during landing, which, as in previous years, has been the most typical phase of flight for accidents. In addition, two accidents occurred during take-off, one during the enroute phase, and one while the aircraft was on the apron.

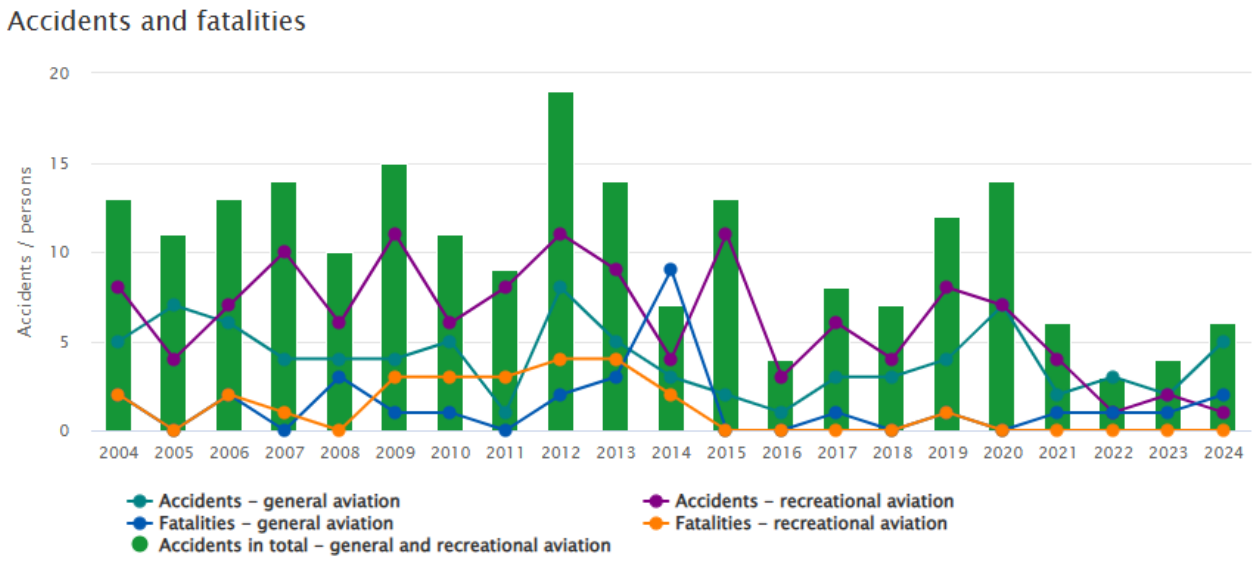
**In recreational aviation (ultralight aircraft, gliders)** the number of accidents was exceptionally low last year. Over the past ten years, there have been an average of about five accidents per year in recreational aviation, but over the past four years there has been a clear downward trend in the number of accidents. The only accident in recreational aviation this year occurred for an ultralight aircraft, when the pilot had to make an emergency landing due to an engine failure during the flight. During the landing, the aircraft rolled over its nose and was significantly damaged, but the people on board survived without serious injuries.

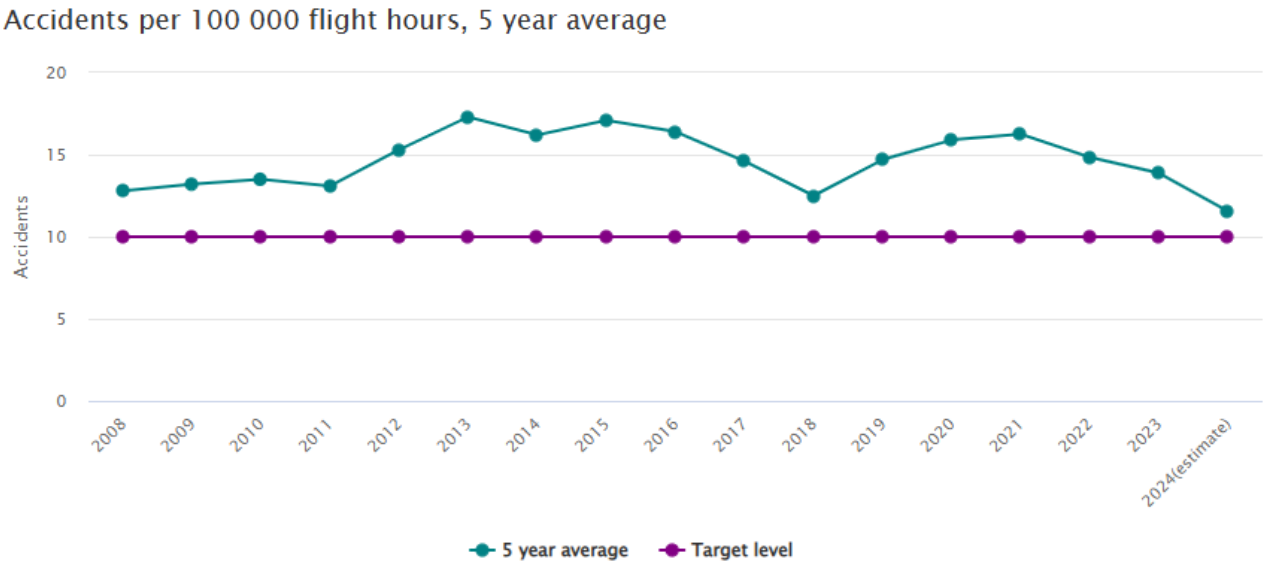
**In general aviation,** however, there were five accidents, which was significantly higher than the ten-year average (2.9). One of these accidents resulted in a fatality. General aviation has traditionally had fewer accidents than recreational aviation, but in 2020 and 2024, an exceptionally high number of accidents were reported in general aviation.

The fatal accident is described in more detail in the following section. Of the other general aviation accidents, two involved hard landings, one involved an emergency landing due to engine failure, and one involved an aircraft engine catching fire during start-up.

The flight hour data is collected annually from Finnish aircraft owners . Flight hour data for 2024 will be collected in spring 2025. In 2023, the activity of reporting flight hours improved compared to the previous year, which reduced the margin of error in the statistics. According to the reports, approximately 43,000 flight hours were flown in general aviation in 2023 and approximately 18,000 flight hours in recreational aviation.

The preliminary estimate of flight hours in 2024 is based on the previous year's data and airport operations. Based on these, the number of flight hours is estimated to have remained at the previous year's level. Based on this, approximately 11.6 accidents occurred in general aviation and approximately 5.6 accidents occurred in recreational aviation per 100,000 flight hours. The average for the years 2014–2023 was 8 accidents in general aviation and 22.2 accidents occurred in recreational aviation per 100,000 flight hours. Consequently, there were exceptionally few accidents in recreational aviation last year, while the number of accidents in general aviation was clearly high compared to both the longer-term average and the proportional number of flight hours.




Accidents per 100 000 flight hours, 5 year average
20
15
10
5
0
Accidents
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024(estimate)
5 year average
Target level

## 2.2 Fatalities

There was one fatal accident in 2024, in which two people died. The accident occurred in October at Räyskälä Airport, when an SNJ-3 general aviation aircraft crashed after takeoff after the engine failed. Both people on board died. The Finnish Safety Investigation Authority (OTKES) has opened an investigation into the incident L2024-02 .

The aircraft destroyed in the accident was a World War II-era aircraft that had just changed ownership. The aircraft was scheduled to be transferred from Finland to Germany after inspections. The deceased were both German citizens.

The incident has been tentatively classified as a loss of control of the aircraft in the air (LOC-I), but the causal factor will be clarified once the OTKES investigation is completed. LOC-I-type situations are a common background factor in fatal accidents.
On average, 1.5 fatal accidents occur in Finland or to Finnish aircraft per year (average for 2014–2023), so 2024 was slightly below average. On the other hand, an average of 1.7 people die in fatal accidents per year, so last year the number of victims rose slightly above average.

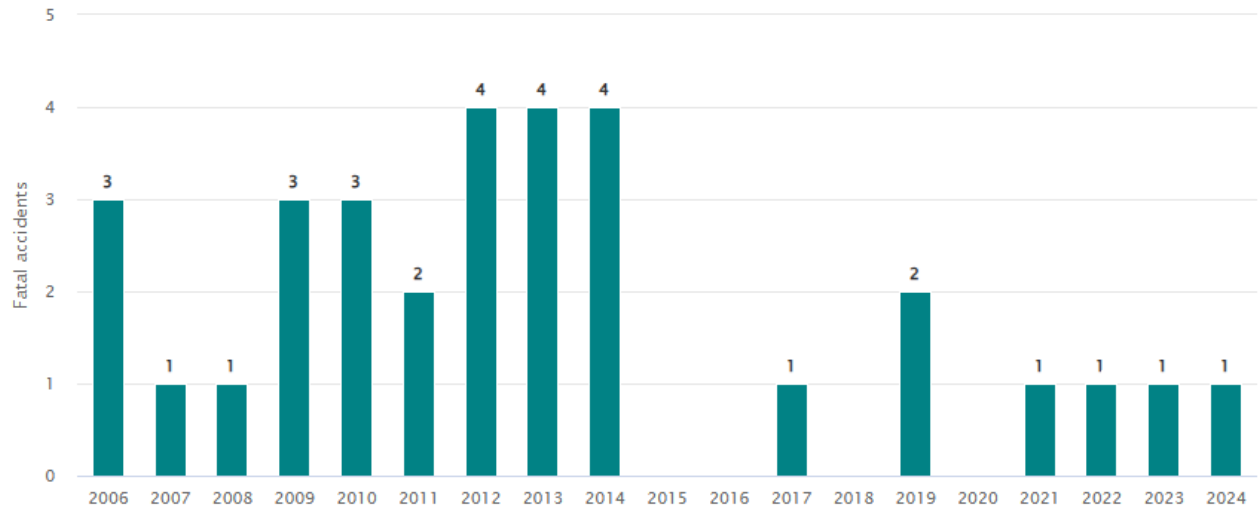
The previous fatal accident occurred in July 2023 at Selänpää Airport. The aircraft, which was performing an aerobatic display, crashed into the ground, killing the pilot. OTKES 's investigation L2023-02 was completed in June 2024. According to the investigation, the cause of the accident was a flat spin, which was initiated too low. Corrective actions were also initiated at too low an altitude, which led to the aircraft crashing into a forest at a steep angle. This was a CFIT (Controlled Flight Into Terrain) type situation, where the crash happened even though the aircraft was under the pilot's control.

Based on the investigation of the incident, OTKES issued two recommendations regarding the organization of display flights and the criteria for issuing a display pilot's certificate of approval.

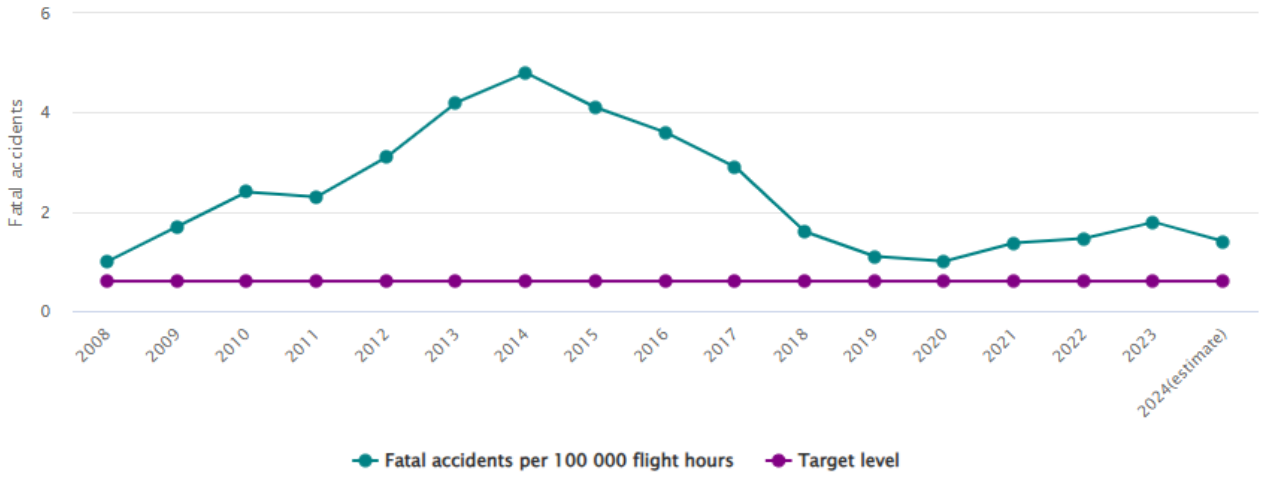
Although there have been isolated fatal accidents in recent years, the safety situation has improved significantly compared to 2013–2014. In both those years, there were four fatal accidents, resulting in a total of 18 deaths. It is still important to keep in mind that safety improvements do not happen automatically, but require continuous work from all parties involved.

You can view accident statistics from 2005 onwards in an interactive, updated report **on the tieto.traficom website .**

Fatal accidents in general and recreational aviation




Fatal accidents in general and recreational aviation per 100 000 flight hours, 5 year average




Fatalities in general and recreational aviation per 100 000 flight hours, 5 year average

**List of accidents in 2024 (including foreign aircraft in Finland)**

1. May 2024: A general aviation aircraft had towed a glider into the air and returned to land for the next tow. During landing, the aircraft sank surprisingly quickly and the tires hit the ground about 10 meters before the start of the runway, causing one of the landing gear to come off. The aircraft came to a stop on the runway. Wind conditions were a possible contributing factor.

2. May 2024: A general aviation aircraft engine caught fire during start-up attempts. The pilot tried to put out the fire, but the carbon dioxide extinguisher was not enough. The power and fuel supply were cut off and the fire subsided until the fire department could extinguish the fire. The aircraft was severely damaged.

3. June 2024: The nose wheel of an experimental aircraft folded after a hard landing and the aircraft was damaged.

4. August 2024: A general aviation aircraft lost oil pressure in its engine during flight, forcing the pilot to make an emergency landing in a nearby field. During the landing, the aircraft rolled over its nose, sustaining significant damage.

5. September 2024: An ultralight aircraft made an emergency landing after an engine failure and rolled over on its nose. The occupants escaped without major injuries, but the damage was significant.

6. October 2024: A general aviation aircraft crashed after takeoff, killing 2 people on board. OTKES investigation. The causes will be determined once the investigation is complete.

## 2.3 Serious incidents

In 2024, a total of 22 serious incidents occurred in Finnish general and recreational aviation. The number was clearly above the average for 2014–2023 (16.3). Of the incidents, 14 occurred in general aviation and 8 in recreational aviation. In one incident, both general and recreational aviation aircraft were involved.

The types of serious incidents followed the trends of previous years. Hard landings (6), technical failures (5), runway excursions (4) and mid-air near misses (3) were the most common causes of incidents.

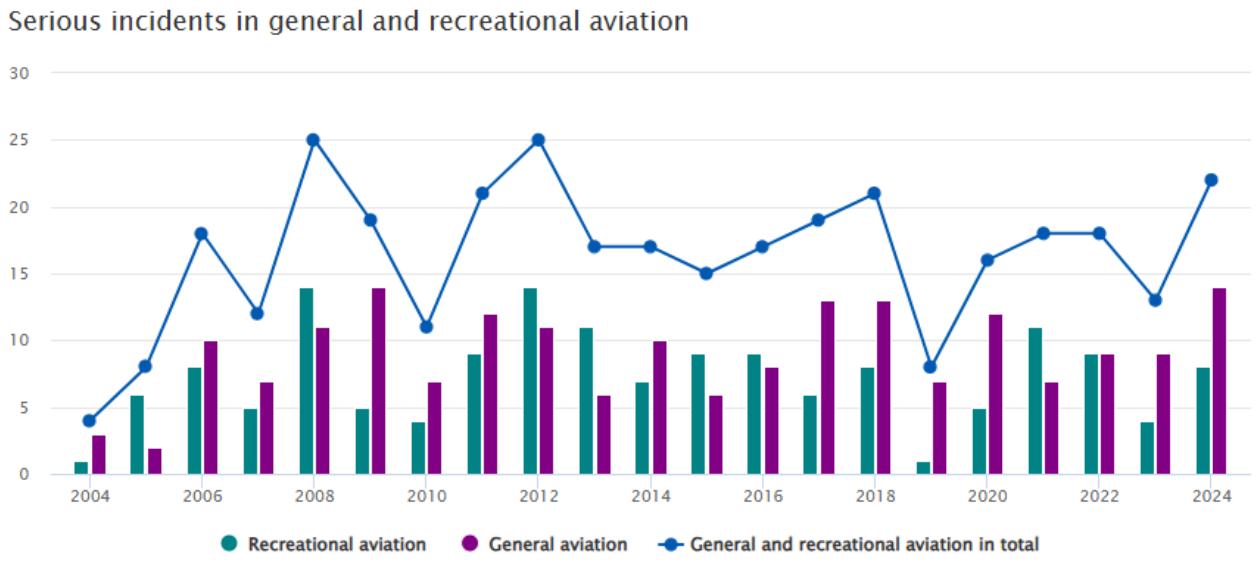
**In recreational aviation,** the number of serious incidents (8) slightly exceeded the average for 2014–2023 (6.6). Half of the incidents occurred during landing, but the spectrum of incidents was wide, including technical failures, abnormal landings and runway excursions.

**In general aviation,** the number of serious incidents (14) was also above the ten-year average (10.7). Most incidents occurred during landing. Examples included harder than normal landings, landing gear failure or other abnormal runway contact, some of which resulted in runway overruns. The next largest group was various technical failures.

The year was overall similar to previous years in terms of types of serious incidents, but the number of incidents was higher than average.

Based on the current flight hour estimates for 2024, it is estimated that in 2024 there will be approximately 32.6 serious incidents per 100,000 flight hours in general aviation and approximately 44.4 serious incidents per 100,000 flight hours in recreational aviation. The average for 2014–2023 was 26 serious incidents per 100,000 flight hours in general aviation and 32.8 serious incidents per 100,000 flight hours in recreational aviation. In 2024, serious incidents occurred in both general and recreational aviation, also in proportion to traffic volumes, above the average.

**You can view accident statistics from 2005 onwards in an interactive, updated report on the tieto.traficom website .**




**List of serious incidents 2024 (incl. foreign incidents in Finland)**

1. January: Smoke began to enter the cockpit of a general aviation aircraft after takeoff. The pilot landed back at the airport. The smoke was possibly caused by a malfunction in the landing gear.

2. January: The engine temperature of the general aviation training aircraft began to rise during the enroute phase. As a result, it was no longer possible to increase power or maintain altitude, so the pilots decided to make an emergency landing on a nearby beach. The emergency landing was successful.

3. April: A significant change in the engine noise of an ultralight aircraft was observed during the flight. The pilot decided to make an emergency landing before the situation could worsen. Minor damage to the aircraft occurred during the landing.

