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Runway Performance Report **2024**

ANTWERP AIRPORT

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Runway performance report

Antwerp Airport

EXECUTIVE SUMMARY

The global aviation industry is experiencing a swift resurgence and throughout Europe traffic levels of 2019 are being reached. Remarkably, Antwerp Airport had already surpassed 2019 traffic in 2021. Despite this positive trajectory, the airport witnessed a drop in traffic, falling below the 2019 traffic levels in 2024.

This report gives an overview of skeyes' operations at Antwerp Airport (ICAO code: EBAW) for 2024 covering traffic analyses and providing relevant data on the performance of Air Traffic Management (ATM). ATM performance is driven by four Key Performance Areas (KPAs): safety, capacity, environment and cost-efficiency. This report aims to provide information on three of these four KPAs: safety, capacity and environment.

Traffic

As mentioned, traffic levels at Antwerp Airport in 2024, fall below those of 2019 and 2023. skeyes controlled 31,676 movements at Antwerp Airport in 2024. It experienced a significant -12% dip compared to both 2019 and 2023. Instrument Flight Rule (IFR) traffic decreased by 15% from 2023, partially due to the significant absence of TUI fly Belgium at the end of the summer. VFR traffic was dominant at Antwerp Airport in 2024, accounting for approximately 62% of total traffic in 2024. However, a discernible -13% downturn in VFR activity, compared to the previous year, is noteworthy. This decline is primarily ascribed to adverse weather conditions, notably in the months of February, June and September.

In terms of runway use, runway 29 saw a 62% usage rate, with the highest usage rate in the month of April.

Safety

Safety is an important pillar in air traffic control. As such, safety occurrences and missed approaches are followed up by skeyes' safety unit who analyses the situations, trends and, when relevant, investigates.

The number of missed approaches, a procedure used when the approach cannot be continued for a safe landing, and particularly their cause, can indicate which measures are to be taken to improve the safety of air navigation service provision. In 2024, 31 missed approaches were logged, an improvement of 18% compared to 2023. The rate of missed approaches per 1,000 arrivals decreased to the same level as in 2022, at two per 1,000 arrivals. Unstable approaches were the most common reason for missed approaches in 2024.

Regarding safety occurrences, the report shows the safety events on runways and taxiways. The number of runway incursions decreased from eight incursions in 2023 to six in 2024. After investigation none of the runway incursions were found to have an Air Traffic Management (ATM) contribution. Most of the incidents were cases where a pilot didn't follow a clearance or proceeded without getting one. Besides the runway incursions, there was also one runway excursion.

Capacity and Punctuality

Capacity and delay go hand in hand when it comes to runway performance. The throughput capacity of the airport is analysed, comparing actual traffic with the declared IFR capacity. Even though the theoretical IFR capacity was exceeded on three days, the total amount of instances where the declared capacity was exceeded was less than a third of 2023 's. The movements at these peak moments were almost all VFR movements, meaning that the aerodrome never reached its IFR capacity limit.

While there are no targets set by the Functional Airspace Block Europe Central (FABEC) performance plan at Antwerp Airport, as part of a continuous monitoring of the ANSP's performance, skeyes registers the arrival Air Traffic Flow Management (ATFM) delays for Antwerp Airport, as an internal performance indicator. There has been no arrival delay recorded since 2018.

For information purposes, the report also provides an indication of how traffic bound to or taking off from Antwerp Airport, with a flight plan submitted to the Network Manager, was affected by ATFM delay, and indicates which share of this delay was caused by regulations placed by skeyes. In 2024, flights departing from Antwerp Airport experienced a total of 11,710 minutes of ATFM delay, of which 6% was attributable to skeyes. Arriving flights encountered a total ATFM delay of 13,836 minutes, with 3% resulting from ATFM measures placed by skeyes.

Environment

The Preferential Runway System (PRS) in Antwerp indicates that aircraft exceeding 5,700kg should use runway 11 for take-off if conditions permit – crosswind not exceeding 15 knots, or tailwind, including gusts, not exceeding 5 knots. The PRS adherence decreased from 46% in 2023 to 39% in 2024.

Night movements, as they are relevant for local noise measures, are also mentioned in this chapter. The surge in movements between 23:00 and 00:00 (Local Time) in 2024 decreased from 17 to 10 flights, compared to 2023. However, the total number of nightly movements in 2024 was at 11, still higher than the years before 2023.

SAMENVATTING

De wereldwijde luchtvaartindustrie beleeft een snelle heropleving en doorheen Europa worden verkeersniveaus van 2019 bereikt. Opmerkelijk is dat de luchthaven van Antwerpen het verkeersvolume van 2019 al in 2021 had overtroffen. Ondanks dit positieve traject zag de luchthaven het verkeer in 2024 afkalven tot onder het niveau van 2019.

Dit verslag biedt een overzicht van de activiteiten van skeyes op de luchthaven van Antwerpen (ICAO-code: EBAW) voor 2024, met verkeersanalyses en relevante data over de prestaties inzake luchtverkeersbeheer (Air Traffic Management, ATM). Die prestaties worden bepaald door vier prestatiekerngebieden (KPAs, Key Performance Areas): veiligheid, capaciteit, milieu en kostenefficiëntie. Dit verslag beoogt informatie te verstrekken over drie van de vier prestatiekerngebieden: veiligheid, capaciteit en milieu.

Verkeer

Zoals vermeld, duikt het verkeersniveau op de luchthaven van Antwerpen in 2024 onder dat van 2019 en 2023. skeyes controleerde 31.676 bewegingen op de luchthaven van Antwerpen in 2024, goed voor een significante krimp met -12% in vergelijking met zowel 2019 als 2023. Het IFR-verkeer (Instrument Flight Rules) nam vanaf 2023 af met 15%, gedeeltelijk door de significante afwezigheid van TUI fly Belgium op het einde van de zomer. Het VFR-verkeer is dominant op de luchthaven van Antwerpen in 2024, goed voor ongeveer 62% van het totale verkeer in 2024. Een duidelijk te onderscheiden neergang van de VFR-activiteit met -13%, vergeleken met het voorgaande jaar, was echter opmerkelijk en was voornamelijk toe te schrijven aan ongunstige weersomstandigheden, met name in de maanden februari, juni en september.

Wat het baangebruik betreft, werd baan 29 voor 62% gebruikt, een percentage dat het hoogst opliep in de maand april.

Veiligheid

Veiligheid is een belangrijke pijler in de luchtverkeersleiding. In dat verband volgt de safety unit van skeyes veiligheidsvoorvallen en afgebroken naderingen op om situaties te analyseren, trends in kaart te brengen en, zo nodig, verder onderzoek te verrichten.

Het aantal afgebroken naderingen (een procedure die wordt gebruikt wanneer de nadering niet kan worden voortgezet met het oog op een veilige landing), en in het bijzonder de oorzaak ervan, kunnen aangeven welke maatregelen moeten worden genomen om de luchtvaartnavigatiedienstverlening veiliger te maken. In 2024 werden er 31 afgebroken naderingen geregistreerd, een verbetering met 18% ten opzichte van 2023. Het aantal afgebroken naderingen per 1.000 aankomsten daalde tot hetzelfde niveau als in 2022, namelijk 2 per 1.000 aankomsten. Onstabiele naderingen waren de vaakst voorkomende reden voor een afgebroken nadering in 2024.