4. April: A general aviation training aircraft skidded to the left side of the runway during a go-around, but the pilot managed to get back into the air and later landed safely. The landing in tailwind conditions and wind shear were contributing factors.

5. April: A general aviation training aircraft skidded off the runway onto the grass during landing, where it was stopped. A contributing factor was that the landing was "on the shelf", during which the left tire touched the runway and caused the aircraft to change direction to the left and off the runway.

6. May: A glider was coming to land on the runway but had to change to a grassy area because the previous aircraft was still on the runway. The pilot announced the change on the radio frequency, but a van on the ground did not notice the glider and drove in front of it. The pilot was able to avoid the van and make a landing on the grassy area.

7. May: A near miss between two gliders in the final leg. The second glider approaching was clearly faster than the first, and had to take evasive action in the final leg.

8. May: The engine of an ultralight aircraft failed during flight. The pilot made an emergency landing in a field, and at the end of the landing the nose wheel fell into a ditch and folded under the aircraft.

9. May: While the glider pilot was turning into the tailwind at an altitude of approximately 300 meters, the glider suddenly went into a rapid left spin. The pilot was able to make the necessary corrections and right the plane, at the end the altitude was approximately 150 meters. The pilot was able to make a successful landing.

10. May: A general aviation aircraft's alternator belt broke during an enroute flight, causing the radiator water pump to stop and the engine to overheat. The pilot was able to make an idle landing on the runway of a nearby airport.

11. June: A parachute plane's landing failed, with the tail first hitting the runway and the subsequent nose-down landing causing the propeller to hit the runway. Both the tail and propeller sustained minor damage. Contributing factor was turbulent crosswinds.

12. June: A general aviation aircraft's carburetor caught fire during start-up, possibly due to over-enrichment of the mixture. The pilot noticed the fire and continued to start the engine, the fire went out when the engine started.

13. June: A general aviation aircraft piloted by a student pilot on a solo flight skidded off the runway during a touchdown. The pilot was able to apply the brakes, but the wing of the aircraft hit a caravan on the edge of the field. More serious damage was avoided.

14. June: During landing, a general aviation aircraft on a training flight remained "on the shelf" and stalled, causing a hard landing and damage to the aircraft.

15. July: The pilot of an experimental aircraft forgot to lower the retractable nose gear while landing on the runway. The aircraft skidded on its nose for a short distance, coming to a stop on the runway and sustaining minor damage. Contributing factors were a stressful situation with the new aircraft type and gusty wind conditions, which affected concentration. The pilot stated as a preventive measure that due to the speed of the aircraft type in question, the approach briefing could be conducted much earlier in the future.

16. July: A general aviation aircraft lost power during initial climb, the engine went to idle and the throttle position no longer affected the RPM. The aircraft was still close enough to the departure field that the pilot was able to successfully perform an idle landing back to the runway. On the ground, the pilot noticed that the electrical connector on the throttle was loose. The connector was properly installed and operation was normal thereafter.

17. July: A glider was on its final approach when a paraglider unexpectedly flew in front of it. The glider was on a training flight, and the instructor avoided the collision by steering the plane slightly downward. The paragliding activity had been scheduled to take place on the other side of the field, but in this case the glider ended up out of the area.

18. July: A medical helicopter was en route in uncontrolled airspace near Oulu when a small aircraft suddenly flew very close to the rear left of the

helicopter, slightly above it. The helicopter pilot made an emergency avoidance maneuver to reduce the risk of collision. According to the pilot's report, the risk would have been reduced if the other aircraft had had a transponder on, which would have been visible in the helicopter's ACAS system. OTKES conducted an investigation into the situation.

19. July: An ultralight aircraft was on a training flight from Kiikala to Nummela. The flight student reported an estimate to the border of the Nummela area on the Nummela frequency. When the ultralight was almost at the border of the area, the crew suddenly noticed another aircraft approaching from the rear right at a higher speed. The other aircraft was a general aviation aircraft, also on a training flight, and the aircraft's instructor said after the flight that he had only noticed the ultralight very close and had made an immediate evasive maneuver. There was a distance of about 10-20 meters between the aircraft. The general aviation aircraft's flight path had been slightly above the ultralight, in a slight downward glide. It is possible that the crew of the general aviation aircraft had not heard the ultralight's traffic announcement because they were listening to the Nummela information at the same time. The crews discussed the situation after the flight, and stated that very vigilant observation of airspace and other traffic in Nummela was the most important thing to prevent similar situations.

20. September: A recreational aircraft (the model was not specified in the report) made a bounce landing and as a result of the recovery maneuver, the aircraft ended up on the side of the runway in a grassy area. The situation was resolved without damage.

21. September: A powered glider was taxiing to the end of the runway for takeoff. During the taxiing, the wind pushed one wing downwards, causing it to hit a runway edge light pole. The pole broke and the plane's wing was fractured.

22. December: A general aviation aircraft landed in Oulu, but after landing the aircraft began to bank sharply to the left and ended up slightly over the edge of the runway onto grass. The pilot was able to power the aircraft back onto the runway. It turned out that the tire on the left main landing gear had burst due to a snow sweeper spike that had apparently come loose from a maintenance vehicle.

# 3 Safety situation in other areas of aviation in 2024

## 3.1 Air navigation services

**In 2024, there were 32 separation minima infringements with Finnish ATS contribution.** The number was at the level of the average for 2014–2023 (32.9). In relation to the number of operations, the number of separation minima infringements was approximately at the level of the long-term average. The majority of separation violations occurred at Helsinki Airport, as in previous years. However, in relation to the number of operations, separation violations occurred less frequently at Helsinki Airport than at other airports on average. The next highest number of separation violations was recorded at Jyväskylä and Rovaniemi.

Of the incidents, 20 were infringements of the radar separation minima between aircraft, which was higher than the 2014–2023 average. There were three infringements of the wake turbulence separation minima, which was about half the average of previous years. The remaining incidents were mainly related to separations between aircraft and different types of airspace, the number of which was approximately at the level of the long-term average.

Overall, the number of separation minima infringements remained at the level of previous years. However, there is no significant negative trend associated with the increase in the number of separation minima infringements between aircraft. On a positive note, the number of wake turbulence separation minima infringements was clearly lower than in previous years.

**Last year, four runway incursions with Finnish ATC contribution were recorded.** This number was below the average for 2014–2023, also in relation to the number of operations. The incidents did not pose a significant risk. Runway incursions with ATC contribution have been rare in recent years. These situations are discussed in more detail in the runway incursions section.

## 3.2 Aerodrome operations

**In 2024, 23 runway incursions caused by ground vehicles at airports.** The number was slightly above the average for 2014–2023 and the same as the previous couple of years. Most runway incursions occurred at Helsinki Airport, followed by Kuopio and Kuusamo. However, there is significant annual variation in the locations of the incidents – for example, in 2023, the majority of incidents occurred at completely different airports than last year.

The majority of the incidents in 2024 occurred during winter months, which has also been typical in previous years. The number of runway incursions decreased steadily between 2017 and 2021, but started to increase in 2022. More incidents were recorded in 2024 than at any time in the last 10 years. However, no significant consequences resulted from the incidents.

In addition to airports, runway incursions caused by ground vehicles also occurred at uncontrolled airfields, where four incidents were recorded. Although the number is quite small, it is still higher than in previous years. A more detailed overview of the situation can be found in the Runway incursions section .

## 3.3 Ground handling

Ground handling caused no aviation accidents or serious incidents in 2024. In one case, the prompt action of a pushback tractor driver even prevented a collision between an aircraft and a tractor.

Ground handling operations cover various tasks related to the handling of aircraft, passengers and baggage. For example, boarding passengers is part of ground handling. In addition, ground handling organizations are responsible for loading aircraft, de-icing and anti-icing, refueling and moving aircraft at the airport. The operations also include other apron services. Ground handling tasks are often performed when the aircraft has already landed and there are no passengers or crew on board. Accidents that occur at this stage are classified as occupational accidents and are not aviation accidents.

Although such incidents are rare, there was one fatal accident classified as an occupational accident in 2024. In November, a worker died at Helsinki Airport when a pushback tractor began pushing an aircraft, and the worker was trapped between the aircraft and a toilet servicde truck. The incident is being investigated by the police and the Regional State Administrative Agency.

Less than a week later, another serious incident occurred when an employee loading an aircraft was crushed under a baggage container. Fortunately, the incident did not result in serious injuries.

Ground handling operations involve handling heavy containers, cranes and other heavy equipment in close proximity to aircraft, which brings its own risks to the operation. Working conditions can be challenging, as noise, weather conditions and schedule pressures affect the daily lives of employees. To ensure safety in such conditions, it is of paramount importance to strictly follow regulations, operating instructions and maintain good situational awareness.

Other ground handling incidents were mainly reports of damage to aircraft caused by ground handling equipment, errors in weight calculations or loading deviations. These incidents are discussed in more detail in the LOC-I section .

## 3.4 Unmanned aviation

**In 2024, four near-miss incidents between drones and manned aircraft were reported in Finland.** This was significantly below the 2014–2023 average (8.7). None of the incidents resulted in a serious incident, the same as in 2023. In previous years, an average of 1.9 incidents per year have been classified as serious incidents.

The situation in Finland has overall improved in recent years. In the peak year of 2018, 23 near misses were reported, while in 2024 the number was only four. All of the incidents last year occurred near Helsinki-Vantaa Airport, and the drone was flown in a location that suggested intentionality. These incidents could have easily been avoided.

Although the situation in Finland has improved, in recent years, Finnish aircraft have increasingly encountered near-misses with foreign drones abroad. In 2024, 11 such incidents were reported, which was a decrease from 17 incidents the previous year. However, the number was still clearly above the average for 2014–2023. Three of the incidents were classified as serious incidents, which is in line with the level of previous years. Most of these incidents occurred in England, especially near London and Manchester.

In these cases, Traficom reports the incidents to the authorities of the country in question.

The number of airspace infringements caused by drones in Finland in 2024 remained at about the same level as in previous years, but the number of incidents was still slightly above the long-term average. The main targets of infringements were once again Helsinki-Vantaa and Ivalo airports. Airspace restrictions and the maximum permitted flight altitude can be easily checked on the drone map in the Flyk application , which is recommended to be used before flying a drone.

The European-wide regulation on drone operations that came into force at the beginning of 2021 has helped to improve the situation, and positive developments can be observed in Finland. The regulation imposes registration obligations and training requirements on drone pilots. In addition, new requirements have come into force from the beginning of 2024 regarding the classification markings of drones placed on the market.

More information about regulations and drone operations can be found on the droneinfo.fi website maintained by Traficom .

# 4 Traficom's work to improve safety in 2024

In 2024, aviation safety priorities were identifying operational changes and addressing threats caused by the war in Ukraine, proactive risk management, fatigue management as part of risk management, and improving the quality of incident reporting. Based on these prioritized safety measures, the Finnish Aviation Safety Plan was also updated .

At the beginning of the year, a large number of satellite navigation interference began to be observed in Finland and nearby areas. In addition to air traffic, the disturbances affected other modes of transport and activities that utilize satellite navigation. On aircraft, the interference often led to the use of alternative navigation systems. Although the interference was widespread, it did not affect traffic safety. In the autumn, Traficom published website *Satellite navigation service interference in Finland*, which compiles a current situational picture from the perspective of aviation, shipping and other terrestrial radio disturbances.

Preparations for the implementation of the EU regulation on aviation cybersecurity (Part-IS) continued actively during the year. More information on the matter can be found on Traficom's aviation cybersecurity website .

National risk management work continued in accordance with the revised process introduced the previous year. During the year, several joint risk workshops were organized with aviation organizations, where the organizations participated in the development of national risk management.

Traficom published four safety bulletins during the year . In autumn, the traditional winter operations bulletin was published. The bulletin has its own version for both airlines and general and recreational pilots. In connection with the publication of the bulletin, Traficom organized a virtual seminar in cooperation with the Finnish Aviation Association, where there was a lively discussion about winter flight operations.

During the year, Traficom also communicated extensively about current aviation topics through other newsletters and bulletins.

In March, a seminar on organizing air shows was held. There was a fatal accident at an air show the previous year, and the goal of this event was to promote safety in this type of activity.

The annual Lentoon! seminar was held in April , in collaboration with the Finnish AOPA (responsible for the organization last year), the Finnish Aviation Association, Fintraffic ANS, Finavia and the Finnish Meteorological Institute. The event was organized remotely.

In November, the Aviation Safety Forum was held in Helsinki, where aviation safety management was discussed from a practical perspective. The main themes of the event were proactive risk management and fatigue management as part of safety management, as well as the importance of human factors from the perspective of organizations and national risk management. The event featured various speeches and lively discussions. The presentations can be viewed on Traficom's website.

More information on aviation safety, including links to safety bulletins published by Traficom and other sources of safety information, can be found on Traficom's aviation safety information website .

# 5 Flight safety reporting 2024

Open reporting of observed occurrences and fair processing of reports is one of the most important pillars of safety in aviation. The more reports are made, the better we can identify areas for development and improve safety. A large number of reports can be regarded as a sign of a good safety culture. In Finland, the principles of a just safety culture (Just Culture) are followed in the processing of flight safety reports. This process is described in more detail in Chapter 2.5 of the Finnish Aviation Safety Program .

In 2024, Traficom received approximately 19,600 aviation safety reports. The number was approximately 2,000 reports higher than the previous year and more than double the average for 2014–2023 (approximately 8,500 reports).

The most significant reason for the increase in the number of reports was the continued increase in reporting of GNSS interference both in Finland and abroad. There were approximately 7,200 of these reports. The reporting activity of other incidents also increased significantly. The number of these reports was approximately 12,400, compared to approximately 11,000 in 2023 and an average of 7,500 reports per year for the years 2014–2023.

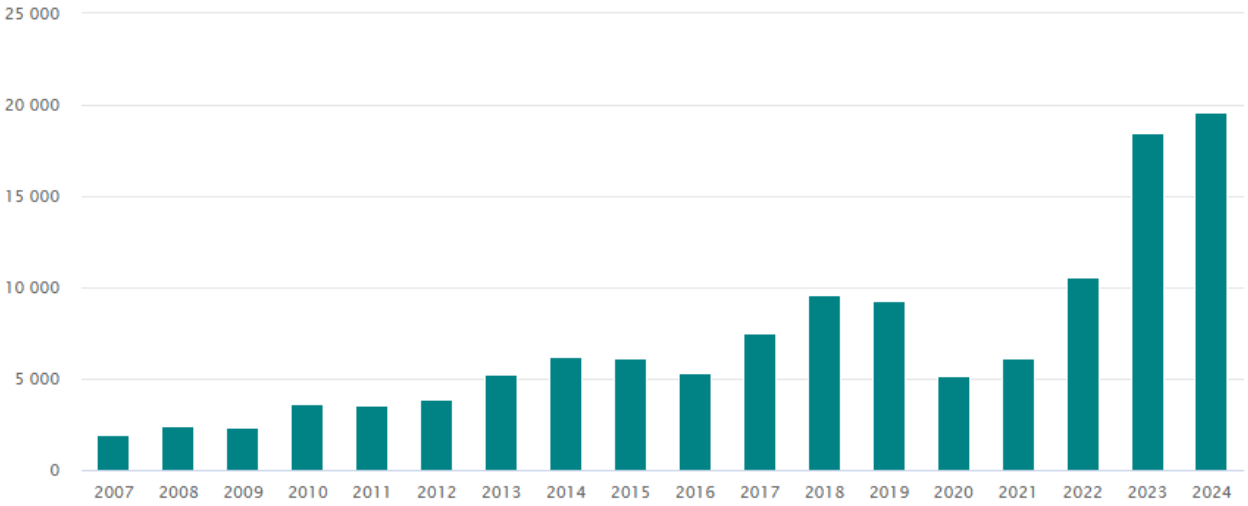
The level of reporting activity can be assessed by relating the number of reports to the number of aviation activities. Currently, only airport operation numbers are available, which do not cover all aviation activities, but give a general picture of the development. In 2024, approximately 6,800 cases were reported per 100,000 operations performed at airports, while the corresponding figure was approximately 6,600 in 2023 and approximately 3,900 in 2022.

If we look at reports other than GNSS interference, the number was approximately 4,300 per 100,000 operations in 2024, compared to approximately 4,000 in 2023.

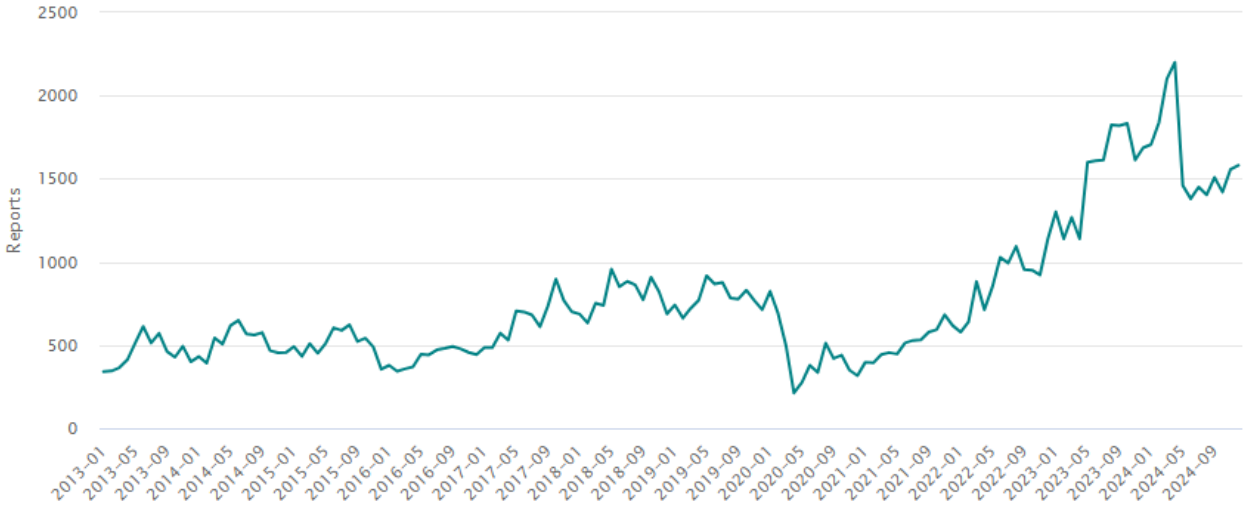
Overall, reporting activity improved significantly again in 2024, with increases in almost all areas.

In April, Traficom started to use the pan-European ECCAIRS2 aviation safety reporting system, which brought significant changes to both reporting forms and reporting processes. ECCAIRS2 is widely used by European aviation authorities and supports unified reporting and data management.

Flight safety reports



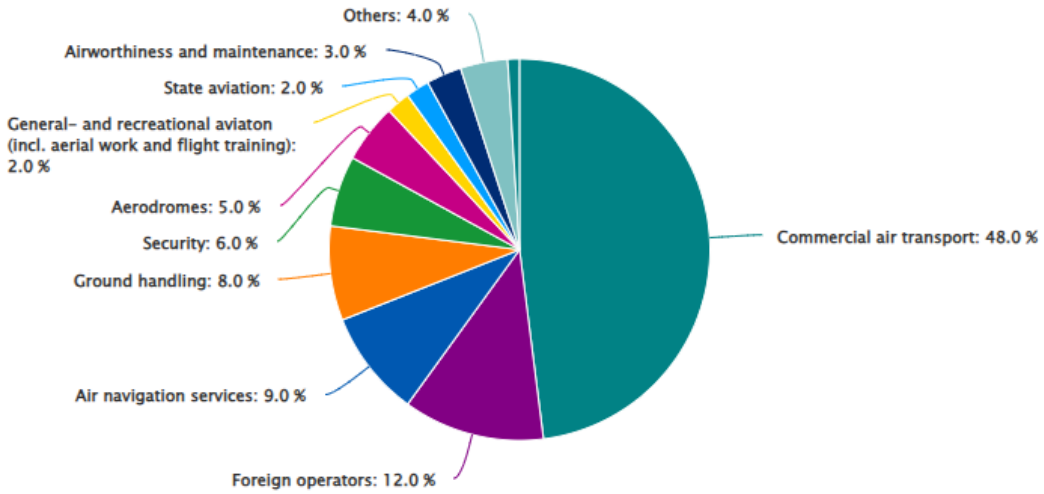

Number of reports per month since 2013



Reports are classified based on several variables.

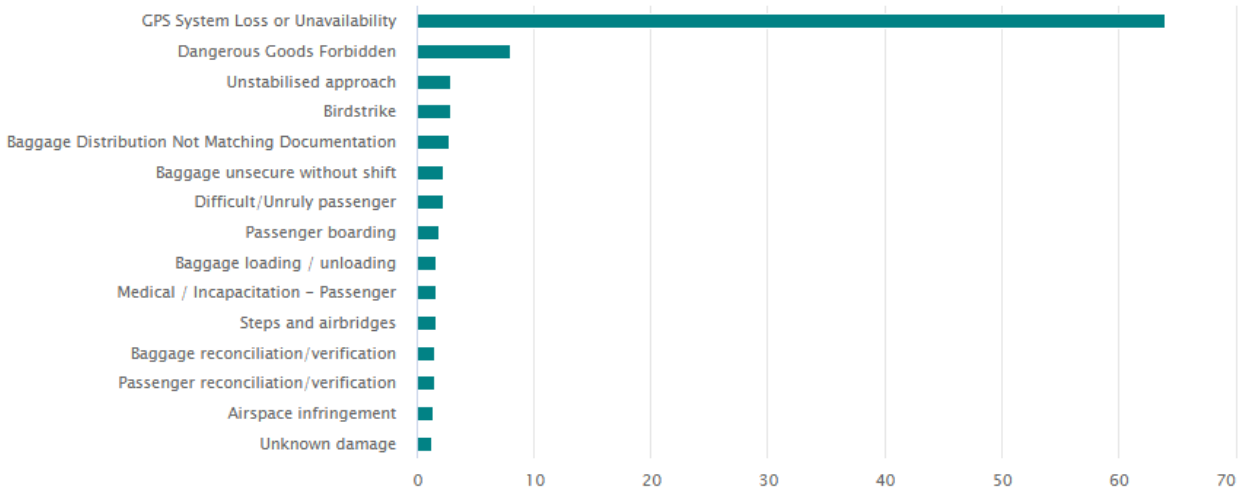
The graph below shows the distribution of incidents in 2024 based on the area of aviation the report covers. The majority of reports come from commercial operations, flight operations and various ground operations organizations.

Reports by aviation domain




The following graph shows the distribution of incidents in 2024 across the 15 largest event type categories. The distribution is presented as a percentage of the total. The event type categories are based on the pan-European ECCAIRS taxonomy. All event type categories and their descriptions according to the taxonomy can be found in the ECCAIRS2 taxonomy browser (folder path events/all attributes/event type/values).

Top 15 event types, as percentage of total



# 6 Runway excursions (RE) 2024

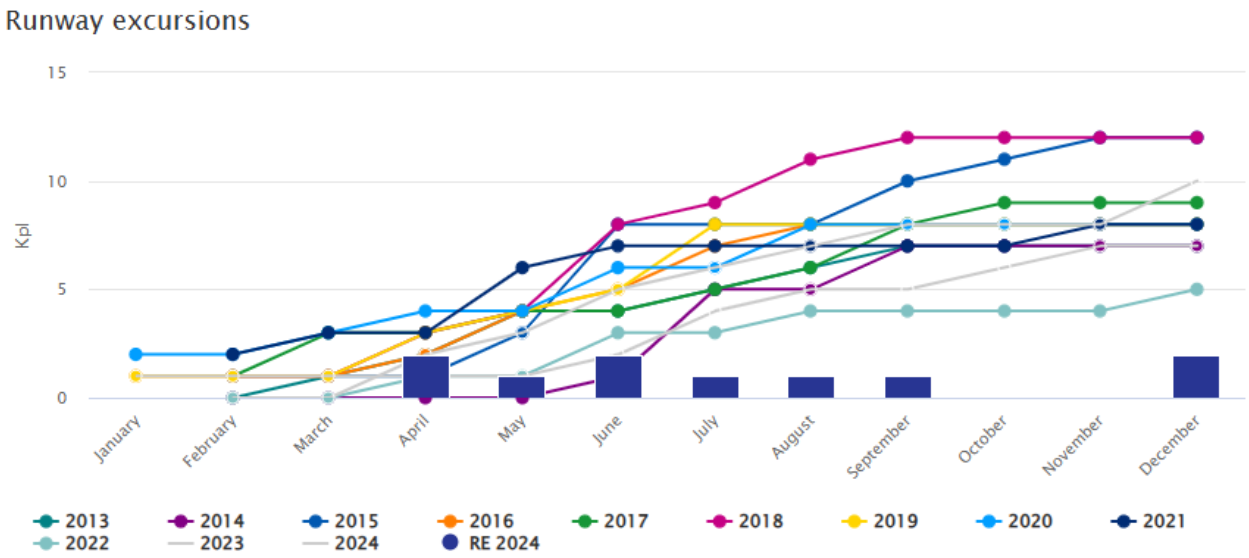
In 2024, 10 runway excursions were reported in Finland or involving Finnish aircraft. The number was slightly above the average for 2014–2023 (8.6).

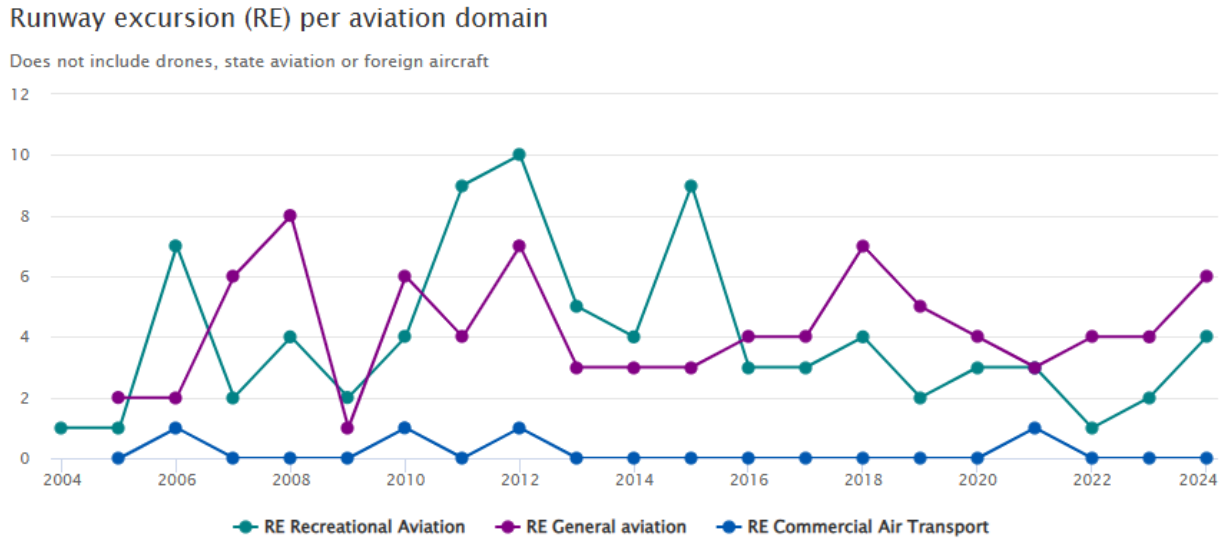
All incidents occurred in general or recreational aviation, as in most previous years. Two excursions occurred to Finnish aircraft abroad. None of the incidents resulted in an accident. In previous years runway excursions have typically resulted in about one accident per year. Four of last year's incidents were classified as serious incidents, which was slightly above the average (3 incidents per year).

Six runway excursions occurred in general aviation, which was slightly above the long-term average. Four incidents were reported in recreational aviation, which was also slightly above the average.

Most runway excursions occurred during the summer months and during landing, as in previous years.

In the 2024 cases, the reasons behind the excursions were diverse. The most typical were hard landings and damage to the landing gear or tires during landing, which led to the excursion. In several cases, wind conditions were a contributing factor. In the most serious hazardous situations, it was a hard landing that caused damage to the aircraft's structures.






## 6.1 Types of incidents contributing to runway excursions

Contributing events to runway excursions include, for example, unstable approaches, landing gear and reverse failures, rejected takeoffs at high speed, hard landings or otherwise abnormal runway contacts, and cases where information about runway conditions has been inadequate or incorrect.

Of these types of events, **unstable approaches** were at the level of the longer-term average in 2024. An unstable approach means that an aircraft does not follow the values specified during the approach, for example in terms of speed, altitude or angle of descent. For example, a landing at too high a speed can lead to a hard landing and a subsequent runway overrun. However, most unstable approaches were minor deviations and did not lead to significant hazards.

In 2024, just under 300 unstable approaches were reported, most of which occurred during commercial air transport approaches to Helsinki. The situation could often be complicated by, for example, challenging wind conditions. Although the number of incidents was at an average level, the number has been increasing since 2021. However, the 2024 figures are still far from the peak of 2017, when over 500 incidents were reported.

**Landing gear and reverse failures** were reported significantly more often than average. There were over 60 such incidents, compared to the average for 2014–2023 of around 41. Most of the incidents occurred in commercial air transport, but these did not lead to significant incidents. However, in general and recreational aviation, these incidents occurred more frequently in relation to traffic volumes. One incident led to an accident when the landing gear of a general aviation aircraft failed following a hard landing.

**Abnormal** runway contact events were also reported more than average, totaling just over 40 incidents. The numbers were high in both commercial air transport and general and recreational aviation.

About half of the commercial air transport accidents were related to landings that were too hard. However, the landing gear of passenger aircraft is structurally strong and can usually withstand hard landings without serious consequences.

In general and recreational aviation, abnormal contact resulted in three accidents and six serious incidents. These were also above average. Most of the cases involved hard landings, but in some cases the tail of the aircraft hit the landing pad. The landing gear of general and recreational aircraft is not as durable as that of commercial aircraft, and operations often take place on grassy or uneven surfaces, which increases the risks.

In two of the accidents, there was more than just a hard landing. In both cases, an engine failure in the aircraft during flight led to a forced landing, in which the aircraft rolled over on its nose as it hit the landing surface.

The number of cases where **runway conditions were not adequately reported or were incorrect** was also clearly above average. More than 30 of these cases were reported, compared to the average of around 15 for the years 2014–2023. These were often situations where the aircraft crew's assessment or the values provided by the aircraft's systems indicated that the runway was slipperier than officially reported. Most of the cases were reported in January and November, and the location of the events was most often Rovaniemi, as in the previous year.

In these cases, airport maintenance personnel checked the runway conditions and, if necessary, made new measurements. If necessary, the reported values were changed or measures were taken to improve the runway condition.

Traficom regularly publishes winter safety bulletins for both airlines flying to Finland and general and recreational pilots. Last year's bulletins were updated in early October and can be found on Traficom's website . Also worth reading is **the European Action Plan for the Prevention of Runway Excursions (EAPPRE ) document** published by Eurocontrol in 2013 , which contains a wealth of recommendations for preventing runway excursions. In addition, **GAPPRE (Global Action Plan for the Prevention Runway Excursions)** has been published , which aims to influence the prevention of runway excursions worldwide.

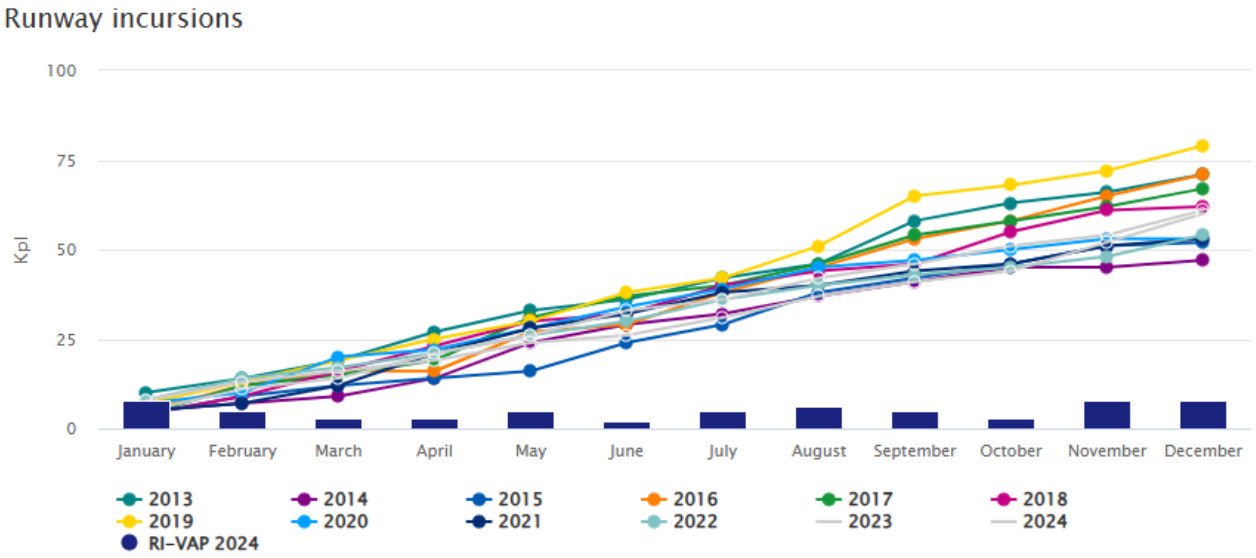
# 7 Runway incursions (RI-VAP) 2024

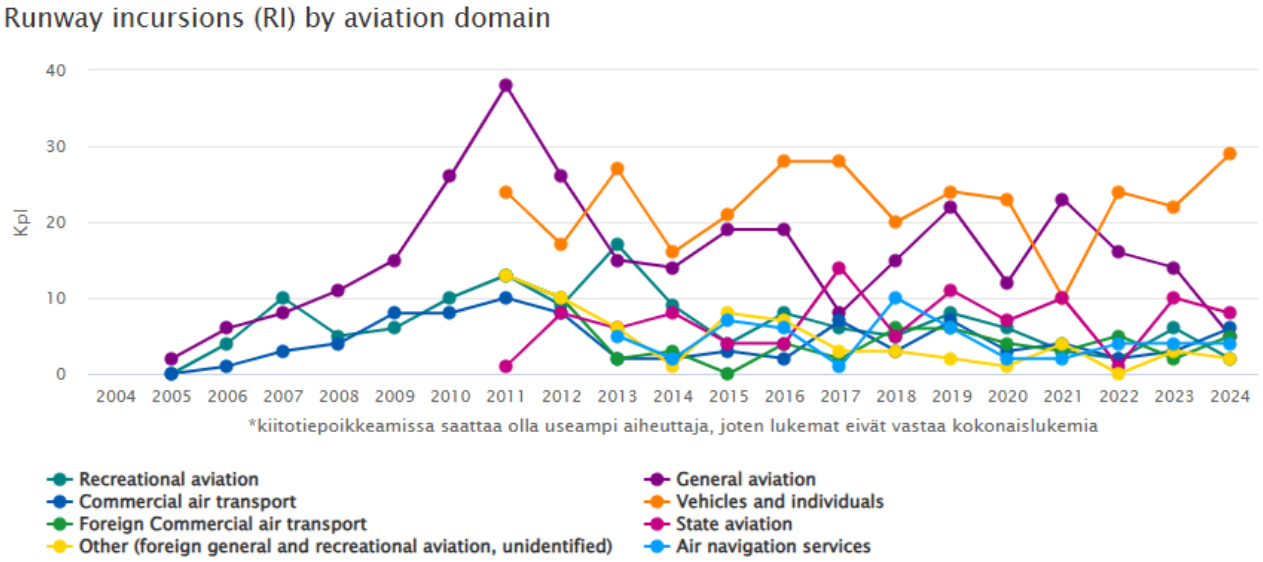
In 2024, 60 runway incursions, i.e., cases where an aircraft, vehicle or person was incorrectly on a runway or its protected area, were reported in Finland. The number was slightly above the 2014–2023 average (57), but almost at the same level as the previous year. Also, in relation to the number of operations, the number of runway incursions remained at the same level as the previous year (approximately 21 cases per 100,000 operations), but it was higher than the ten-year average.

One of the runway incursions was classified as a serious incident. Over the past ten years, runway incursions have resulted in an average of just under two serious incidents per year. The 2024 serious incident occurred at an uncontrolled aerodrome, as has been typical in previous years. In the incident, a glider was forced to abort its landing and go around when a van appeared on the runway.

Runway incursions have not caused any accidents in Finland in the last ten years.

A runway incursion is defined as a situation in which an aircraft, vehicle or person enters a runway or its protected area without permission or otherwise in error. At uncontrolled aerodromes where there is no air traffic control to issue runway clearances, incursions are classified as runway incursions if it is assessed that another aircraft, vehicle or person has entered the runway in a significant error.






## 7.1 Aircraft

Last year, 26 aircraft runway incursions were reported in Finland. This was clearly below the 2014–2023 average (34). The number of aircraft runway incursions has been decreasing for several years, and the same trend continued in 2024.

Runway incursions typically occurred in military or general aviation. Last year, most of the incidents were related to military aviation, but the number was at the average level. Fewer incidents than average were reported in general aviation.