Nog op het vlak van veiligheid vertoont dit verslag de veiligheidsvoorvallen op start- en landingsbanen en taxibanen. Het aantal runway incursions daalde van acht in 2023 naar zes in 2024. Na onderzoek bleek geen van de runway incursions een bijdrage van Air Traffic Management te hebben. De meeste incidenten waren gevallen waarbij een piloot een klaring niet opvolgde of zijn procedure voortzette zonder er een te krijgen. Naast de runway incursions was er ook één runway excursion.

Capaciteit en stiptheid

Capaciteit en vertraging gaan hand in hand als het gaat om de prestaties op start- en landingsbanen. De doorvoercapaciteit van de luchthaven wordt geanalyseerd door het werkelijke verkeer te vergelijken met de opgegeven IFR-capaciteit. Ook al was de theoretische IFR-capaciteit op drie dagen overschreden, het totale aantal gevallen waarin de opgegeven capaciteit werd overschreden, bedroeg minder dan een derde van dat van 2023. De bewegingen op die piekmomenten waren bijna allemaal VFR-bewegingen, wat betekent dat het vliegveld nooit de limiet van zijn IFR-capaciteit bereikte.

Hoewel er voor de luchthaven van Antwerpen in het FABEC-prestatieplan (Functional Airspace Block Europe Central) geen doelstellingen zijn vastgelegd, registreert skeyes, in het kader van een continue monitoring van zijn prestaties als luchtvaartnavigatiedienstverlener, de ATFM-vertraging(en) (ATFM, Air Traffic Flow Management) bij aankomst, als een interne prestatie-indicator. Sinds 2018 werd er geen vertraging bij aankomst opgetekend.

Ter informatie voorziet het verslag tevens in een indicatie van de gevolgen van ATFM-vertraging voor het inkomend of uitgaand verkeer op de luchthaven van Antwerpen, met een vliegplan dat aan de Network Manager wordt voorgelegd, en wordt aangegeven welk deel van deze vertraging werd veroorzaakt door reguleringen van skeyes. In 2024 liepen vertrekkende vluchten vanaf de luchthaven van Antwerpen in totaal 11.710 minuten ATFM-vertraging op, waarvan 6% te wijten was aan skeyes. In het geval van de aankomende vluchten bedroeg de totale ATFM-vertraging 13.836 minuten; 3% van die vertraging was te wijten aan ATFM-maatregelen van skeyes.

Milieu

Het systeem van preferentieel baangebruik (Preferential Runway System, PRS) in Antwerpen schrijft voor dat vliegtuigen zwaarder dan 5.700 kg baan 11 zouden moeten gebruiken om op te stijgen, als de omstandigheden dat toelaten: zijwind van niet meer dan 15 knopen, of staartwind, inclusief windvlagen, van ten hoogste 5 knopen. De mate waarin het PRS nageleefd werd, daalde van 46% in 2023 tot 39% in 2024.

Verder in dit hoofdstuk worden ook nachtbewegingen besproken, omwille van hun relevantie voor lokale maatregelen tegen geluidshinder. De piek in bewegingen tussen 23:00 en 00:00 (plaatselijke tijd) in 2023 daalde van 17 naar 10 vluchten. Het totale aantal nachtbewegingen in 2024 bedraagt 11 en ligt nog altijd hoger dan de jaren vóór 2023.

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GLOSSARY

AAE: Aerodrome Elevation
AIP: Aeronautical Information Publication
AMC: Acceptable Means of Compliance
AMS: Airport Movement System
ANSP: Air Navigation Service Provider
ATC: Air Traffic Control
ATCO: Air Traffic Control Officer
ATFM: Air Traffic Flow Management
ATM: Air Traffic Management
BCAA: Belgian Civil Aviation Authority
BURDI Belgium-Netherlands U-space Reference Design Implementation
CAA: Civil Aviation Authority
CISP: Common Information Service Provider
COVID-19: Corona Virus Disease (2019)
CRSTMP: C-Capacity, R-Routeing, S-Staffing, T-Equipment, M-Airspace Management, P-Special Event
CTR: Control Zone
DSA: Drone Service Application
DSNA: Direction des Services de la navigation aérienne
DFS: Deutsche Flugsicherung
EASA: European Union Aviation Safety Agency
EBAW: Antwerp International Airport ICAO Code
EBBR Brussels Airport ICAO Code
EBCI: Brussels South Charleroi ICAO Code
EBKT: Kortrijk-Wevelgem International Airport ICAO Code
EBLG: Liege Airport ICAO Code
EBOS: Ostend–Bruges International Airport ICAO Code
FABEC: Functional Airspace Block Europe Central
GeoZone: Geographical Zone
ICAO: International Civil Aviation Organization
IFR: Instrument Flight Rules
KPA: Key Performance Area
LRST: Local Runway Safety Team
LVO: Low Visibility Operations
LVP: Low Visibility Procedures
MTOW: Maximum Take-Off Weight
NM: Nautical Mile
PRS: Preferential Runway System
RAT: Risk Analysis Tool
ROTA: Runway Occupancy Time for Arrival
RPAS: Remotely Piloted Aircraft Systems
RWY: Runway
SRO: Simultaneous Runway Occupancy
UAS: Unmanned Aircraft System
USSP: U-Space Service Provider
VFR: Visual Flight Rules
VLL: Very Low Level
VMC: Visual Meteorological Conditions

1 TRAFFIC

In this chapter, traffic at Antwerp Airport (International Civil Aviation Organization (ICAO) code: EBAW)) is presented as recorded by the Airport Movement System (AMS). AMS is an in-house developed tower Air Traffic Control (ATC) system that meticulously records aircraft movements within the aerodrome and its Control Zone (CTR). Movements are categorized into movements of aircraft either crossing the CTR, landing or taking off at the aerodrome. As this report considers runway performance, movements such as crossings of CTRs are not considered.

The numerical data presented in this report thus encapsulates movements in the form of take-offs or landings, encompassing all kind of traffic at the aerodrome, including flights under Visual Flight Rules (VFR) and Instrumental Flight Rules (IFR), helicopters and airplanes, and traffic of any market segment (e.g. commercial, military, or general aviation).

Adhering to the aerodrome movement definition established by the Belgian Civil Aviation Authority (BCAA), each recorded instance is quantified as follows:

- **one take-off = one movement**
- **one landing = one movement**
- **one touch-and-go = two movements**

Traffic Overview

The number of aircraft movements for 2019 and the last three years are as follows:

2019:	**35,794 movements**	(14,138 IFR; 21,656 VFR)
2022:	**40,432 movements**	(13,714 IFR; 26,718 VFR)
2023:	**36,153 movements**	(13,470 IFR; 22,683 VFR)
2024:	**31,676 movements**	(12,050 IFR; 19,626 VFR)

In the ATM world, 2019 is the reference year before the decrease in traffic due to COVID-19. For this reason traffic in 2019 is taken as a reference to which current traffic numbers are compared throughout this report. After two years of increase in traffic, traffic levels began to decrease in 2023, and this trend continued into 2024. The total number of movements decreased by 12% compared to 2023, which was slightly higher than the 2019 figures. From ***Figure 1.1***, which provides further information on the historical numbers of IFR and VFR flights, it can be seen that the decrease stems from both IFR and VFR traffic being lower than in 2023.