In commercial air transport, six runway incursions occurred, which was significantly higher than the previous average (about three per year). These incidents did not cause significant risk to other aircraft. Last year, the number of commercial air transport incidents was increased by three runway deviations in commercial helicopter operations. In previous years, runway incursions caused by helicopter operations have been relatively rare.

The most common locations for runway incursions in 2024 were Helsinki, Jyväskylä, Rovaniemi and Tampere-Pirkkala. The same airports have often been the locations of occurrences in previous years, due to the busy traffic at these airports. Relatively speaking, there have been no significant changes in the numbers.

Runway deviations most often occurred during landing (the aircraft landed without the required clearance) or taxiing (taxiing onto the runway without clearance). Slightly less frequently, but still quite often, the incursion occurred during takeoff, when the takeoff was made without the required clearance. In 2024, this phase of flight was the most common time for runway incursions to occur.

There were no serious incidents or accidents in Finland due to runway incursions caused by aircraft. However globally, in January, a serious accident due to a runway incursion occurred at Tokyo's Haneda Airport. A Dash 8 aircraft of the local border guard taxied onto the runway without permission at the same time as a Japan Airlines Airbus A350 was landing. The collision could not be avoided, and

both aircraft were destroyed. The passengers of the Airbus were successfully evacuated, and all those on board survived. Only one of the people on the other aircraft survived. The investigation into the incident is still ongoing.

Such serious runway excursion accidents are extremely rare. The most serious incident of the 2000s occurred in 2001 at Milan Linate Airport. In bad weather conditions, an SAS MD-87 collided with a Cessna 525 that had incorrectly taxied onto the runway in front of the MD-87. A total of 118 people died in the accident.

## 7.2 Vehicles

In 2024, vehicles caused 23 runway incursions at Finnish airports. The number was at the same level as in previous years but clearly above the average for 2014–2023 (15). Also, relative to the number of operations, there were more vehicle runway incursions than average. However, the incidents did not cause significant consequences.

As in previous years, the majority of runway incursions caused by vehicles occurred during the winter months, especially in January and November-December. During these times, airport maintenance often needs to clear runways of snow. In some cases, the vehicle driver forgets to request permission to use the runway. Sometimes this forgetfulness can be due to the fact that other maintenance equipment is already on the runway.

Most of the incidents were recorded in Helsinki-Vantaa, Kuopio and Kuusamo. In the previous year, the majority of incidents occurred in Jyväskylä, Tampere-Pirkkala and Ivalo. The distribution of incident locations varies from year to year.

The number of runway incursions caused by vehicles decreased steadily until 2021, but since then the number has started to increase, although airport operators have implemented several measures to improve the situation.

One runway excursion caused by a vehicle was classified as a serious incident. In the incident, a glider was landing at an uncontrolled airfield in Räyskälä when a van unexpectedly drove onto the runway in front of the aircraft. The pilot had to take evasive action to avoid a collision. However, such serious incidents caused by vehicles are exceptional.

## 7.3 Persons

Five runway incursions caused by people in the runway area were reported in 2024. The number was clearly below the 2014–2023 average (17.1), but slightly higher than the previous year.

Compared to the previous couple of years, exceptionally last year the majority of incidents (3) occurred at controlled airports. Typically the majority of incidents caused by individuals have occurred at uncontrolled aerodromes, where it is more challenging to control access to the area. For example, Nummela aerodrome has been a relatively common location in previous years, and last year one such situation was reported from Nummela. The incidents reported at controlled airports occurred at different airports across Finland.

There are many reasons why people may end up on the runway without permission, such as poor knowledge of the area or airport operating procedures.

Operators of uncontrolled aerordomes have several means at their disposal to prevent such situations. These include placing warning signs in critical locations, information campaigns in local newspapers and, if necessary, using physical protection such as gates or fences, if possible.

## 7.4 Air traffic control

Air traffic control contributed to four runway incursions last year. The number was at the level of both the 2014–2023 average and the average relative to the number of airport operations.

All incidents occurred at Helsinki-Vantaa Airport. Also in previous years, the majority of runway incursions with air traffic control contribution have been recorded in Helsinki, which is due to the high number of operations at the airport. However, relative to the number of operations, Helsinki has relatively few runway incursions.

Runway incursions with air traffic control contributions have been rare in recent years, and this positive situation continued in 2024.

## 7.5 Traficom's actions to reduce the number of runway incursions

Traficom has published several safety bulletins regarding runway incursions over the years. In 2013, **a bulletin (pdf) was sent to all aviation license holders** and in November 2018 , **a safety bulletin was published, which, among other things, reminded of typical runway incursions. The safety bulletin** published in October 2019 reviewed the events of summer 2019, including runway incursions. **A safety bulletin was also published in June 2020** , where one of the topics was runway safety. The bulletins still contain useful tips for avoiding runway incursions.

At the end of 2017, the European aviation organizations updated the **European Plan for Prevention of Runway Incursions (EAPPRI** ). EAPPRI contains numerous recommendations, and all parties should review the document and strive to implement the recommendations to the extent possible. In September 2018, Traficom submitted a survey to aviation organizations to determine the implementation status of the recommendations in Finland. Based on the responses received, approximately 80% of the EAPPRI recommendations had either been implemented or will be implemented.

# 8 Near misses and collisions in the air (MAC/Airprox) 2024

In 2024, a total of 68 near-misses between aircraft were reported in Finland or to Finnish aircraft abroad. This number was clearly above the average for 2014–2023 (approximately 41).

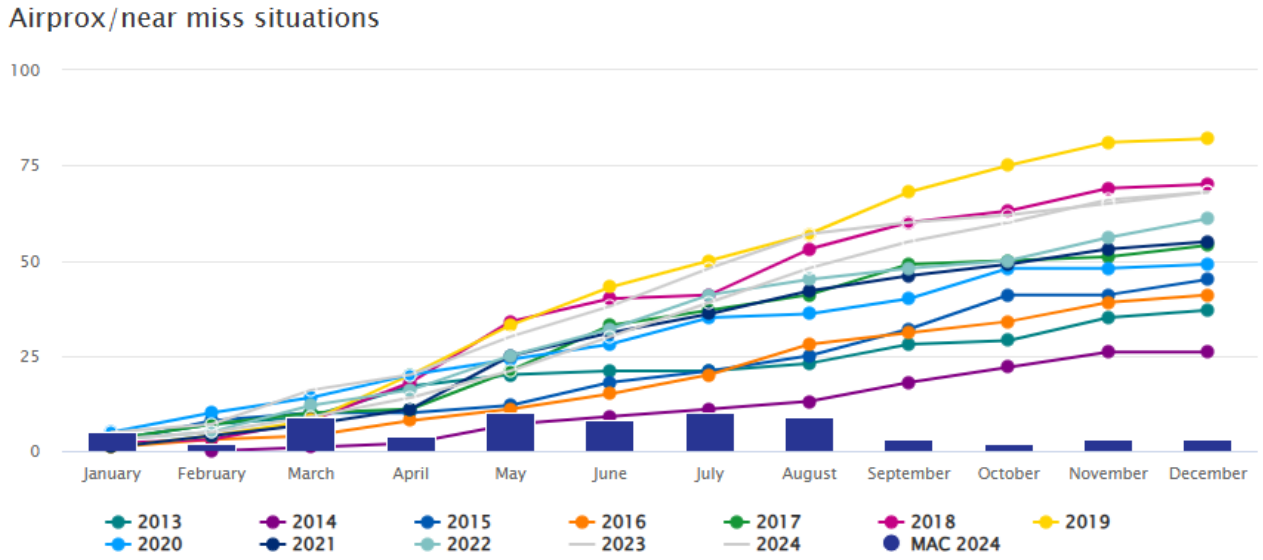
There were 40 reported incidents in Finland, which was above the ten-year average (approx. 32). Abroad, 28 incidents were reported, which was more than double the average of previous years (approx. 12).

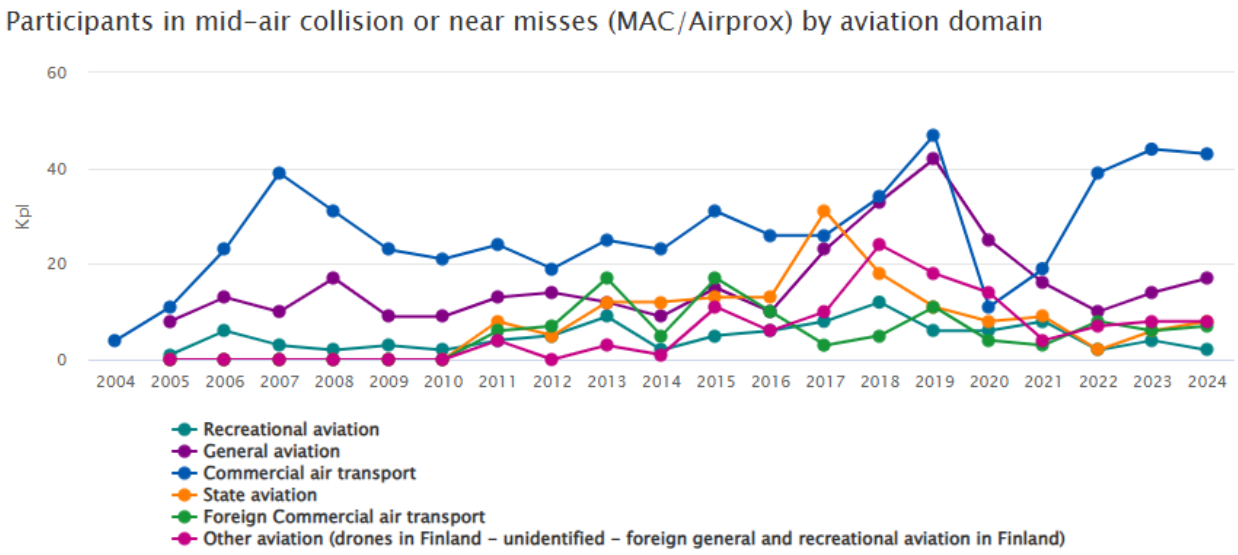
In none of the cases was there an actual collision, similarly as in previous years. However, eight cases were classified as serious incidents, which was slightly above the long-term average. Five of these occurred abroad and three in Finland. The number of serious incidents abroad was higher than average. In the majority of cases, the other party was a drone flown too high. In addition, two serious incidents occurred when a Finnish aircraft was operating at a foreign uncontrolled aerodrome.

The number of serious incidents in Finland remained below the long-term average. All serious incidents involved situations between manned aircraft that occurred at an uncontrolled aerodrome or in uncontrolled airspace. In previous years, serious incidents caused by drones have been common, but no such incidents have been reported in the last two years.

The Finnish Safety Investigation Authority (OTKES) conducted an investigation into one serious incident . The incident involved a medical helicopter in uncontrolled airspace near Oulu during the en route phase of the flight. Suddenly, a small aircraft flew very close to the rear left of the helicopter and slightly above it. The helicopter pilot had to make an emergency avoidance maneuver to avoid a collision.

According to the pilot's report, the risk of collision could have been reduced if the other aircraft had had a transponder on, which would have made the small aircraft visible to the helicopter's ACAS system.






## 8.1 Commercial air transport

Finnish commercial air transport was involved in 43 near-miss incidents in 2024. The number was clearly above the average for 2014–2023. Of these, 16 incidents occurred in Finland and 27 abroad. The number of incidents reported abroad was significantly above the long-term average, and the numbers have been increasing for several years. The number in Finland was also above the average, but at the same level as in previous years.

In Finland, the location of the incident in almost all cases was Helsinki-Vantaa Airport, which has also been the most common location in previous years. The numbers did not differ significantly from previous years. In the majority of cases, there was a separation minima infringement between aircraft, but the infringements were not very significant. In two cases, the drone was flown too close to commercial air traffic when the aircraft was coming to land.

One near-miss incident in Finland was classified as a serious incident. This was the previously described incident between a medical helicopter and a general aviation aircraft. However, the number of serious incidents remained below the average of previous years.

The most common countries of occurrence abroad were the United Kingdom, Germany, Switzerland and the United States. About a third of all reported incidents abroad occurred in the United Kingdom, while in 2023 the number was almost half.

Of the incidents that occurred abroad, five were classified as serious incidents. Three of these occurred in the UK (London and Manchester), and in all cases the other party was a drone. In addition, one serious incident occurred in Switzerland and one in Austria, both at uncontrolled airfields, when a Finnish small commercial air transport aircraft was approaching to land and had a near miss with local traffic.

Other situations that occurred abroad were typically related to near-miss situations with drones or, for example, to avoidance orders issued by the TCAS system, which reduce the risk of a potential collision. More on the topic of TCAS below.

## 8.2 General and recreational aviation

Finnish general and recreational aviation was involved in 18 near-miss incidents in 2024. The number was approximately at the average level for 2014–2023. All incidents occurred in Finland, which has been typical also in previous years. Near-miss incidents abroad have been reported mainly in Spain, where Finnish flight training takes place, but no such incidents were reported last year.

Three of the incidents were classified as serious incidents, and they occurred at uncontrolled aerodromes (Nummela and Räyskälä) or in uncontrolled airspace (Muhos near Oulu). This is in line with the average of previous years, as near-misses in general and recreational aviation lead to an average of three serious incidents per year. Finnish aircraft did not experience any near-misses or serious incidents abroad, which has been quite rare in the past.

In previous years, the most common locations for incidents have been Helsinki-Malmi, Pori, Hyvinkää, Lahti-Vesivehmaa and Nummela. After the closure of Malmi airport, traffic has mainly shifted to nearby uncontrolled airports, and an increase in traffic has been observed especially in Hyvinkää, Lahti-Vesivehmaa and Nummela. However, only isolated near-misses were reported at these airports last year. The majority of incidents occurred in Pori and Tampere-Pirkkala, where general aviation flight training activities are active. The majority of near-misses were related to general aviation.

At uncontrolled airports, where there is no air traffic control to direct traffic, the importance of proper situational awareness is emphasized. In the previous year, 2023, "be seen and be heard" was raised as a special theme in Finnish recreational aviation safety work. More information on the topic can be found, for example, in the presentation materials from that year's Lentoon! seminar .

The safety bulletins have also identified the most typical causes of near-miss situations and considered ways to prevent them. One of the most important safety factors is maintaining situational awareness. According to one safety bulletin:

*"The building blocks of situational awareness include trust that others will also act according to common rules, listening to and speaking on the airport radio frequency, and actively observing the airspace."*

## 8.3 Unmanned aviation

In 2024, four near-miss incidents involving drones with manned aviation were reported in Finland. The number was clearly below the average for 2014–2023 (approx. 8). The most typical incident was still the flying of a drone in the vicinity of Helsinki-Vantaa Airport at the same time as an aircraft was approaching the runway. However, none of these incidents caused a serious incident to manned aviation.

There was also one reported incident in 2024 where two drones collided during an electrical grid inspection flight. Such collisions between drones have been quite rare so far.

In Finland, the number of near-miss incidents caused by drones remained at a reasonable level last year. On the other hand, the number of incidents where drones were flown without permission in controlled airspace or other airspace requiring permission increased slightly. Unauthorized drone operations, especially near airports, are almost always intentional. A drone can cause serious damage when it collides with a manned aircraft, so every such incident is an unnecessary and safety-threatening situation. You can read about the situation with airspace infringements in its own section.

Finnish aircraft continue to experience significantly more near-misses with drones abroad than in Finland. Last year, 11 such incidents were reported, which was slightly fewer than the previous year, but still above the long-term average.

The majority of foreign incidents were reported from the UK, particularly around London. There were also individual reports from countries around the world. Three of these incidents were classified as serious incidents. All of the serious incidents occurred around London or Manchester, when a drone was flown without permission close to the approach path of a Finnish aircraft. London has been a "hot spot" for unauthorised drone activity in recent years.

## 8.4 Air traffic control

A total of 20 air traffic control-induced aircraft separation minima infringements (excluding wake turbulence or aircraft-to-airspace separation minima infringements) were reported in 2024. This was slightly above the average for 2014–2023.

In addition, there were a few reported incidents where aircraft, typically flying under visual flight rules, ended up too close to each other. In these cases, traffic reports from air traffic control were not always sufficient to prevent the situations.

The majority of the separation minima infringements occurred in the Helsinki-Vantaa Airport area, followed by Jyväskylä and Tampere-Pirkkala. However, the infringements were mostly minor and did not cause any significant consequences.

Near misses typically occurred during the approach phase of a flight. These situations were caused by a variety of factors, including weather conditions, errors in air traffic control, or flight crew actions that were not according to the clearance.

## 8.5 Types of incidents contributing to near misses

**Airspace infringements** are described in more detail in their own section In addition, other events to be monitored that may contribute to near misses include, for example, level busts, lateral deviations from the route, transponder failures, and incorrect responses to TCAS commands.

In 2024, 47 **level busts were reported in Finland**, which was largely in line with the average of previous years. Most of the incidents occurred in military aviation, where the numbers vary greatly from year to year. Last year, the number of reports increased from the previous year. Typically, military aircraft or aircraft

formations did not follow the clearance altitude when entering or leaving training areas.

In civil aviation, level busts were reported on average at the same level as in previous years (approximately 28). These cases mainly concerned commercial air transport or general aviation situations where clearance altitude was not adhered to during the en-route phase of the flight.

Abroad, 36 clearance altitude violations were reported for Finnish aircraft, which was clearly above the long-term average. The incidents were widely distributed across different European regions, and the reasons varied. The most common factors were, for example, a misheard call sign, a congested radio frequency, a misunderstood clearance or an incorrectly set altitude in the aircraft's system.

**138 lateral deviations from the route** were reported in Finland and for Finnish aircraft, which was clearly above the average for 2014–2023. In Finland, 95 cases were reported, almost double the average. The majority of cases were recorded at Helsinki Airport airspace, and secondly in the airspace controlled by the area control center. Although deviations increased, they did not cause significant consequences.

The number of deviations began to increase, especially since May. The reasons were often typical situations, such as incorrectly setting a waypoint in the aircraft's system or not following the final approach line as reported. In addition, more exceptional situations were reported related to the effects of the war in Ukraine, such as sudden changes of direction by Russian aircraft and weather avoidance maneuvers into Finnish airspace.

In addition, there were reports of cases where an aircraft encountered GPS interference during the enroute phase of the flight, and during the approach its heading deviated from the planned one. GPS interference typically affects the aircraft's navigational capabilities, requiring it to use backup navigation systems or request navigation assistance from air traffic control. Traficom has published more detailed information on the subject on the Satellite navigation interference in Finland website.

No significant increase in route deviations was observed abroad, and reports remained at the level of previous years. Individual cases due to GPS interference were reported, but the majority of deviations were due to other reasons.

There was no significant change in reports **of transponder failures or incorrect transponder code settings** last year compared to previous years. The numbers remained at the long-term average.

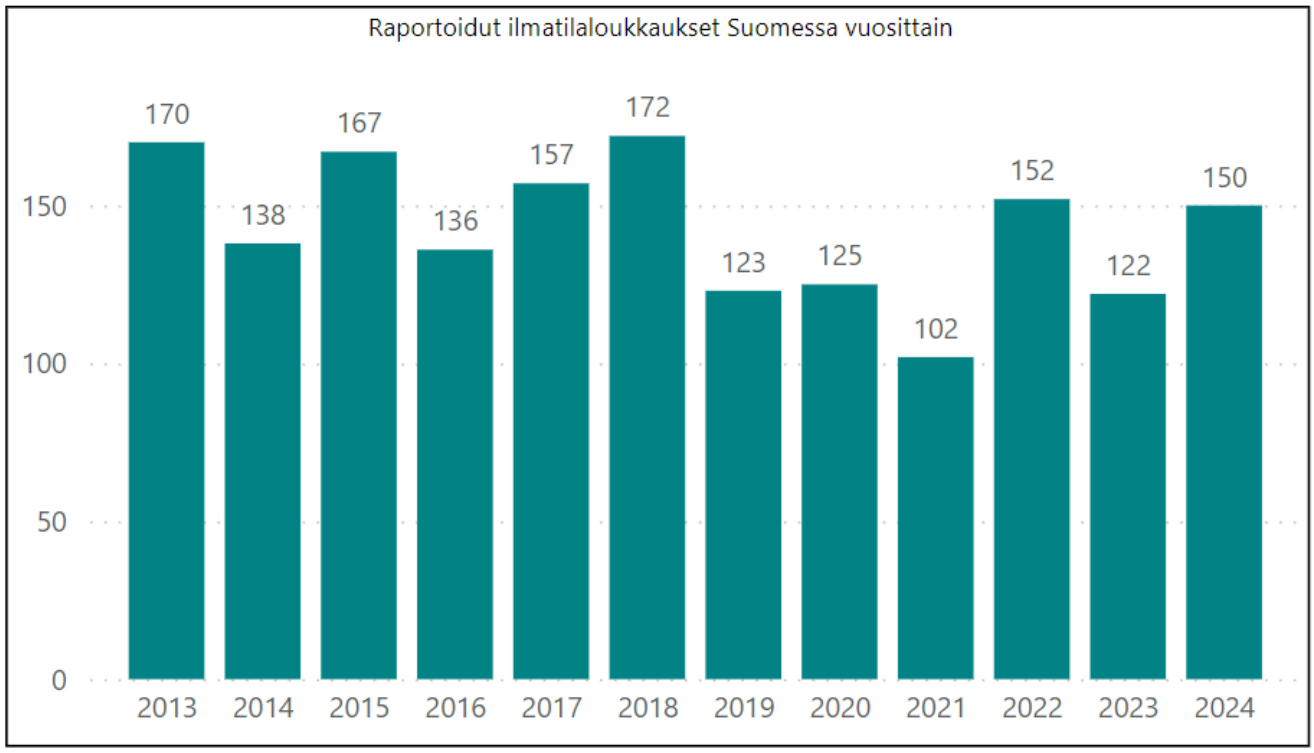
**Radio communication failures** were reported more than average, and the number also increased from the previous year, both in Finland and abroad. Typical situations included interference noises on radio frequencies, problems in contacting air traffic control, or selecting a wrong radio frequency. Several cases were reported in Finland in which a general or recreational aviation aircraft did not establish proper radio contact in airspace that required such. If air traffic control clearance is not obtained before flying into controlled airspace, this is an airspace infringement.

**27 reports of TCAS avoidance commands were received.** This was slightly above the long-term average. Most of the incidents occurred abroad. They often involved situations where an aircraft's large climb or descent rate activated another aircraft's TCAS system, but the required separation minimum was maintained.

**There was one report of incorrect reaction to a TCAS resolution advisory.** Such reports are very rare. In this case, the pilot quickly realized his mistake and corrected the situation without any safety implications.

## 8.6 Airspace infringements

In 2024, 150 airspace infringements were reported in Finland. The number was exactly on par with the average for 2014-2023. The number clearly increased compared to the previous year. There was no significant growth in any single area of aviation, but the number of infringements increased evenly in all areas.




### *8.6.1 Controlled airspace*

Last year, 113 airspace infringements of controlled airspace were reported in Finland, which was largely in line with the average of previous years. The incidents did not result in serious incidents. The majority of the violations (34) were in the airspace of Helsinki-Vantaa, where the number of violations was in line with the long-term average. The other most common targets were Tampere-Pirkkala (9), Oulu, Turku and Ivalo (7 each). Ivalo has risen in the statistics in recent years. Tampere-Pirkkala and Oulu have traditionally been at the top. In 2023, a large part of the violations in Ivalo were caused by drones, but last year their share was smaller.

General aviation caused the majority of infringements (45), and the number was slightly above the long-term average. Most violations were in the airspace of Helsinki-Vantaa, but the numbers remained at the average level. Infringements caused by recreational aviation remained at the long-term average level and were mostly in the airspace of Helsinki. 15 infringements caused by drones were reported, and they were mainly concentrated in the Helsinki area. The total number remained slightly lower than the previous year and did not deviate significantly from the average.

Typical causes of airspace infringements were navigation errors, which resulted in the aircraft entering the terminal area from the bottom or side. In connection with navigation errors, the pilot usually also failed to establish the required radio

contact with air traffic control. Last year, these deficiencies were reported more than in previous years. It is often difficult to assess whether the lack of radio contact was due to a mistake or the pilot's incorrect perception of his own position.

Pilots of manned aircraft are generally good at reporting airspace violations they cause. Drone pilots, on the other hand, rarely report them. Last year, however, there was one report in which the pilot admitted to accidentally flying a drone at an altitude of 120 meters in an area where the maximum permitted altitude without special permission was 50 meters. He stated that he had relied too much on the device's geo-restrictions. Situations like this can be easily avoided by checking the flight area restrictions, for example, in the Flyk application .

### *8.6.2 Prohibited areas*

Airspace infringements can target prohibited areas established around nuclear power plants, for example.

In 2024, one airspace infringement was reported to prohibited areas. In that case, a foreign aircraft had flown through the prohibited area of the Loviisa nuclear power plant.
In previous years, there have been incidents slightly less than 3 per year. The last couple of years have gone quite well.

### *8.6.3 Restricted areas*

Airspace infringements may target restricted areas established to protect aviation from dangerous activities, such as shootings or detonations.

In 2024, there were 24 unauthorized flights into restricted areas. The number was slightly below the average for 2014-2023, but higher than a few previous years. The most frequent flights were into restricted areas R113 Huovinrinne and R94 Hätilä. Huovinrinne has also been an area that has been frequently flown into in previous years.
Overall, the most unauthorized flights have been into the R64 Santahamina area outside Helsinki, but in the last few years the number of flights there has been zero.

### *8.6.4 Different airspaces and where to find more information about them*

Airspace infringements to controlled airspace, i.e. airspace where air traffic control services are provided, increase the risk of collision between aircraft.

Flying without permission into a Restricted area (R), where shooting, detonations or other activities dangerous to aviation are taking place, poses an obvious danger to an individual aircraft. The purpose of Prohibited areas (P), on the other hand, is to protect objects of national importance, such as government buildings and nuclear power plants.

In addition to restricted and prohibited areas, danger areas (D) may be published in situations where, for example, there is active aviation activity in the area, unmanned aviation beyond visual line of sight or other activities that are dangerous to other aviation. However, flights into danger areas may be permitted at the discretion of the aircraft commander without separate permission, so they do not restrict the use of airspace in the same way as restricted or prohibited areas. In

these cases, it is also recommended to find out the nature of the activity in the area before flying and to contact the party that reserved the area, if possible.

Prohibited areas are always active, while other airspaces, such as controlled airspace and restricted areas, are activated as needed. For example, controlled airspace is active when there is flight activity at an airport, and a restricted area is activated when an activity hazardous to aviation begins. Restricted and prohibited areas can be either temporary or permanent.

In addition, some airspaces have been designated as UAS airspace zones. These can be either prohibiting or restricting the operation of unmanned aircraft, or allowing, where operations carried out with unmanned aircraft are exempted from some of the requirements relating to them. These are specified in aviation regulation OPS M1-29 and its annexes.

In addition to the above areas, certain airspace areas have been designated as Radio Mandatory Zones (RMZ), where aircraft must be equipped with radio equipment and its use is mandatory. These areas are regulated in Aviation Regulation OPS M1-17.

Some areas are designated as Transponder Mandatory Zones (TMZ), where aircraft must be equipped with a pressure altitude transponder and its use is mandatory. These are regulated in Aviation Regulation OPS M1-31.

You can find all aviation regulations on Traficom's website .

Permanent restricted, prohibited and danger areas are published in Part ENR 5 of the Finnish Aviation Manual (AIP). Temporary areas, such as those established to protect police or rescue operations, may be published at short notice. Information on temporary areas can be found in NOTAM bulletins, which are available at https://www.ais.fi/bulletins/ .

The Flyk application displays active airspaces and information on activities hazardous to aviation from AIP, AIP Supplements, NOTAM bulletins and AUP/UUP plans (Airspace Use Plan). Flyk also displays various prohibited and restricted UAS airspace zones. However, the user must note that the Flyk map is only an informative tool and does not relieve the user of the responsibility to familiarize themselves with the necessary NOTAM and AUP/UUP information.

The European Action Plan for Airspace Infringement Risk Reduction (EAPAIRR) contains a comprehensive list of recommendations to reduce airspace infringements. The recommendations are targeted by groups to those parties that have an impact on airspace infringements (e.g. airspace users, air navigation service providers and aeronautical information and meteorological services). The plan was last updated in March 2022. Traficom encourages aviators and aviation organisations to familiarise themselves with the recommendations and good practices of the EAPAIRR and to implement them in their own operations to the extent practical. The plan can be found on the Eurocontrol website.

You can learn more about airspace violation data in an interactive report, which you can find **on the tieto.traficom.fi website** .

# 9 Loss of Control in Flight (LOC-I) 2024

In 2024, 14 incidents of loss of control of an aircraft during flight were reported. This was well below the 2014–2023 average (18.8) and was also lower than the previous year. The majority of incidents were related to drone operations, as in previous years.

**In manned aviation,** four losses of control were reported, which was below the long-term average (7.4). One of these occurred in recreational aviation and three in general aviation. Two resulted in an accident and two in a serious incident. Loss of control situations often lead to serious consequences, but the number of both accidents and incidents remained below the average last year.

No loss of control was reported in commercial air transport, which is typical, as such situations are rare in commercial operations.

Loss of control incidents are more common in general and recreational aviation, but last year four incidents were reported, which was slightly below the long-term average.
One incident was reported in recreational aviation, which was lower than the average number in previous years (2–3 incidents per year). This incident was classified as a serious incident, as the glider entered an unexpected spin but the pilot managed to regain control of the aircraft before an accident occurred.

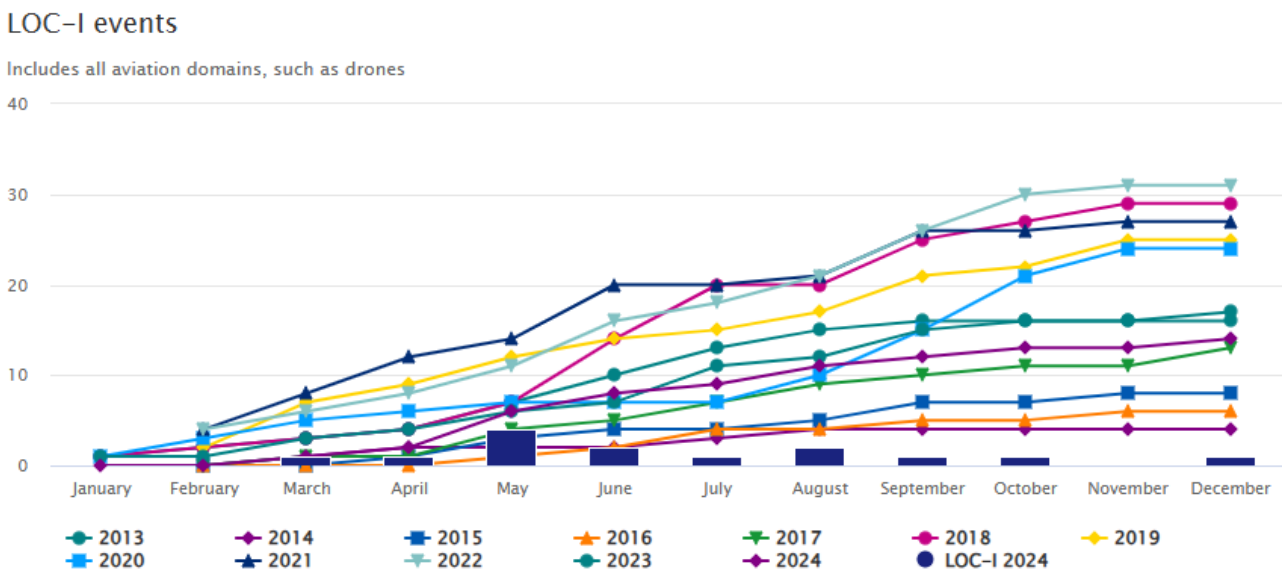
Three incidents were reported in general aviation, which was in line with the long-term average. Two of these resulted in an accident and one resulted in a serious incident.

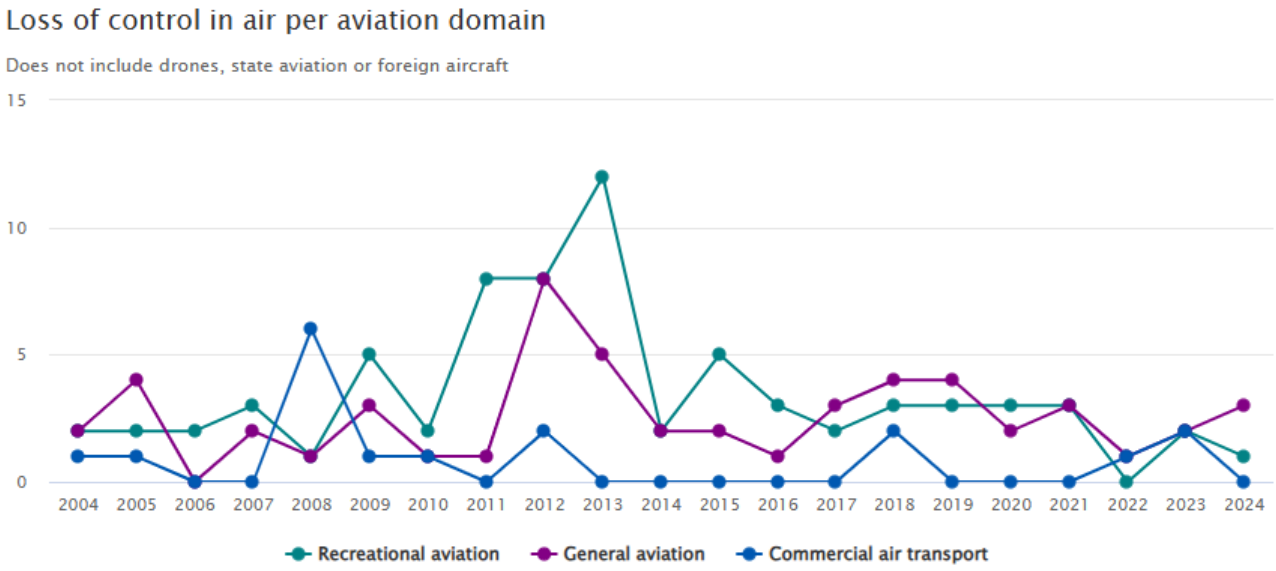
In the first accident, a general aviation aircraft crashed after takeoff at Räyskälä aerodrome, killing both occupants. OTKES has launched an investigation into the incident , and the causes will be determined once the investigation is complete. Based on preliminary information, it is estimated that the engine malfunction during takeoff led to loss of control.
In the second accident, a general aviation aircraft lost oil pressure in the engine during the flight, as a result of which the pilot made an emergency landing in a field. During the landing, the aircraft overturned on its roof through the nose and was severely damaged.

In the serious incident, a general aviation aircraft stalled during landing and suffered structural damage in the subsequent hard landing.

In terms of number of LOC-I incidents in general and recreational aviation, year 2024 was better than average. However, in loss of control type accidents, the impact energies are usually high, which easily leads to loss of life. This was unfortunately also the case last year.

**Drone operations** accounted for the majority of last year's reported losses of control, but the number remained below average and was approximately the same as the previous year. Typical causes were technical failures, such as propellers or batteries detaching during flight. Reporting practices in drone operations continue to vary, and clarifications on reporting criteria are expected from the European Aviation Safety Agency. Awareness of reporting requirements is currently variable among pilots, which contributes to the number of reported incidents.




## 9.1 Types of incidents contributing to LOC-I situations

In addition to the laser interference, bird strikes and fire & smoke observations incidents described in more detail below, other types of incidents that may contribute to the loss of aircraft control and that are monitored include, for example, aircraft speed limits being exceeded or exceeded, incidents caused by wake turbulence, deficiencies in de-icing and anti-icing, flight control system failures and different deviations related to aircraft loading, such as load placement contrary to loading instructions or errors in securing the load or in weight calculations.

**Flight control system failures** were reported at a higher than average rate, and the number of such incidents has been increasing slightly for several years. Such failures include, for example, flap and aileron malfunctions and speed or attitude sensor failures. The majority of incidents are reported in commercial air transport, with the most typical incident involving a flap system failure. Although these failures can affect aircraft controllability, they did not result in any significant incidents last year.

**De-icing and anti-icing** deficiencies were reported at an average rate. Ice accumulating on aircraft surfaces can significantly impair the aircraft's flight characteristics and, in the worst case, lead to loss of control. Last year, the reports mainly related to inadequate de-icing on commercial air transport aircraft. These did not result in any significant incidents. Traficom updated the 2024 winter operational bulletins, which comprehensively address icing prevention. The bulletins are available on Traficom's website in versions aimed at airlines and at general and recreational pilots .

Various **loading-** related deviations were reported somewhat more than average. These often involved cases where the cargo was placed in the hold contrary to what was specified in the loading instructions, or the cargo was not secured properly, for example, the cargo container was not properly locked, or the nets holding the cargo in place were not properly secured. These cases were observed particularly at Helsinki Airport when flights arrived in Finland. The actual error had therefore occurred abroad when the aircraft departing for Finland was loaded. Loading errors did not cause significant hazards, but can increase the risk of loss of control if the cargo shifts or the weight distribution changes.