Figure 1.1: *Historical traffic overview*

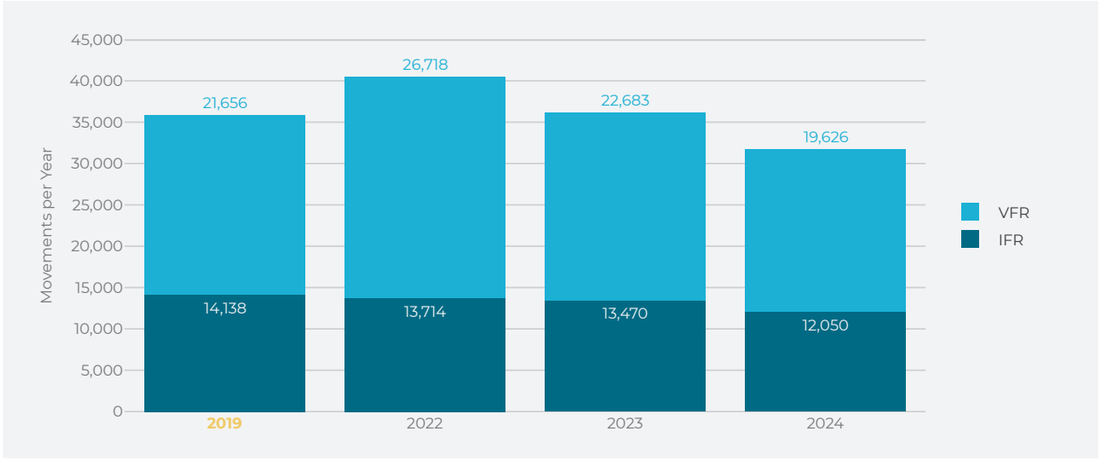


Table 1.1 gives the number of movements per flight rule per month. The airport experienced a lower amount of movements throughout the year in comparison with 2023, except in January, July, and November. Overall there was a decline of 12% in total movements. VFR movements show a noticeable decrease of 13% from 2023 to 2024. After a steep drop in 2020 , the following year saw increased growth, surpassing 2019 traffic. Since 2021, the yearly amount of VFR traffic has decreased by 26%. This drop is mainly caused by worse weather conditions compared to 2022, especially in March and July, two of the busiest months for VFR traffic in 2022. March 2022 had more than double the amount of sun-hours compared to March 2024, with 227 sun-hours. In a similar fashion, July 2022 had 50% more movements than July 2024. Compared to 2023 traffic, however, these months were slightly higher in 2024.[1] Nonetheless, the months with the largest differences between 2023 and 2024 can also be found in the weather data. There was a drop in the amount of days with Visual Meteorological Conditions (VMC) in February, June and September. Especially for the month of June, where 2024 saw only one third of VMC instances compared to 2023.

The IFR decrease in 2024 was similar to the VFR decrease, at -11% compared to 2023. In comparison with the reference year of 2019, the traffic level of 2024 was 15% lower. During the months of August and September there was respectively 14% and 23% less IFR traffic than in the year before, 2023. The cause is the absence of TUI fly Belgium flights, from the 27th of July until their return on the 7th of October. The airline was responsible for more than two hundred movements during both the months of August and September in 2023. Its absence was due to a shortage of spare parts for the Embraer E195 E2 and the runway at Antwerp Airport is not long enough for the Boeing 737 replacement.[2]

1. **KMI :** https://www.meteo.be/nl/klimaat/klimaat-van-belgie/klimatologisch-overzicht/2024 (URL retrieved 30/01/2025)
2. **TUI fly Belgium diverts all Antwerp Airport flights via Brussels,** https://www.aviation24.be/airlines/tui-aviation/tui-fly-belgium/tui-fly-belgium-diverts-all-antwerp-airport-flights-via-brussels-due-to-embraer-e195-e2-spare-parts-shortage/ (URL retrieved on 03/12/2024)

The evolution per month can be seen also in ***Figure 1.2***. It is immediately clear that variations for the total amount of movements were mainly determined by VFR traffic. The biggest trends discussed for ***Table 1.1*** are visible on these graphs. Also note that the drop for October 2022 in all three graphs was due to works on the runway.

Figure 1.2: *Monthly movements per year*

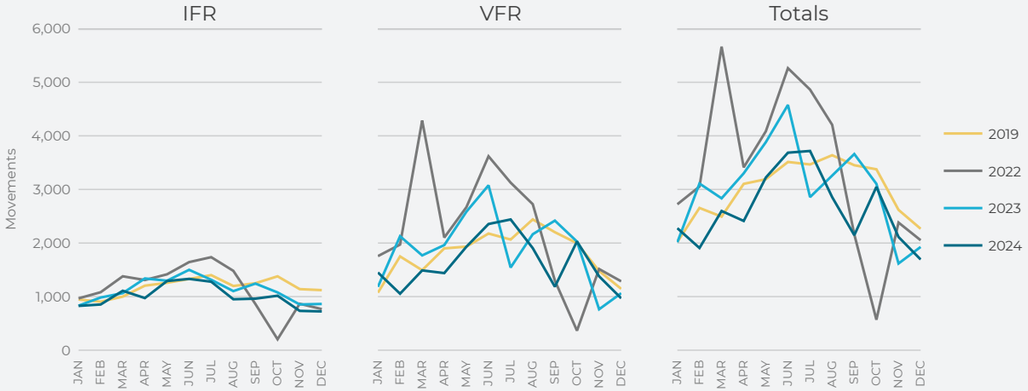


Table 1.1: *Monthly movements per flight rule per year*

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
IFR	**2019**	946	905	1,000	1,204	1,258	1,336	1,401	1,198	1,250	1,379	1,140	1,121	**14,138**
	2022	967	1,082	1,379	1,310	1,416	1,644	1,736	1,481	861	204	867	767	**13,714**
	2023	831	983	1,065	1,339	1,297	1,500	1,314	1,103	1,243	1,078	854	863	**13,470**
	2024	827	853	1,109	973	1,291	1,331	1,278	951	962	1,017	734	724	**12,050**
	2024 *vs* 2019	-13%	-6%	+11%	-19%	+3%	0%	-9%	-21%	-23%	-26%	-36%	-35%	-15%
	2024 *vs* 2023	0%	-13%	+4%	-27%	0%	-11%	-3%	-14%	-23%	-6%	-14%	-16%	-11%
VFR	**2019**	1,074	1,750	1,493	1,900	1,933	2,177	2,065	2,441	2,202	1,997	1,479	1,145	**21,656**
	2022	1,756	1,971	4,285	2,102	2,669	3,619	3,127	2,725	1,299	365	1,515	1,285	**26,718**
	2023	1,183	2,127	1,769	1,962	2,585	3,077	1,543	2,164	2,418	2,027	764	1,064	**22,683**
	2024	1,450	1,054	1,489	1,439	1,931	2,355	2,440	1,905	1,185	2,030	1,379	969	**19,626**
	2024 *vs* 2019	+35%	-40%	0%	-24%	0%	+8%	+18%	-22%	-46%	+2%	-7%	-15%	-9%
	2024 *vs* 2023	+23%	-50%	-16%	-27%	-25%	-23%	+58%	-12%	-51%	0%	+80%	-9%	-13%
Total	**2019**	2,020	2,655	2,493	3,104	3,191	3,513	3,466	3,639	3,452	3,376	2,619	2,266	**35,794**
	2022	2,723	3,053	5,664	3,412	4,085	5,263	4,863	4,206	2,160	569	2,382	2,052	**40,432**
	2023	2,014	3,110	2,834	3,301	3,882	4,577	2,857	3,267	3,661	3,105	1,618	1,927	**36,153**
	2024	2,277	1,907	2,598	2,412	3,222	3,686	3,718	2,856	2,147	3,047	2,113	1,693	**31,676**
	2024 *vs* 2019	+13%	-28%	+4%	-22%	0%	+5%	+7%	-22%	-38%	-10%	-19%	-25%	-12%
	2024 *vs* 2023	+13%	-39%	-8%	-27%	-17%	-19%	+30%	-13%	-41%	-2%	+31%	-12%	-12%