There were also more reports than average of various **high speed and low speed events**. Exceeding aircraft's speed limits can cause strain on the aircraft's structures and affect, for example, the execution of an approach. Similarly, too low a speed can lead to the aircraft stalling. Underspeed is most often a more dangerous condition than overspeed. Almost all of last year's incidents concerned overspeeding situations. Most often, the aircraft involved were commercial air transport aircraft. The incidents did not cause any serious consequences. Typically, the specified speeds were exceeded either during the e route phase (most often weather phenomena contributed to the unexpected change in speed) or during the approach phase (weather phenomena also as one influencing factor, but also, for example, too early extension of the flaps by the crew).

**Weather phenomena** affected many reported incidents, and their share has been monitored for a long time. In 2024, the number of incidents related to weather phenomena increased again. From the beginning of 2024, special monitoring of incidents in which **significant turbulence was observed during the flight** began. One turbulence incident led to a serious incident on a small Finnish commercial aircraft, when a passenger was injured due to turbulence during the en route phase of the flight.

In addition, in August, OTKES began an investigation into a serious incident that occurred on a Norwegian airline flight from Rhodes to Helsinki on 11 August 2024, in which two cabin crew members were injured after the aircraft flew into turbulent airflow.

Injuries caused by turbulence also occur in the cabin of Finnish aircraft every year, but they are typically not very serious. Turbulence usually causes problems during the enroute phase, when seat belts are not necessarily used in the cabin. Turbulence cannot always be detected in advance (for example, CAT or Clear Air Turbulence), so it is wise to always keep your seatbelt fastened when sitting in the cabin.

During the approach and landing phase of the flight, everyone has their seatbelts

on, and then unexpected changes in wind direction or speed can cause unstable approaches, for example. In some cases, the conditions can be so bad that the aircraft has to fly to an alternate airport. Last year, there were more such cases than average. It is safer to make such a decision than to try to land despite the conditions.

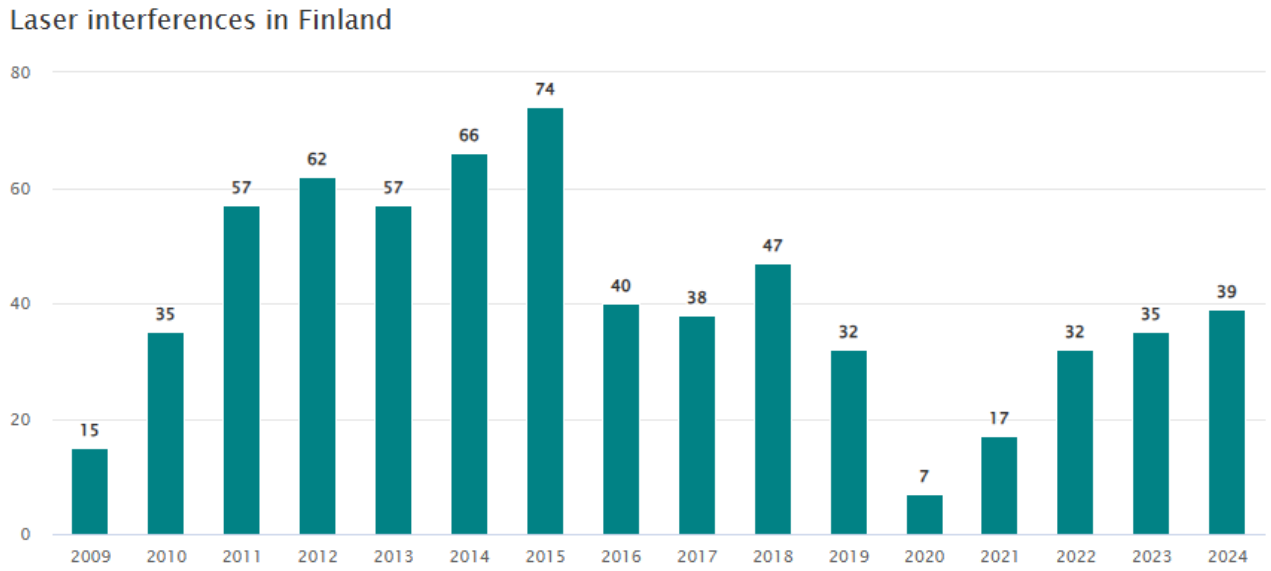
**Technical failures in aircraft** can lead to a variety of consequences, loss of control being one of them. One indicator to monitor is the number of technical failures that lead to flight cancellation or diversion. The number of such incidents has been on a slight decline since 2019. Last year, the number remained at the average for the years 2014-2023 (approx. 120).
In commercial air transport in particular, there are precise criteria for the condition of aircraft systems. If these are not met, the flight must be cancelled or aborted. In commercial air transport, the number of such failures that led to flight cancellations was at the average level. 3 incidents were classified as serious incidents, and they involved smoke observations that were caused by a failure of the aircraft's technical system.
The numbers in general and recreational aviation were also at the average level. 2 of them led to an accident and 5 to serious incidents. These figures were approximately at the level of longer-term averages.

## 9.2 Laser interference

Laser interference of aircraft and helicopters is a constant risk factor in air traffic. Laser beams can impair vision during critical phases of flight, such as takeoff and landing, or when flying at low altitude. Laser pointers make it difficult for pilots to concentrate and cause visual disturbances, such as temporary blindness, blurred vision, or even permanent damage to the retina.

A total of 58 laser interference incidents were reported in 2024, of which 39 occurred in Finland and 19 abroad. Previous year the total was 77 (35 in Finland and 42 abroad), which was a record number. Last year's total figure was lower, but it was still above the 2014–2023 average (45.7).

In Finland, the number of laser incidents increased slightly from the previous year and the long-term average (28), continuing the upward trend that began in 2021. However, the numbers have remained at pre-COVID-19 levels and have not risen as high as in 2011–2015.




The area around Helsinki-Vantaa Airport has traditionally been the most common target of laser interference, and this was also the case last year. Approximately 75% of all reported interferences in Finland occurred in this area, and Helsinki's share of all incidents has been continuously increasing in recent years. Only isolated incidents have been reported from other airports. Autumn has been the most typical season for interference, and last year more than half of the incidents occurred between September and November. The interference most often occurred in the evening, when the aircraft was approaching for landing. Last year's incidents were resolved without any serious consequences, but pointing a laser is extremely dangerous, especially during the approach phase.

The number of incidents reported from abroad (19) was in line with the long-term average. The number of incidents reported from abroad in the previous year was double the average. No clear "hot spot" was identified last year, while in the previous year, incidents were particularly prevalent around London.

Laser interference is a crime. Directing a laser beam at an aircraft crew is punishable in itself, even if it does not result in any concrete danger or damage to the aircraft, its crew or passengers. Airlines will generally file a criminal report in cases of harassment, and Traficom may also request an investigation from the police.

The first court sentence for laser interference was handed down in 2018, when the Lapland District Court sentenced a man to a fine for pointing at a medical helicopter with a powerful laser. In its judgment, the Court found the man guilty of causing a serious traffic hazard and that his interference had caused a danger to aviation safety. Currently in progress is a pre-trial investigation by the police into a case of interference with a general aviation aircraft in Hyvinkää in September 2022.

FinnHEMS, the Finnish Defence Forces, the Border Guard, the Finnish Pilots' Association, the Radiation and Nuclear Safety Authority STUK and Traficom launched **the "Laser is not a toy" campaign in March 2021** , drawing attention to the serious consequences of laser interference for air traffic.

In September 2019, Traficom published **a safety bulletin on laser interference** , which reminded pilots of the dangers of laser interference and also provided instructions for pilots in the event of a laser interference situation. The bulletin also reported on the first court ruling on laser interference.

Pointing with a laser is punishable by law

Handheld laser pointers are cheap and easily available, which means that many people see them as toys. In Finland, the maximum permitted output of an individual laser pointer is one milliwatt. Audiovisual equipment may have a laser pointer with five milliwatts of power at maximum. If such a pointer has a green beam, it may interfere with pilots at a distance of up to three kilometres. If the laser has 125 mW of power, the interference may reach up to 18 kilometres. Eyes are clearly more sensitive to green light than red or blue light.

Pointing the beam of a laser pointer at the flight crew of an aircraft is punishable in itself, even if it did not cause any actual damage or real danger to the aircraft, its crew or the passengers.

If e.g. the beam actually hits the eyes of the flight crew during a critical stage of the flight, i.e. takeoff or landing so that the pilot is blinded or even loses their eyesight partially, the dangerous situation is real and serious. This may constitute an offence called “causing danger” or, in certain situations, “criminal traffic mischief” or “negligent endangerment.”

If the use of a laser pointer causes real damage, the situation will naturally be assessed in a completely different manner. In that case, all the provisions of the Criminal Code that safeguard the life and health of people apply, such as the provisions on negligent bodily injury and homicide. Naturally, the party causing the damage would also be liable for the considerable financial damage.

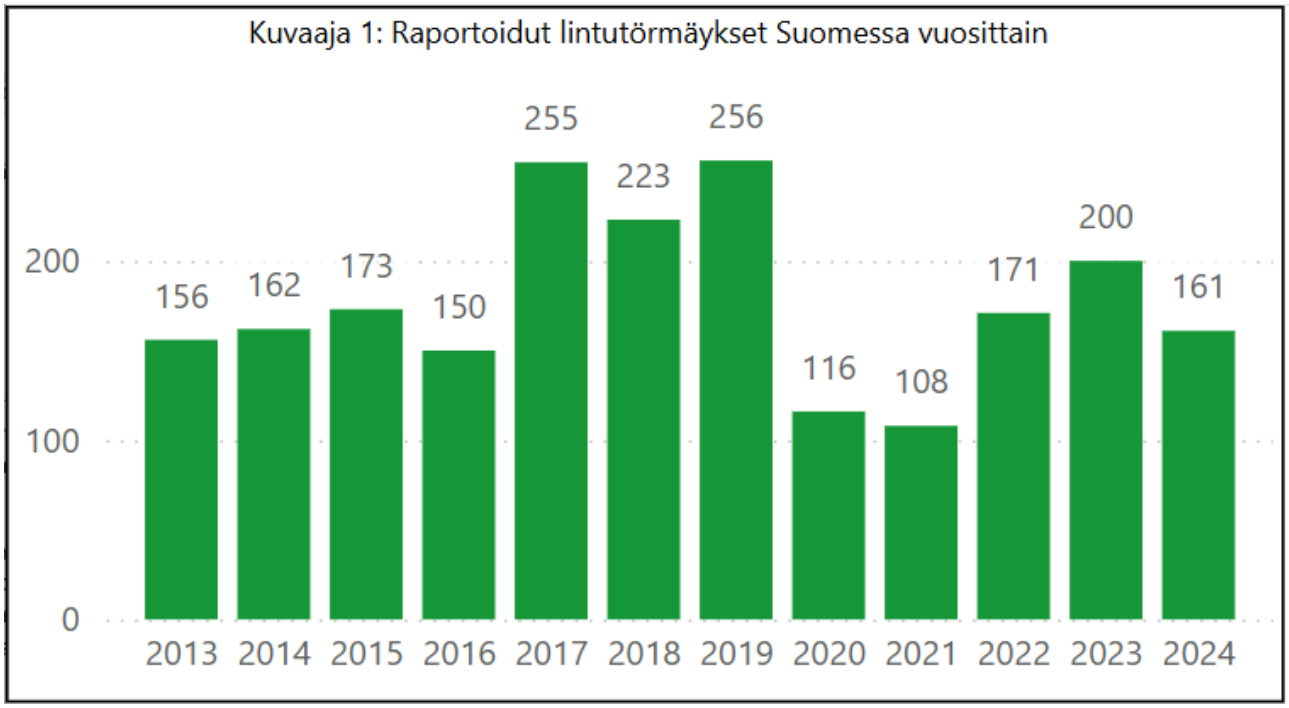
**From the Tieto.traficom website** You can find more information about legislation related to laser interference.

## 9.3 Bird strikes

A bird strike is a collision between an aircraft and a flying animal, most often a bird, but sometimes also a bat. Although most bird strikes do not affect the flight or cause a dangerous situation, in the worst case, a collision can lead to loss of control of the aircraft.

Bird strikes are estimated to cost approximately one billion euros annually around the world, including aircraft damage, repair costs and operational delays. Climate change has seen new bird species move further north, which may increase the risk of bird strikes in the future. In addition, as aircraft become quieter and faster, the ability to detect and avoid birds may be reduced. Bird strike reporting has also improved in recent years, which may contribute to the number of cases detected.

A total of 298 bird strikes were reported in Finland or to Finnish aircraft in 2024. The total number was in line with the long-term average and was slightly lower than the previous year. 161 strikes were reported in Finland, which was slightly below the 2014–2023 average (172.5). 138 incidents were reported abroad, which was above the average (109).




In 2024, the number of bird strikes in Finland decreased slightly from the previous year. More than half of the incidents occurred at Helsinki Airport, which has also been typical in previous years. The next highest number of collisions was reported at Tampere-Pirkkala and Kuopio, of which Kuopio in particular has traditionally been at the top. Relative to the number of operations, the number of bird strikes at Helsinki Airport was at the same level as at other airports.

Most bird strikes do not cause significant incidents, and no such incidents were reported last year. Last year, one incident at Helsinki Airport was classified as a serious incident when several birds hit a commercial aircraft and its engines

during takeoff. The pilots reduced the power of the other engine and successfully landed back at the airport.

The number of bird strikes abroad remained at about the same level as the previous year. Collisions occurred evenly across the world, but most frequently in Germany, Spain, Italy and Poland. These countries have been common locations for collisions in previous years, although Poland has not previously ranked at the top.

According to statistics, in 2013–2023, bird strikes in Finland occurred most frequently in July and August, especially between 7 and 8 a.m. More than half of the strikes occurred during approach or landing, and most often the aircraft was hit by a small bird. The exact species of bird is not usually reported, but most often it was a swallow or a seagull. The statistics for 2024 on the times and species of strikes were also quite similar to previous years.

You can explore bird strike data in more detail with an interactive report, which you can find **on the tieto.traficom.fi website.**

## 9.4 Fires and smoke observations on aircraft

One of the indicators of loss of control of aircraft monitored by Traficom is fires and smoke observations on aircraft. A fire on an aircraft is a serious situation that, if it occurs in the air, can quickly lead to loss of control of the aircraft and, in the worst case, its destruction.

A total of 18 smoke observations or fires on aircraft were reported in 2024. The majority of incidents occurred in commercial air transport, as has been typical in previous years. However, more incidents were reported in commercial air transport than the average for 2014–2023.

Three incidents were classified as serious incidents, slightly more than in previous years. In two cases, smoke was observed in the cabin during the flight, which resulted in the flight being aborted and the aircraft landing at the nearest suitable airport. In the third case, smoke began to form during the aircraft taxiing, leading to the evacuation of passengers. In all of these cases, the smoke was apparently caused by overheating of systems. No significant fires occurred in these cases.

In general and recreational aviation, six smoke observations and fires were reported, which was also above the long-term average. Of these, two resulted in accidents and two in serious incidents.

One of the accidents occurred in recreational aviation when smoke was observed in the cockpit of an ultralight aircraft, which made a forced landing and rolled over and was damaged. The other accident occurred in general aviation when an aircraft engine caught fire during start-up, severely damaging the aircraft. Such fire situations that result in accidents have been very rare.

Serious incidents occurred in general aviation. In one case, an engine caught fire during start-up, but the fire was extinguished. In another case, smoke entered the cockpit during take-off, and the plane had to return to land.

In addition, two smoke observations occurred in foreign commercial air transport in Finnish territory, one of which was classified as a serious incident. In that case,

an airliner engine had leaked oil on the apron, and the hot engine ignited it. The crew started the engine, which caused the air flow to extinguish the fire.

Last year, passenger smoking on Finnish aircraft did not cause any serious incidents, but slightly more incidents were reported than average. These incidents also included the use of e-cigarettes. The year before last, one incident of smoking led to a fire in the aircraft's toilets, but fortunately the fire was quickly extinguished.

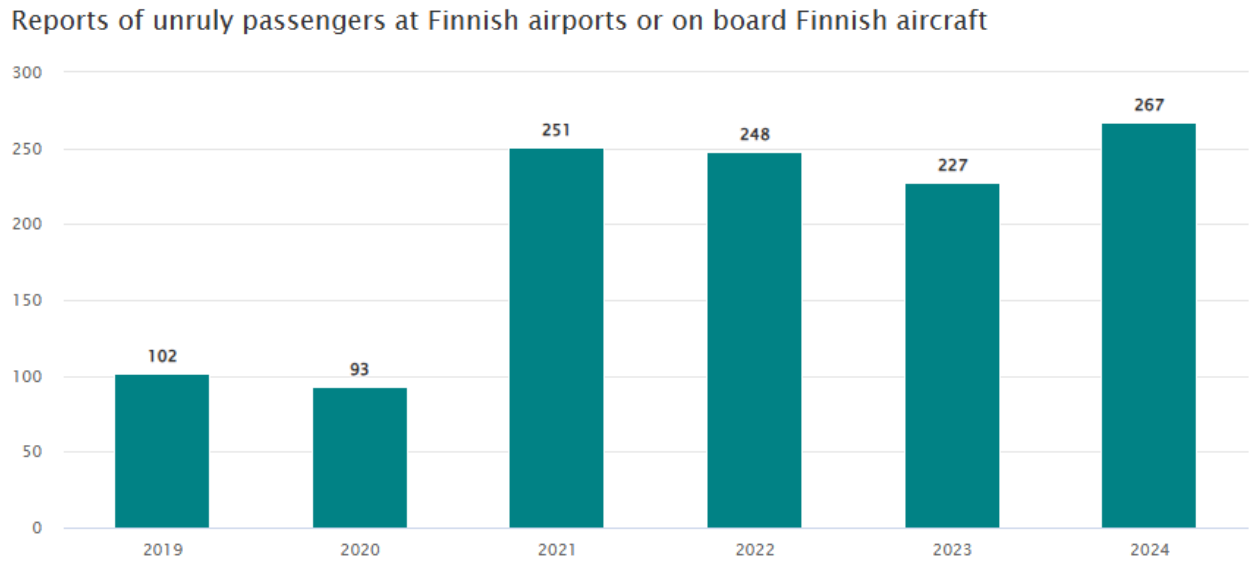
Traficom published **a press release in October 2023** regarding unruly passengers. One form of such behavior is also smoking on the plane. More about disruptive passengers in the next section 9.5.

## 9.5 Unruly passengers

The International Civil Aviation Organisation ICAO defines an unruly passenger as *"A passenger who fails to respect the rules of conduct at an airport or on board an aircraft or to follow the instructions of the airport staff or crew members and thereby disturbs the good order and discipline at an airport or on board the aircraft."*

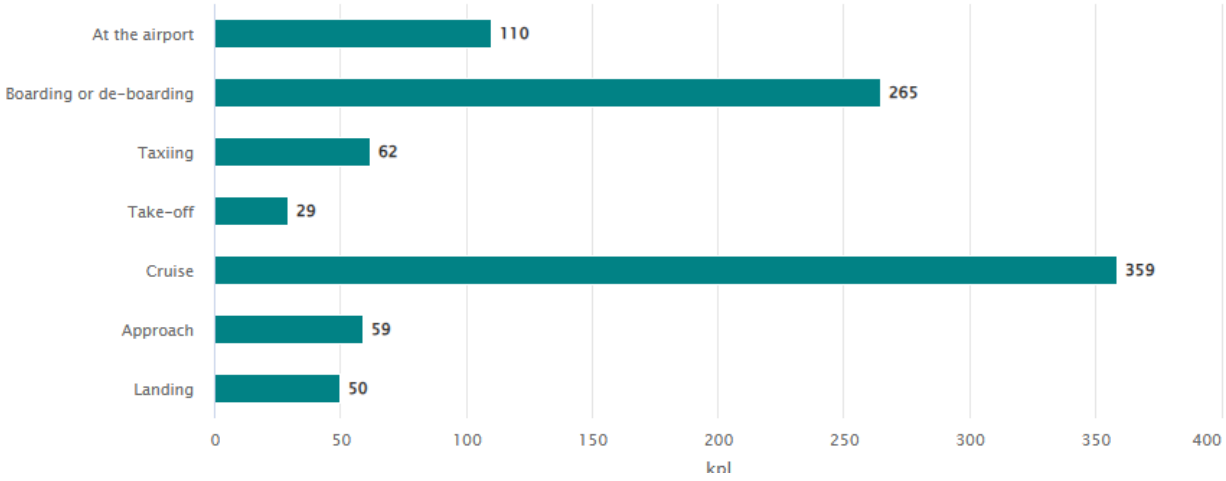
In this review, as regards to airports, unruly passengers refer to persons who are arriving or departing at the airport as passengers, not, for example, persons who have come to the airport to escort a passenger or who are otherwise randomly present at the airport.

In 2024, 267 cases were reported in which a passenger had behaved in a disruptive manner at a Finnish airport or on a Finnish aircraft. The number increased by almost 20% compared to the previous year. A total of 84 such cases were reported in the last quarter of the year . The average for the years 2019-2023 during the same period was 38 cases, i.e. the number was more than double the average.



Last year, most incidents occurred during the enroute phase of the flight. This was also the most typical phase in previous years. In these situations, the passenger had, for example, behaved in a threatening or disruptive manner or was significantly intoxicated. Disruptions caused by drunkenness in particular continued to increase during the year. Drunkenness combined with failure to follow the crew's instructions is a safety risk for both the person concerned and others on board.

Unruly passengers per flight phase, 2019–2023




The vast majority of incidents at Finnish airports occurred at Helsinki Airport, as it is also clearly the busiest airport in terms of passenger numbers.

Event types

Disruptive behavior during flight can be divided into three typical manifestations:

1. The largest group of these is disruptive behavior (verbal harassment, excessive intoxication, smoking). A total of 150 cases of this type were reported in 2024.

2. Another significant type of incident is failure to follow instructions given by the crew (ignoring the seatbelt warning light, failing to follow given safety instructions and orders, tampering with safety equipment). A total of 107 such incidents were reported in 2024.

3. The most serious manifestation is physical violence. A total of 10 such cases were reported in 2024.

Smoking in aircraft toilets is also a risk factor for a fire on board the aircraft, the consequences of which can be very serious and, in the worst case, lead to loss of control of the aircraft. The development of these cases has been discussed in more detail in the section on fires and smoke observations.

At airports, a typical situation was related to intoxication or verbal harassment. For example, jokes about bombs are always taken seriously in aviation and the situation is always treated as a real threat. The result of such speech is most often denial of boarding and the police being called (removal from the airport and

possibly a fine). The threat of violence has also unfortunately increased during 2024.

Passengers should remember that at the airport and on the plane, they are the only ones responsible for their own behavior and its possible consequences. Disruptive behavior cannot and will not be tolerated.

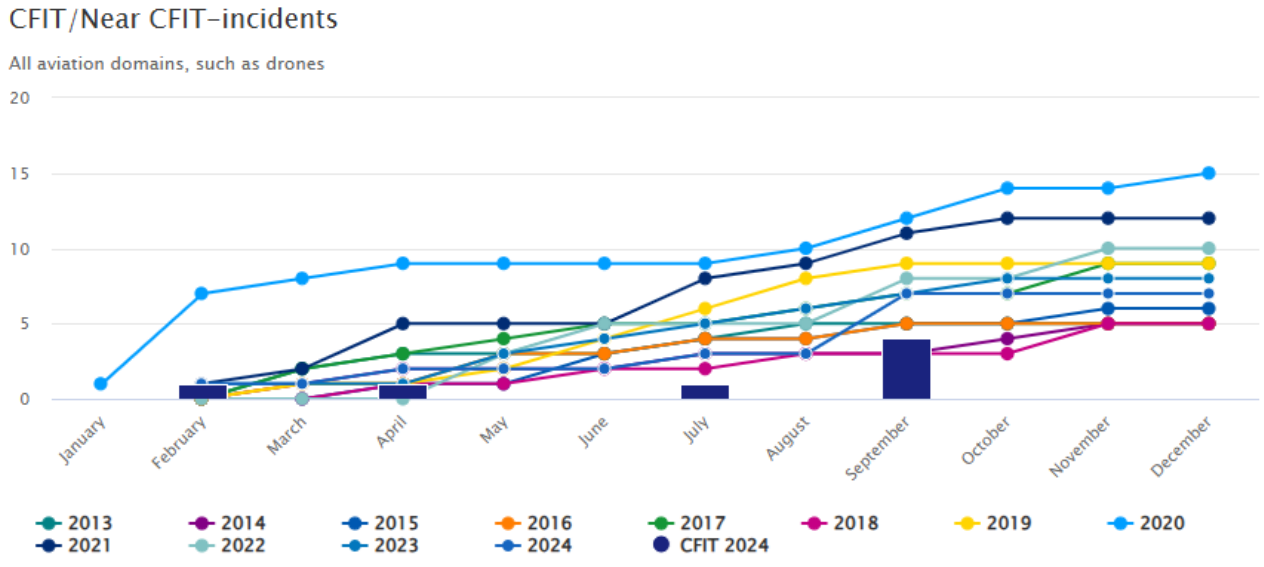
# 10 Controlled flight into terrain and near-miss situations (CFIT/near-CFIT) 2024

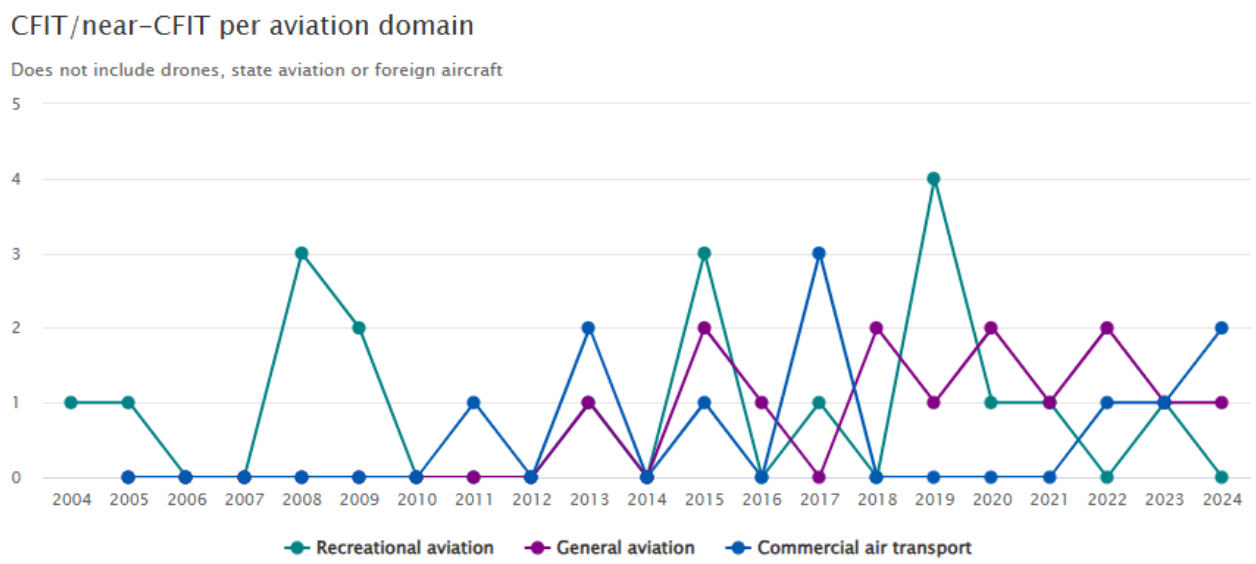
Seven CFIT (Controlled Flight Into Terrain) or "near-CFIT" incidents were reported in 2024, in which an aircraft under pilot control collided with terrain or an obstacle or had a near miss. The number was largely at the level of the 2014–2023 average (8.9). Three of the incidents occurred in manned aviation and four in drone operations.

In manned aviation, the number of incidents was about half the long-term average. One incident was classified as a serious incident when the blades of a medical helicopter hit a tree branch during takeoff, causing minor damage. However, more serious consequences were avoided. In previous years, CFIT incidents have resulted in an average of one accident and one serious incident per year, so last year was statistically slightly better than average.

The previous year, there was one fatal CFIT-type accident when a general aviation aircraft performing aerobatic flight in Selänpää aerodrome crashed into the ground, killing the pilot. OTKES published an investigation report into the incident in June 2024. According to the investigation, the pilot initiated a flat spin too low and corrective action was taken too late to prevent the accident.

In drone operations, CFIT incidents were reported at the same level as in previous years. Typically, they involved collisions with trees, masts or terrain, which is in line with reports from previous years.






## 10.1 Types of incidents contributing to CFIT situations

Factors contributing to CFIT situations are closely monitored, and these include incorrect altimeter pressure settings, incomplete obstacle information, and errors and ambiguities in aeronautical charts. Additionally, warnings from aircraft ground warning systems (GPWS) are an indicator to monitor.

Last year, there were more than average reports **of deficiencies in aeronautical chart** data. The errors detected concerned a wide range of issues, such as lateral or vertical boundaries of certain areas, incorrect location of airspace areas, inaccuracies in radio frequencies marked on maps, and problems with map readability. The reports were not limited to Finnish maps, but were also made about aeronautical charts from other countries. Although the incidents did not cause serious consequences, they provide valuable information for improving the quality of maps.

**Reports on obstacle information deficiencies** was also above average, although the number of reports decreased slightly from the previous year. Typical cases were flight obstacles without the required obstacle lights and cranes raised without permission in the vicinity of airports. On 1 October 2023, the maintenance of the flight obstacle register and the processing of statements related to flight obstacles were transferred to Traficom. At the end of 2023 and further during the last year, several reports were received related to this process, which kept the total number above average. You can find a lot of additional information on flight obstacles on Traficom's website .

The number of reports **of incorrect altimeter pressure settings remained at the average level.** In Finland, such incidents have been reported on average about ten times a year. The European Aviation Safety Agency (EASA) has identified the topic as a growing risk, and in a press release published on 9 March 2023 , it highlighted the risks caused by incorrect pressure settings and gave recommendations for reducing them. Incorrect pressure settings can lead to clearance altitudes being exceeded or undershot, which can increase the risk of near misses in the air. Incorrect pressure settings during the approach phase can lead to the

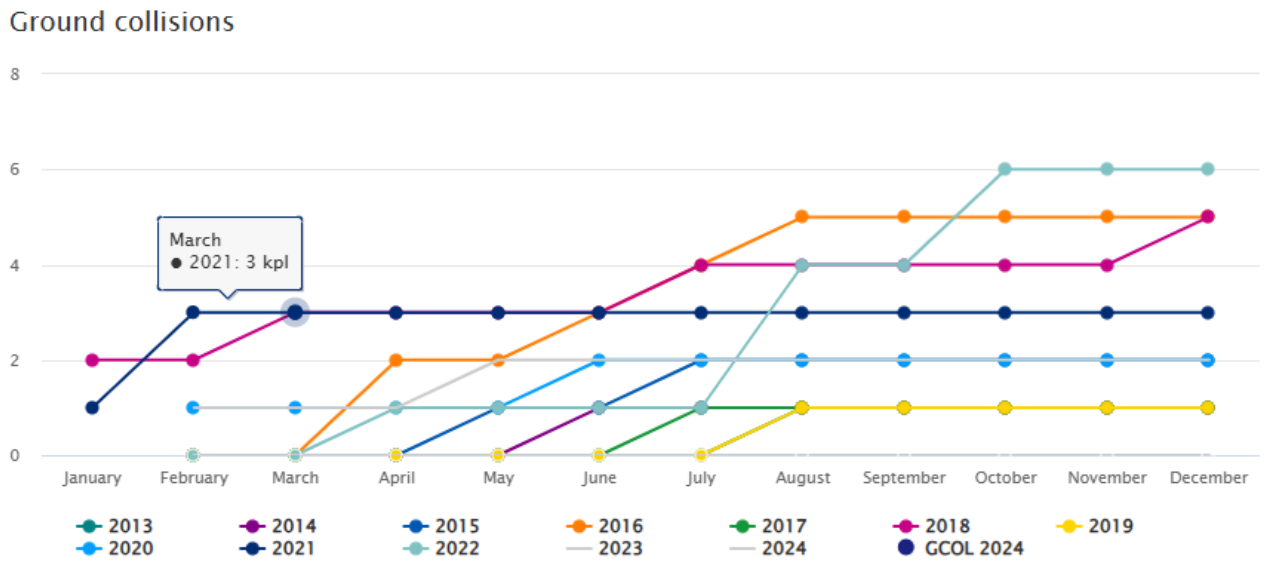
approach being performed either too high or too low, which can cause a CFIT situation.

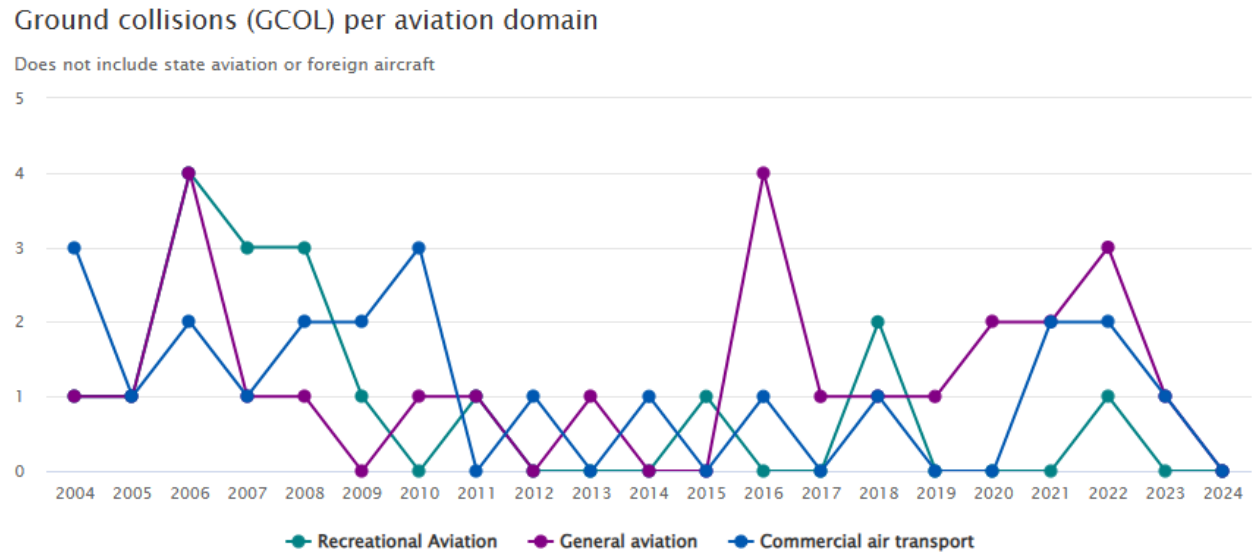
Last year, there were more than average **reports of warnings from the aircraft's terrain warning system, GPWS** , but almost all of them were false alarms. The most common cause of false alarms was GPS interference experienced during the flight, which affected the aircraft's systems' position information. If there was interference in the vertical information, it could have caused an unnecessary GPWS warning.

# 11 Collisions while taxiing to or from the runway (GCOL) 2024

No GCOL incidents, i.e., a situation where an aircraft collided while taxiing or air taxiing, were reported in 2024. Between 2014 and 2023, there were an average of 3 such incidents, so last year was exceptionally good in this regard.

Incidents in previous years have typically involved, for example, impacts with airport signs or other structures.




## 11.1 Types of incidents contributing to GCOL situations

Factors contributing to GCOL situations are closely monitored and include, among others, interference with aircraft pushback or taxi, inadequate apron control, damage during ground handling, and FOD (Foreign Object Debris) in the traffic

area and apron. In addition, reports related to the condition of the apron and taxiways are monitored.

**Reports about inadequate apron surveillance** included, for example, situations where passengers were allowed to move at the airport apron outside of defined areas or without the required surveillance. This can cause a safety risk, such as passenger injury, but fortunately this was avoided last year. In 2024, the number of inadequate apron surveillance incidents was still clearly above average, as in the previous year. Approximately 75% of the incidents reported in Finland occurred at Helsinki Airport, but Helsinki's share of all incidents decreased slightly from the previous year. At the same time, more incidents were reported from airports in Northern Finland, such as Rovaniemi, Ivalo and Kittilä.

**Interference of aircraft pushback and taxi** was higher than average overall. In Finland, the numbers remained at the average level, but the number of incidents reported abroad increased. In Finland, incidents occurred mainly at Helsinki-Vantaa and to a lesser extent in Rovaniemi. Abroad, incidents were reported evenly from different parts of Europe without a clear concentration at certain airports.
In typical situations, a ground vehicle drove either in front of a taxiing aircraft or behind the aircraft being pushed, which led to the taxiing or pushing being interrupted. In order to ensure flight safety, airports have a basic rule according to which ground vehicles must always give way to an aircraft when its warning lights are on. Last year's incidents did not lead to any serious consequences.

**Reports related to the condition of the apron and taxiways** were slightly above average, but the numbers were at the previous year's level. The reports mainly concerned the slippery condition of the apron and taxiways at airports, so the number of incidents remained low outside the winter season. Most of the reports were made in January-February and November-December, and the incidents were concentrated in particular at Helsinki Airport and partly in Rovaniemi. Slippery aprons can make it difficult for aircraft to move and increase the risk of collision. Slippery walkways also pose a risk of falling over for passengers. In 2022, the number of reports about slippery areas was significantly higher, as a result of which Traficom requested a clarification from Helsinki Airport about the situation and the planned remedial measures. Since then, the situation has improved somewhat.