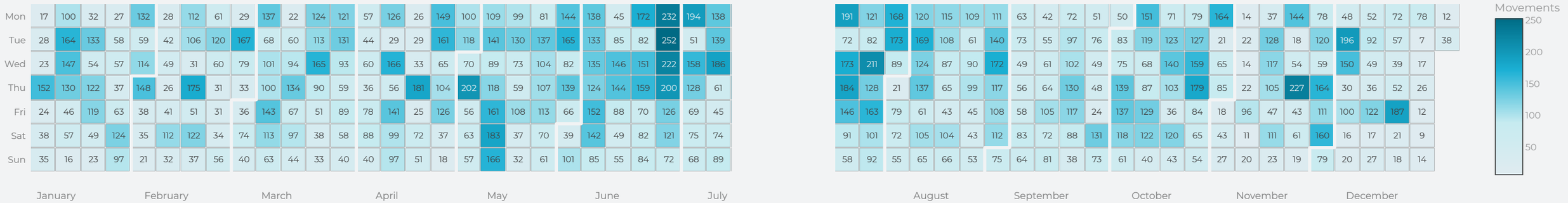
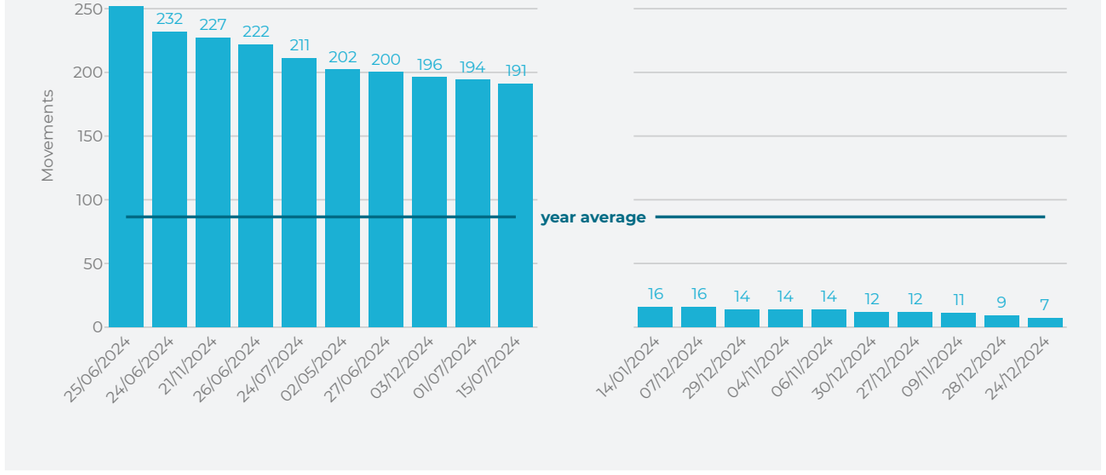


Figure 1.3: *Calendar view of movements per day in 2024*

The calendar in ***Figure 1.3*** shows the daily movements throughout the year. The busiest days occurred in June and July, with June being the busiest month. A decrease of movements occurred in August, this decrease in the later summer was related to weather conditions that limited VFR flights. There was an average of 87 movements per day in 2024, while the average was 99 movements per day in 2023. The top and bottom ten days of traffic are presented in ***Figure 1.4***. It is immediately clear that day to day traffic differed a lot, with a factor of 36. The busiest day of the year with 252 movements was the 25th of June. The least busy day was Christmas Eve with seven flights, which together with other low days during the Christmas week can be explained by the holidays combined with the winter weather. Note that even the tenth busiest and tenth calmest days still differ by a factor of 12, alluding to a high variability in traffic at Antwerp Airport. Despite the aforementioned days some others are worth looking at. During the weekend of the 11th and 12th of May, the 30th edition of the Stampe Fly-In took place, being responsible for the busiest weekend of the year with respectively 183 and 166 movements on Saturday and Sunday.[3] Another notable occurrence was a bomb threat on the 28th of June, following the busiest week of 2024, as each of the preceding four days had more than 200 movements, while the day of the threat had 126. The threat is discussed in more detail under Other Noteworthy Incidents of the Safety chapter.

Figure 1.4: *Top ten and bottom ten days of traffic in 2024*



3. 30th Stampe Fly-In takes flight at Antwerp Airport, https://www.aviation24.be/airports/antwerp/30th-stampe-fly-in-takes-flight-at-antwerp-airport-may-11th-12th-2024/ (URL retrieved on 03/12/2024)

Traffic Patterns

This section describes the traffic pattern throughout the day in Antwerp Airport. The combined IFR and VFR hourly traffic pattern can be seen in ***Figure 1.5***. The graph shows the average number of movements in an hour per half hour steps. The traffic pattern of IFR traffic in Antwerp Airport remains similar across years, any differences between the years are thus due to VFR traffic. As the VFR traffic is clustered in the daylight hours, the traffic before 08:00 and after 21:00 is almost exclusively IFR, and the higher values during the rest of the day are caused by VFR traffic, which makes up 62% of all movements. During this period, IFR traffic remained fairly consistent, with an increase after noon, between 12:00 and 16:00. The same applies for Sundays, which tend to be the least busy days, because training flights are not allowed as published in the Aeronautical Information Publication (AIP).[4]

Figure 1.6 shows the traffic pattern over the day for each of the seasons. As expected, summer allows more movements to occur thanks to longer days and better meteorological conditions for VFR. The opposite occurs during the winter with fall and spring falling in between.

Figure 1.5: *Average hourly movements per year*

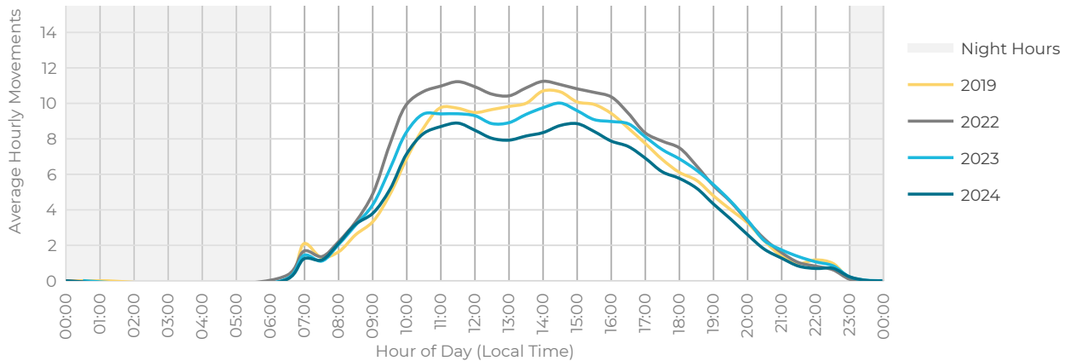
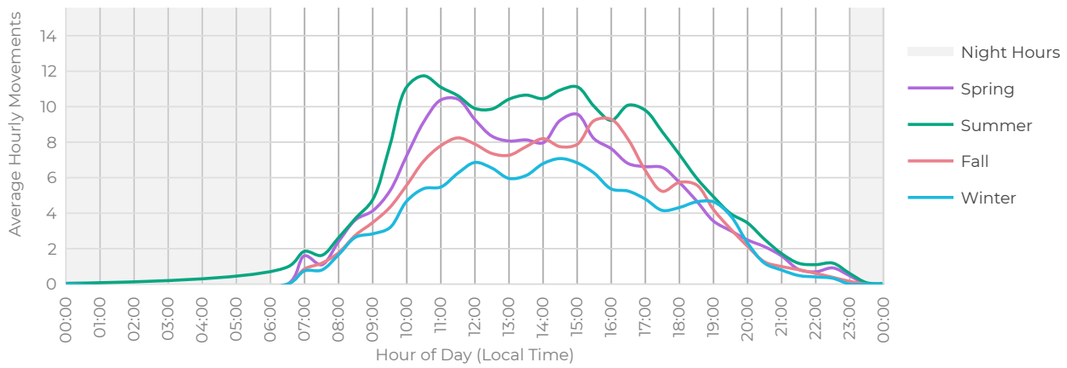