**Reports of aircraft refueling-related incidents** were reported more than average, and their number increased both in Finland and abroad. The incidents did not cause significant hazards, most often involving inadequate compliance with refueling procedures. In particular, incidents were reported where the required two-way communication link between refueling personnel and flight crew was missing. This is especially important in situations where passengers are on board during refueling or are transferring to or from the aircraft.

# 12 Aviation safety situation monitoring 2024

ON MONITORING THE AVIATION SAFETY SITUATION

In addition to high-level (level 1; accidents, serious incidents and fatalities) indicators, the safety situation is monitored using various lower level (level 2 and 3) indicators that monitor the development of operational risk factors.

Level 2 indicators include the most significant causal factors of accidents (for example runway excursions, near misses and loss of aircraft control in the air), and level 3 measures the causal or contributing factors of these or other incidents that pose a threat of accident or incident.

The indicators and targets used to monitor the state of aviation safety are based on the indicators and targets defined in the Finnish Aviation Safety Programme (FASP). A more detailed description of them can be found **in Annex 2 of the Finnish Aviation Safety Programme** .

The safety situation is monitored in particular from the perspective of commercial air transport, general and recreational aviation, air navigation and aerodromes. This publication does not cover hang gliding, paragliding or parachuting.

Definitions of abbreviations and concepts used in the publication can be found in the last section of the review.

| **Aviation safety situation monitoring table - operational level 1 (top level) indicators**<br>**Indicator** | **Target** | **Situation assessment** | **Situation assessment based on historical and current situation** |
|---|---|---|---|
| **Commercial air transport:**<br>SPI 1.1: Number of accidents<br>SPI 1.2.: Number of fatal accidents<br>SPI 1.3.: Number of fatalities<br>SPI 1.4: Number of serious incidents | **Commercial air transport:**<br>SPI 1.1: no accidents<br>SPI 1.2: no fatal accidents<br>SPI 1.3: no fatalities<br>SPI 1.4: decreasing number of serious incidents in relation to traffic volume (five-year average) | GREEN | SPI 1.1. Q1-Q4/2024: 2 accidents in Finnish commercial air transport. The target (no accidents in commercial air transport) was not achieved.<br>SPI 1.2 & SPI 1.3 Q1-Q4/2024: No fatal accidents, so the targets (no fatal accidents and no deaths in aviation accidents) were achieved.<br>SPI 1.4 Q1-Q4/2024: 14 serious incidents, clearly above average. The collection of flight hour statistics for 2024 is ongoing, so the situation relative to traffic volume will be confirmed |

| Aviation safety situation monitoring table - operational level 1 (top level) indicators<br>Indicator | Target | Situation assessment | Situation assessment based on historical and current situation |
|---|---|---|---|
| | | | during spring 2025. Based on the preliminary assessment, the target (decreasing number of serious incidents relative to traffic volume, 5-year average) will not be achieved. The target was achieved in 2022 and 2023.<br><br>The situation assessment is considered green despite two accidents, which were quite exceptional in terms of type of incident. The development trend is considered negative due to, among other things, the risks posed by drone operations and the conflict in Ukraine. |
| **General and recreational aviation:**<br>SPI 1.1: Number of accidents<br>SPI 1.2.: Number of fatal accidents<br>SPI 1.3.: Number of fatalities SPI 1.4: Number of serious incidents | **General and recreational aviation:**<br>**General and recreational aviation:**<br>SPI 1.1: ≤ 10 accidents/100,000 flight hours (five-year average)<br>SPI 1.2: ≤ 0.6 fatal accidents/100,000 flight hours<br>(five-year average)<br>SPI 1.3: maximum 2 fatalities/100,000 flight hours (five-year average)<br>SPI 1.4: decreasing number of serious incidents in relation to traffic volume (five-year average) | YELLOW | SPI 1.1 Q1-Q4/2024: 6 accidents in Finnish general and recreational aviation. Below the number of previous years.<br>The collection of flight hour statistics for 2024 is ongoing, so the situation for 2024 will be confirmed during spring 2025. Based on the preliminary assessment, the target (less than 10 accidents/100,000 flight hours, 5-year average) will be achieved.<br>The target was achieved in 2023.<br><br>SPI 1.2 Q1-Q4/2024: 1 fatal accident. The number is below |

| Aviation safety situation monitoring table - operational level 1 (top level) indicators<br>Indicator | Target | Situation assessment | Situation assessment based on historical and current situation |
|---|---|---|---|
| | | | the average of previous years.<br>The collection of flight hour statistics for 2024 is ongoing, so the situation for 2024 will be confirmed during spring 2025. Based on a preliminary assessment, the target (less than 0.6 fatal accidents / 100,000 flight hours, 5-year average) will not be achieved. The target has not been achieved so far.<br><br>SPI 1.3 Q1-Q4/2024: 1 fatal accident, in which 1 person died. Below the long-term average.<br>The collection of flight hour statistics for 2024 is ongoing, so the situation for 2024 will be confirmed during spring 2025. Based on the preliminary assessment, the target (maximum 2 deaths per 100,000 flight hours, as a five-year average) will be achieved.<br>The target has been achieved every year from 2020 onwards.<br><br>SPI 1.4 Q1-Q4/2024: There were 22 serious incidents, somewhat more than the previous, longer-term average . The collection of flight hour statistics<br>for 2024 is ongoing, so the situation for |

| Aviation safety situation monitoring table - operational level 1 (top level) indicators<br>Indicator | Target | Situation assessment | Situation assessment based on historical and current situation |
|---|---|---|---|
| | | | 2024 will be confirmed during spring 2025. Based on the preliminary assessment, the target (decreasing number of incidents in proportion to traffic volume, 5-year average) will not be achieved. The target was achieved in 2023.<br><br>The situation assessment is considered yellow. The development trend is considered positive. Despite the fatal accident, the situation in general and recreational aviation is showing a good development trend in terms of safety. |

| Aviation safety monitoring table - operational level 2 (most typical causal factors of accidents) indicators<br>Indicator | Target | Situation assessment | Situation assessment of the historical and current situation by. |
|---|---|---|---|
| **SPI 2.1: Number of runway excursions (RE)** | **Commercial air transport:**<br>SPI 2.1: no numerical target.<br>The situation assessment is based on the development of the absolute and proportional number of incidents. | GREEN | Q1-Q4/2024: no runway excursions in Finnish commercial air transport.<br><br>The situation assessment is considered green. The development direction is considered neutral. |
| **SPI 2.1: Number of runway excursions (RE)** | **General and recreational aviation:**<br>SPI 2.1: no numerical target.<br>The situation assessment is based on the development of the absolute and proportional number of incidents. | GREEN | Q1/-Q4/2024: 10 runway excursions in general and recreational aviation. Number above the longer-term average.<br><br>The situation assessment is kept green. No accidents were caused by runway excursions, which was exceptional. However, the trend is changed from neutral to negative. |
| **SPI 2.2: Number of runway incursions (RI-VAP)** | **Commercial air transport:**<br>SPI 2.2: no numerical target.<br>The situation assessment is based on the development of the absolute and proportional number of incidents. | GREEN | Q1-Q4/2024: 7 runway incursions (All in Finland) in Finnish commercial air transport, a number above the longer-term average. A relatively large number in helicopter operations.<br><br>The situation assessment is considered green. |

| Aviation safety monitoring table - operational level 2 (most typical causal factors of accidents) indicators<br>Indicator | Target | Situation assessment | Situation assessment of the historical and current situation<br>by. |
|---|---|---|---|
| | | | The development direction is considered neutral. |
| **SPI 2.2: Number of runway incursions (RI-VAP)** | **General and recreational aviation:**<br>SPI 2.2: no numerical target.<br>The situation assessment is based on the development of the absolute and proportional number of incidents. | GREEN | Q1-Q4/2024: 8 runway deviations in general and recreational aviation, a number lower than in previous years.<br><br>The situation assessment is changed from yellow to green, as the situation has been developing well for several years.<br>The development direction is changed to neutral. |
| **SPI 2.2: Number of runway incursions (RI-VAP)** | **Land vehicles and persons:**<br>SPI 2.2: no numerical target.<br>The situation assessment is based on the development of the absolute and proportional number of incidents. | YELLOW | Q1-Q4/2024: 25 vehicle-caused runway deviations. Slightly more vehicle-caused runway incursions at airports than in previous years. Relative to the number of operations, the number of incidents at airports was above the long-term average. No runway incursions were caused by persons.<br><br>The situation assessment is maintained at yellow.<br>The trend is changed from neutral to negative. |

| Aviation safety monitoring table - operational level 2 (most typical causal factors of accidents) indicators<br>Indicator | Target | Situation assessment | Situation assessment of the historical and current situation by. |
|---|---|---|---|
| **SPI 2.3: Number of collisions and near misses (MAC/AIRPROX)** | **Commercial air transport:**<br>SPI 2.3: no numerical target.<br>The situation assessment is based on the development of the absolute and proportional number of incidents . | YELLOW | Q1-Q4/2024: Finnish commercial air transport was involved in 43 near misses. The number was still well above average.<br><br>The situation assessment is considered yellow. The development direction is considered negative. The conflict in Ukraine is considered to increase the risk of a collision or near-miss. |
| **SPI 2.3: Number of collisions and near misses (MAC/AIRPROX)** | **General and recreational aviation:**<br>SPI 2.3: no numerical target.<br>The situation assessment is based on the development of the absolute and proportional number of incidents. | GREEN | Q1-Q4/2024: general and recreational aviation involved in 18 cases (18 in Finland). The number was in line with the average.<br><br>The situation assessment is kept green. The development direction is changed from neutral to negative. There has been a slight increase in the number of domestic events in the last couple of years. |
| **SPI 2.3: Number of collisions and near misses (MAC/AIRPROX)** | **Air navigation services:**<br>SPI 2.3: no numerical target.<br>The situation assessment is based on the development | YELLOW | Q1-Q4/2024: 20 aircraft separation violations caused by air traffic control. |

| Aviation safety monitoring table - operational level 2 (most typical causal factors of accidents) indicators<br>Indicator | Target | Situation assessment | Situation assessment of the historical and current situation<br>by. |
|---|---|---|---|
| | of the absolute and proportional number of incidents. | | The number was above the average for 2014-2023. In relation to the number of operations, the number was also above the average.<br>The situation assessment is kept yellow. The development direction is changed from positive to neutral. |
| **SPI 2.4: Number of controlled flight into terrain and near misses (CFIT)** | **Commercial air transport:**<br>SPI 2.4: no numerical target.<br>The situation assessment is based on the development of the absolute and proportional number of incidents. | GREEN | Q1-Q4/2024: 2 CFIT situations in Finnish commercial air transport. Incidents in hot air balloon operations and helicopter operations.<br><br>Situation assessment is considered green. Development direction is considered neutral. |
| **SPI 2.4: Number of controlled flight into terrain and near misses (CFIT)** | **General and recreational aviation:**<br>SPI 2.4: no numerical target.<br>The situation assessment is based on the development of the absolute and proportional number of incidents. | GREEN | Q1-Q4/2024: 1 CFIT/near CFIT situation in general and recreational aviation. Number below the longer-term average.<br><br>Situation assessment is considered green. Development direction is considered neutral. |
| **SPI 2.5: Number of aircraft loss of control incidents (LOC-I)** | **Commercial air transport:**<br>SPI 2.5: no numerical | GREEN | Q1-Q4/2024: no loss of control situations in |

| Aviation safety monitoring table - operational level 2 (most typical causal factors of accidents) indicators<br>Indicator | Target | Situation assessment | Situation assessment of the historical and current situation<br>by. |
|---|---|---|---|
| | target.<br>The assessment is based on the development of the absolute and proportional number of incidents. | | Finnish commercial air transport. Number below average.<br><br>Situation assessment is considered green. Development direction is considered neutral |
| **SPI 2.5: Number of aircraft loss of control incidents (LOC-I)** | **General and recreational aviation:**<br>SPI 2.5: no numerical target.<br>The situation assessment is based on the development of the absolute and proportional number of incidents. | GREEN | Q1-Q4/2024: 4 loss of control situations in general and recreational aviation. Number below the average of previous years.<br><br>Situation assessment is considered green. Development direction is considered neutral. |
| **SPI 2.6: Number of collisions while taxiing to or from the runway (GCOL)** | **Commercial air transport:**<br>SPI 2.6: no numerical target.<br>The assessment is based on the development of the absolute and proportional number of incidents. | GREEN | Q1-Q4/2024: no GCOL cases in commercial air transport. Number below average.<br><br>Situation assessment kept green. Development direction changed from negative to neutral. |
| **SPI 2.6: Number of collisions while taxiing to or from the runway (GCOL)** | **General and recreational aviation:**<br>SPI 2.6: no numerical target.<br>The situation assessment is based on the development of the absolute and proportional number of incidents. | GREEN | Q1-Q4/2024: no GCOL cases in general and recreational aviation. Number below the longer-term average.<br><br>The situation assessment is kept green. The |

| Aviation safety monitoring table - operational level 2 (most typical causal factors of accidents) indicators<br>Indicator | Target | Situation assessment | Situation assessment of the historical and current situation<br>by. |
|---|---|---|---|
| | | | development direction is changed from negative to neutral. |

# 13 Glossaries and definitions

**ACAS** (Airborne Collision Avoidance System) is an airborne collision warning system that meets the requirements of ACAS II (Revision 7) in Annex 10, Volume IV, Chapter 4 to the Convention on International Civil Aviation. The system is based on the exchange of information between aircraft transponders, which, if necessary, provides pilots with warnings and alerts about other aircraft flying nearby. A system that meets the requirements of ACAS II is known as TCAS (Traffic Collision Avoidance System). The system issues either warnings (TA – Traffic Advisory) or action instructions (RA – Resolution Advisory).

**Accident** means an occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have dis-embarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:

a) a person is fatally or seriously injured as a result of:

• being in the aircraft, or,

• direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or,

• direct exposure to jet blast,

except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or

b) the aircraft sustains damage or structural failure which adversely affects the structural strength, performance or flight characteristics of the aircraft, and would normally require major repair or replacement of the affected component, except for engine failure or damage, when the damage is limited to a single engine, (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tyres, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes) or minor damage to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike, (including holes in the radome);

or

c) the aircraft is missing or is completely inaccessible

Serious injury means an injury which is sustained by a person in an accident and which involves one of the following:

a) hospitalisation for more than 48 hours, commencing within seven days from the date the injury was received;

b) a fracture of any bone (except simple fractures of fingers, toes or nose);

c) lacerations which cause severe haemorrhage, nerve, muscle or tendon damage;

d) injury to any internal organ;

e) second or third degree burns, or any burns affecting more than five per cent of the body surface;

f) verified exposure to infectious substances or harmful radiation.

**Airspace infringement (AI)** refers to a situation where an aircraft flies into controlled or restricted (prohibited (P) or restricted (R)) airspace or an ADIZ (Air Defence Identification Zone) without the required permission or clearance. Flying into the airspace of an AFIS unit without the required radio contact is also classified as an airspace infringement.

**Aviation Safety Indicators (Safety Performance Indicator, SPI)** All safety indicators used in aviation (level 1, level 2 and level 3) with their abbreviations and definitions can be found in Appendix 2 of the Finnish Aviation Safety Program.

**CFIT/near CFIT (Controlled flight into or towards terrain, CFIT)** refers to a situation in which an airworthy aircraft under the control of a pilot unintentionally collides with the ground, water or an obstacle, or a similar near miss occurs.

**Collision while taxiing to/from a runway (Ground collision, GCOL)** refers to a situation in which an aircraft collides with another aircraft, vehicle, person, animal, structure, building or other obstacle while moving under its own power (excluding powerpushback) on a part of the airfield other than the runway in use.

**Commercial air transport** refers to the use of an aircraft to transport passengers, cargo or mail for payment or other compensation.

**EASA** (European Aviation Safety Agency) The European Aviation Safety Agency is responsible for ensuring the safety and environmental protection of European air transport.

**Foreign commercial air transport** refers to the transport of passengers, cargo or mail carried out on a non-Finnish aircraft or on the basis of an air operator's certificate issued elsewhere than in Finland, for payment or other compensation.

**General aviation** refers to all aviation other than commercial air transport and aerial work.
Note: in this publication, general aviation and aerial work are treated as one single category. In addition, recreational aviation is treated as a separate category.

**Ground handling** refers to the ground handling services provided to airport users at an airport, including passenger handling, baggage handling, cargo and mail handling, apron services, aircraft cleaning and other services, fuel and oil handling, aircraft technical maintenance, flight operations and crew assistance, ground transportation, catering services and ground handling management and supervision (source: Ground Handling Directive 96/67/EC, annex).

**ICAO** International Civil Aviation Organisation is an international civil aviation organisation under the UN.

**Loss of control in flight (LOC-I)** refers to a situation in which an aircraft in flight loses control and significantly deviates from its intended flight path. The loss of control may be momentary or total. The cause may be, for example, human error, mechanical failure or external factors.

**Mid-air collision (MAC) and near miss (AIRPROX)** refer to a situation in which aircraft in the air collide with each other or in which the distance between aircraft in the air and their relative positions and speeds have been such that the safety of the aircraft may have been compromised.

**Recreational aviation** refers to gliding, motor gliding, ultralight, autogyro, hot air ballooning, hang gliding, paragliding and parachuting.
Note: If a hot air balloon flight carries passengers for a fee, it is considered commercial air transport.
Note 2. This publication does not cover hang gliding, paragliding or parachuting.

**Runway excursion (RE)** refers to a situation in which an aircraft uncontrollably exits from the runway it is using during take-off or landing. The deviation may be unintentional or intentional, e.g. as a result of an evasive maneuver.

**Runway incursion (RI-VAP)** refers to a situation where an aircraft, vehicle or person is on a runway or its protected area without permission or otherwise in error. Such situations also include low approaches that have been carried out without permission or otherwise in error.

**Serious incident** means an incident involving circumstances indicating that there was a high probability of an accident and is associated with the operation of an aircraft, which in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time it comes to rest at the end of the flight and the primary propulsion system is shut down. A list of examples of serious incidents has been published in an Annex to the **EU Regulation 996/2010**.

**State aviation** refers to aviation in military, customs or police operations, search and rescue services, firefighting, border control, coast guard or comparable activities or services performed by an actor authorized by a public authority or on its behalf in the public interest under the supervision and responsibility of the authority.

**Unmanned aerial vehicles (RPAS, drone operations)** refers to operations with unmanned aircraft or drones.

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