Figure 1.6: *Average hourly movements by season*



4. AD 2.20, Ch. 5.7 - https://ops.skeyes.be/html/belgocontrol_static/eaip/eAIP_Main/html/eAIP/EB-AD-2.EBAW-en-GB.html

Runway Use

The layout of Antwerp Airport with its two reciprocal runways (RWY), designated as runway 11 and runway 29, is depicted in ***Figure 1.7***. The ICAO aerodrome chart provides detailed airport layout and operational information. The runways are well-suited for the airport's focus on VFR operations and business aviation, with their 1,500-meter length.

The use of one runway configuration over another depends on several factors that have to be taken into account, such as meteorological conditions or runway equipment for example. At Antwerp Airport, there is a preferential runway system to be used, as mentioned in the AIP.[5] The following Preferential Runway System (PRS) is in place at Antwerp Airport: with weather and traffic permitting, aircraft with weight exceeding 5,700kg shall use runway 11 in preference to runway 29 when departing.

Figure 1.7: *Aerodrome ground movement chart*

The share of movements per runway can be seen in ***Figure 1.8***. The most used runway configuration was runway 29, which registered 19,706 movements (62% of the total) in 2024. Flights try to depart and land with headwind for aeronautical reasons. At Antwerp Airport observed winds are mainly from a south-westerly direction. This means that most winds have a large crosswind component, with the headwind component being a deciding factor for the runway configuration. Usually this results in a preference for runway 29, which is therefore used more often than its counterpart. Runway 11 was in used by 11,970 movements (38% of the total). The wind roses underneath the bar chart (see also ***Figure 4.3*** in the Environment chapter for bigger graphs and further explanations on the wind roses) further show the influence of different wind patterns on the runways in use. Please note that the use of the Preferential Runway System (PRS) is discussed in the Environment chapter.

Figure 1.8: *Runway usage per year in movements*

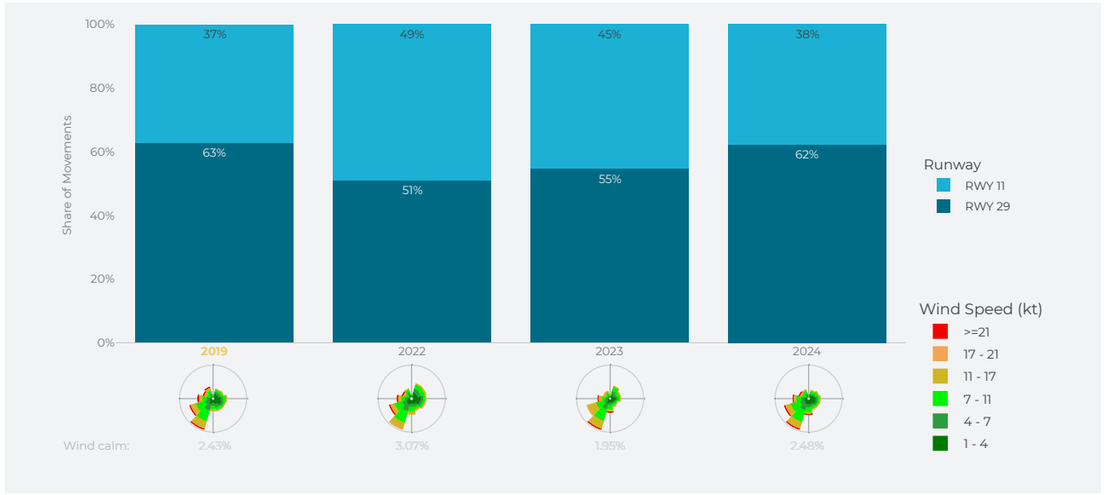
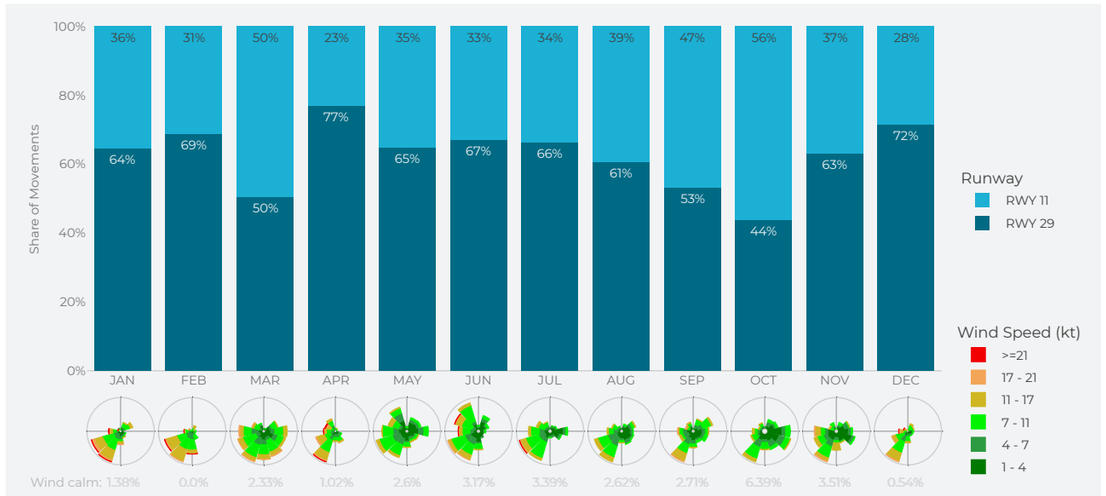


Figure 1.9 below shows the share of runway use per month in 2024 with the wind roses beneath. As mentioned above, wind direction is the main factor for the choice of the runway configuration. February, April and December had prevalent south-westerly winds with almost no (north-) easterly winds, resulting in the highest usage of runway 29. Meanwhile, March, September and October had a bigger share in (north-) easterly winds. This is reflected in the runway usage. As a consequence, runway 11 was the preferred configuration in October, that was used 56% of the time.

Figure 1.9: *Runway usage per month in 2024 in share of movements*



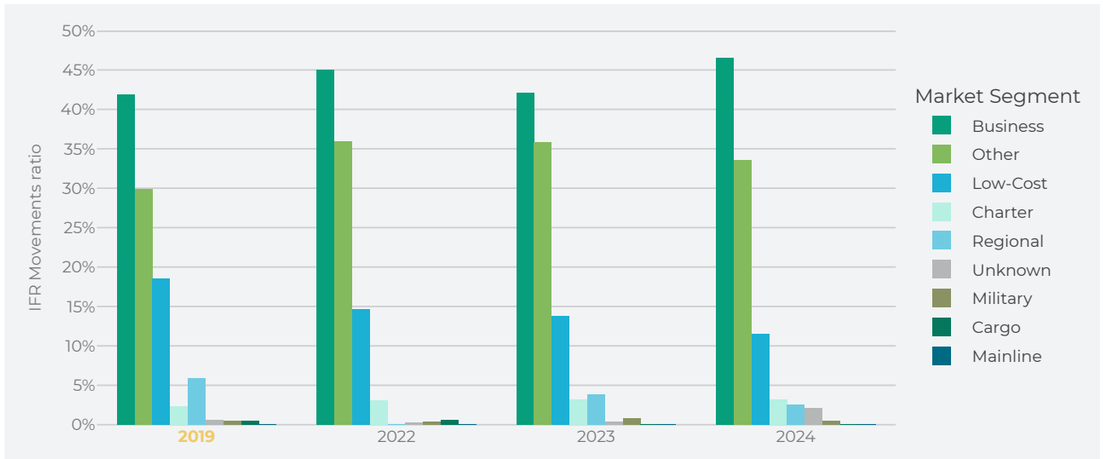
5. AD 2.20, Ch. 4.1, https://ops.skeyes.be/html/belgocontrol_static/eaip/eAIP_Main/html/eAIP/EB-AD-2.EBAW-en-GB.html#AD-2.EBAW

Market Contributions

This chapter delves into the type of market Antwerp Airport serves. First, the market segment distribution is shown in ***Figure 1.10***, based on the IFR traffic at the airport. To create this figure, the air traffic market segmentation rules from STATFOR/EUROCONTROL[6] and the flight plan information captured by skeyes' airport movement system were used. The EUROCONTROL's Market Segment Rules provide a definition for air traffic market segments based on lists of aircraft types, aircraft operators and the flight types filed on flight plans. After this general look into the market distribution at Antwerp Airport, a more detailed look is taken at its largest market share in the subchapter Business Aviation.

Figure 1.10 shows the market segment distribution for Antwerp Airport from 2022 to 2024 and the reference year of 2019. Due to incomplete data, there is an "Unknown" category for movements with missing information. This group is usually negligible, but for 2024 it made up 2% of all IFR traffic. To be noted, that all aircraft movements in the Unknown category belonged in fact to other segments, affecting the shown figures and percentages. Business traffic was responsible for the largest market share for Antwerp Airport - with 5,603 movements it was responsible for 47% of the airports movements. The next biggest share were flights classified as "Other", this category included all remaining IFR movements that could not be classified into any of the other seven segments. Aircraft movements that fell under this classification made up 34% of all IFR movements at Antwerp Airport. The third largest segment were movements identified as Low-Cost, made up almost entirely by flights from TUI fly Belgium. As seen in ***Figure 1.10***, this distribution was consistent throughout the years.

Figure 1.10: *Market segments distribution ratio (only IFR)*



6. **EUROCONTROL market segment rules,** https://www.eurocontrol.int/publication/market-segment-rules (URL retrieved on 20/01/2025)

The market segment distribution is followed by two lists, respectively the top ten international connections, as the airports to and from which most traffic departs and arrives, and the top airlines, as in responsible for the largest share of movements. These can be seen in ***Figure 1.11*** and ***Table 1.2.***

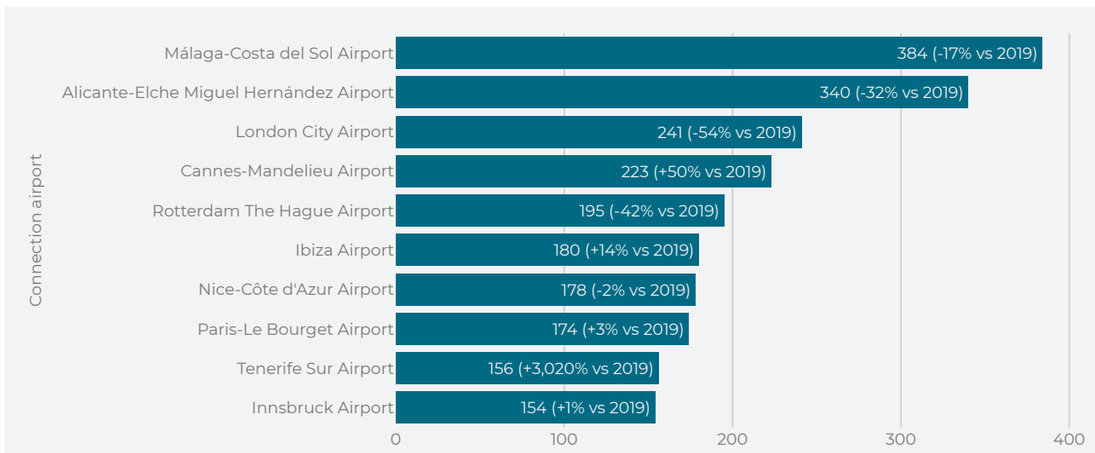
Belgian airports are very prominent in the top connections for Antwerp Airport, with airports such as Kortrijk-Wevelgem. The top considering only international connections of IFR flights are presented in ***Figure 1.11*** below. The top destination for four years in a row has been Málaga–Costa del Sol Airport, Spain (LEMG). Of all movements connecting this airport to Antwerp, the largest share was operated by TUI fly Belgium (JAF), contributing 288 of the 384 flights. Next in the list is another Spanish airport. The airport in question is Alicante–Elche Miguel Hernández Airport (LEAL), where once more TUI was responsible for 326 of 340 total flights.

Antwerp Airport experiences a lot of seasonal traffic. As such some destinations are more prominent or only serviced during a select period of the year. Examples of destinations during the summer season were Cannes–Mandelieu Airport, France (LFMD), Ibiza Airport, Spain (LEIB) and Nice Côte d'Azur Airport, France (LFMN). The seasonal change during the winter is related to alpine activities, with airports such as Innsbruck Airport, Austria (LOWI), Bolzano Airport, Italy (LIPB) and Sion Airport, Switzerland (LSGS).

Table 1.2: *Top 10 airlines of 2024 (only IFR)*

	JAF	ASL group	FYL	EPC	NJE	PGC	FYG	AGR	JNL	LGL	Total
2019	2,616	10	291	0	262	0	555	0	37	0	**3,771**
2022	2,004	244	631	364	316	1	406	28	288	0	**4,282**
2023	1,860	1,360	649	455	368	199	353	195	232	424	**6,095**
2024	1,394	1,357	902	535	350	349	272	221	211	206	**5,797**
2024 *vs* 2019	-47%	>999%	+210%	-	+34%	-	-51%	-	+470%	-	+54%
2024 *vs* 2023	-25%	0%	+39%	+18%	-5%	+75%	-23%	+13%	-9%	-51%	-5%

Figure 1.11: *Top 10 international connections (only IFR)*



Most movements performed by the top ten airlines presented in ***Table 1.2*** are classified as Business Aviation. This is in line with the market segment distribution presented in ***Figure 1.10***, the majority of IFR flights at Antwerp airport were classified as such. The largest airline however is considered Low-Cost: TUI fly Belgium (JAF). As discussed above, this airline has a large influence on the top connections. Most of its flights, 326 to be precise, are to and from Alicante–Elche Miguel Hernández Airport, Spain (LEAL). The next two largest connections are again in Spain: Málaga–Costa del Sol Airport (LEMG) and Tenerife South Airport (GCTS), with respectively 288 and 152 movements. Almost as prominent are flights managed by ASL group, they include both private and commercial flights. The airline's presence has grown significantly over the past few years, it had only 244 movements in 2022, up to 1,357 in 2024. ASL group also introduced the first two electric aircraft at Antwerp Airport in the beginning of this year.[7]

Figure 1.13 shows the largest differences in movements in 2024 compared to 2023. The largest decrease was from TUI fly Belgium (JAF). This is mainly due to the airlines absence from the 27th of July until their return on the 7th of October. However the airline also introduced a new destination: Oujda Angad Airport, Morocco (GMFO).[8] Another large decline was for Luxair (LGL), with less than half the amount of movements it had in 2023. The airline flies almost exclusively to London City Airport, England (EGLC) and thus reduced the amount of flights to this airport. On the other end, the top increases compared to the year before are Flying Group Luxembourg (FYL) and European Aircraft Private Club (Belgium) (PGC), gaining respectively 39% and 75%. Another increase worth mentioning is the new seasonal connection for Sky Alps (SWU) to Bolzano Airport, Italy (LIPB).[9]

The remaining airlines in the top ten presented in ***Table 1.2*** together with their share of total IFR traffic are: Europilot Center (EPC) with 9%, NetJets Europe (NJE) with 6%, Flying Service (FYG) with 5% and both Air Charters Europe (AGR) and JetNetherlands (JNL) with about 4% each.

7. ASL group introduces the first electric aircraft at Antwerp airport, https://www.aviation24.be/business-jet-operators/asl-group/asl-group-introduces-the-first-electric-aircraft-at-antwerp-airport/ (URL retrieved on 28/02/2025)
8. TUI fly Belgium diverts all Antwerp Airport flights via Brussels, https://www.aviation24.be/airlines/tui-aviation/tui-fly-belgium/tui-fly-belgium-diverts-all-antwerp-airport-flights-via-brussels-due-to-embraer-e195-e2-spare-parts-shortage/ & Antwerp Airport launches new flight to Oujda, https://www.aviation24.be/airports/antwerp/antwerp-airport-launches-new-flight-to-oujda-and-gears-up-for-a-vibrant-summer-season/ (Both URLs retrieved on 03/12/2024)
9. SkyAlps vliegt vanaf 18 december van Antwerpen naar Dolomieten, https://www.gva.be/cnt/dmf20240821_94470466 (URL retrieved on 03/12/2024)

Figure 1.12: *Top 10 international connections map (only IFR)*

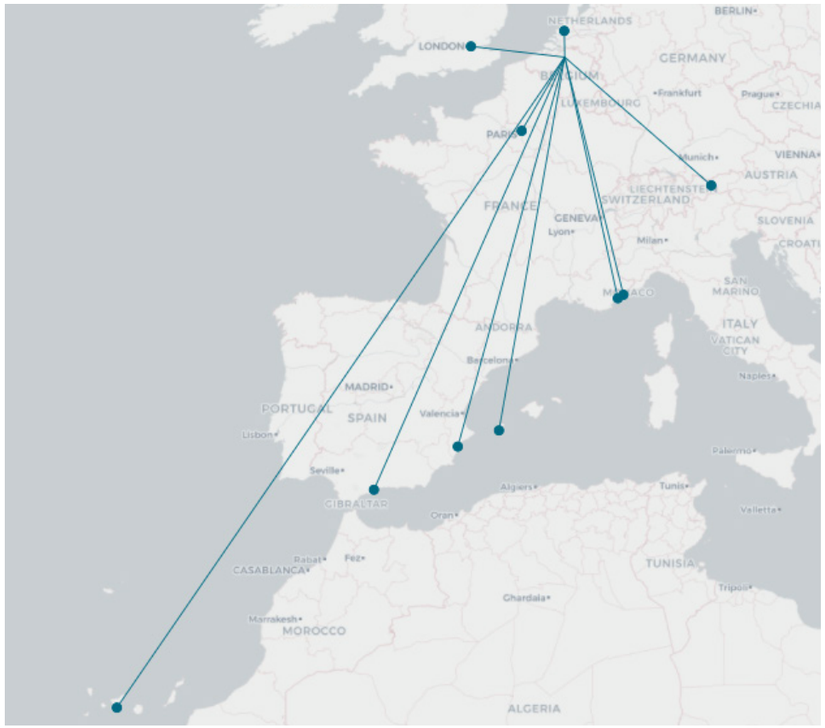
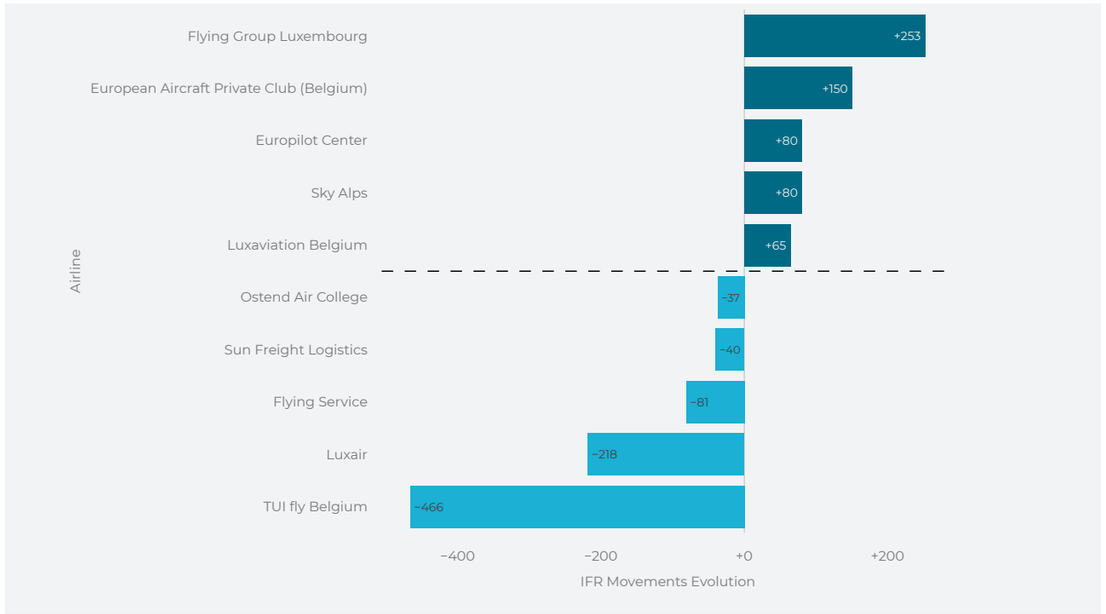


Figure 1.13: *Top 5 airlines' evolution (only IFR)*



BUSINESS AVIATION

The largest group of traffic at Antwerp Airport is classified as Business Aviation. Therefore, a closer look at such movements is taken. For this study, "Business" refers to all IFR movements matching a specific aircraft type and ICAO flight type listed in the STATFOR Business Aviation rules (e.g. specific E135 or E145 with ICAO flight type G).[10] ***Figure 1.14*** and ***Table 1.3*** provide an overview of the yearly evolution of Business traffic compared to other market segments and the share of Business over all IFR traffic. The year of 2022 witnessed higher Business traffic than the year before COVID-19. Since then the number of movements has diminished every year. However, as the total number of IFR movements also declined, the relative share in 2024 was the highest it had been in years. It is important to mention that movements in the Unknown category belong in reality within other market segments. For Antwerp Airport, the 2% of IFR flights that make up this category will have a minor impact upon that presented figures. For the 5,641 movements classified as Business Aviation, the top connections are in France, with airports such as: Cannes–Mandelieu Airport (LFMD), Nice Côte d'Azur Airport (LFMN) and Paris–Le Bourget Airport (LFPB). Although still present, Belgian airports are less prominent, with flights to and from Kortrijk-Wevelgem Airport (EBKT) in the lead throughout the years.

Figure 1.14: *Business movements per year*

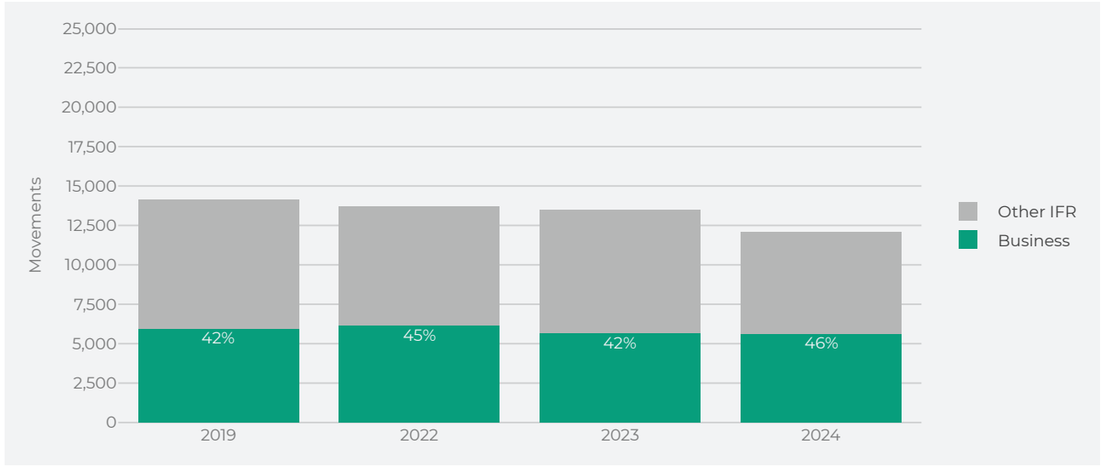


Table 1.3: *Business movements per year*

	Business	Other IFR	% of Business
2019	5,926	8,212	**42%**
2022	6,167	7,547	**45%**
2023	5,671	7,799	**42%**
2024	5,603	6,447	**46%**

10. EUROCONTROL market segment rules, https://www.eurocontrol.int/publication/market-segment-rules (URL retrieved on 17/01/2025)

Drone Activities

The emerging activities of unmanned aircraft systems (UAS) and the variety of their operations is one of the challenges driving the future of Air Navigation Service Providers (ANSP). To enable a reliable and efficient UAS integration, a framework is designed at European Union level: U-space. U-space is a set of specific services and procedures designed to ensure safe and efficient access to airspace for a large number of drones. Implementing U-space airspace requires states to define and designate U-space airspaces with mandatory service provision. For the provision of these mandatory services, the deployment of U-space will entail the integration of two new service providers into the system: the common information service provider (CISP) and the U-space service provider (USSP). The CISP will be in charge of making the common information required available, to enable the operation and provision of U-space services in U-space airspaces wherever it has been designated.[11]

skeyes is playing a central role in the development of the U-space as manager of UAS geographical zones in Belgium and by actively participating in the BURDI Project. The BURDI project which stands for Belgium-Netherlands U-space Reference Design Implementation, is dedicated to implementing a U-space airspace concept to ensure a reliable and efficient UAS integration. The project has been extended until December 2025. Additionally, in 2025, skeyes will receive its certification as the CISP in Belgium. The focus of the BURDI project is above and surrounding the port of Antwerp-Bruges.[12]

The controlled airspace above and around an airport is a Unmanned Aircraft System geographical zone (GeoZone). GeoZone is a kind of zone that is only accessible to drones complying with technical and operational criteria called access conditions, and that can have restrictions with regard to the use of drones. skeyes is the GeoZone manager for controlled airspace above and around the airports of Antwerp, Brussels, Charleroi, Liege, Ostend and the Radio Mandatory Zone of Kortrijk.[13] [14]

A new drone detection system has been installed as a result of the collaboration between skeyes and SkeyDrone. The working methods and procedures to be followed are still being drafted.

11. What is U-space?, https://www.easa.europa.eu/en/what-u-space (URL retrieved 16/02/2024)
12. BURDI project, https://www.sesarju.eu/projects/BURDI (URL retrieved 16/02/2024)
13. UAS geographical zone statuses can be seen at https://map.droneguide.be (URL retrieved on 21/04/2022)
14. skeyes, "skeyes drone service application, https://www.skeyes.be/en/services/drone-home-page/you-and-your-drone/drone-service-application/ (URL retrieved on 21/04/2022)
15. The data extraction method used by SkeyDrone has been update and discrepancies with data from previous years is to be expected.
16. Note that if an operation crosses multiple VLL zones, it will be counted multiple times in the table. ICAO Doc 4444 – PANS–ATM.

The figures in this report related to UAS are provided by the Drone Service Application (DSA) tool. This tool is a web application to facilitate planning, coordination and information flow between drone operators and Air Traffic Control, especially in controlled airspace.[15]

Table 1.4 displays the number of drone activities and the level of risk involved in the operations per airport. These categories are defined by the risk the drone activity forms for manned aviation in very low level (VLL) zones. For all airports where a control zone exists, these are defined as:

VLL0 - high risk → runway and surroundings;

VLL1 - moderate risk → departure/approach track, visual circuits and rest of the control zone 400 ft above aerodrome elevation (AAE), excluding the high risk zone;

VLL2 - low risk → on the edge of the control zone below 400 ft AAE, outside the moderate and high risk zone.

A drone activity can take place in several VLL zones, therefore, it will be counted as one activity for each risk level. This means that the addition of activities in the low, moderate and high risk levels will not provide the total number of activated drone activities in Antwerp Airport CTR.

For Antwerp Airport there was an increase in both moderate and high risk drone activities. These include drone flights over and next to the runway. The activities responsible for this increase were requested by the ANSP and the airport themselves. For skeyes the drone flights were related to the investigation surrounding the possibility of Flemish Digital Towers (DiTo).

Table 1.4: *Activated drone operations per VLL zone risk level*[16]

	Low	Moderate	High
2022	2,872	190	6
2023	3,357	277	16
2024	4,678	497	23
2024 *vs* 2023	+39%	+79%	+44%

In Antwerp Airport area, there were 4,974 drone activities recorded in 2024. Those activities can also be classified into a different scheme, taking into account the complexity of the operation. There are three such categories with activities in Antwerp CTR, which are described as follows (as per EASA definition[17]):

OPEN → Presents low risk to third parties. An authorization from the Civil Aviation Authority (CAA) is not required;

SPECIFIC → More complex operations or aspects of the operation fall outside the boundaries of the Open Category. Authorization is required from the CAA;

FORMER CLASS 1 → Very complex operations, presenting an equivalent risk to that of manned aviation.

Table 1.5 shows the drone operations recorded in Antwerp Airport following the EASA risk category. In Antwerp Airport, almost two-thirds of the drone activities operated under the 'Open' category (2,972 activated operations). 2,002 (40%) were registered as 'Specific'. In 2024, there were 40% more drone operations authorized compared to 2023.

***Table 1.5**: Activated drone operations per EASA risk category*

	Open	Specific	Former Class 1	Total
2022	1,998	1,039	1	**3,038**
2023	2,471	1,074	0	**3,545**
2024	2,972	2,002	0	**4,974**
2024 *vs* 2023	+20%	+86%	-	+40%

Furthermore, ***Table 1.6*** provides the number of exempted flights. These are operations performed by firefighters, police or different federal entities and are a service provided to the state. Most of the 140% increase in exempted drone activities is due to an increase in security related activities.

17. EASA, "Drones - regulatory framework background". https://www.easa.europa.eu/domains/civil-drones/drones-regulatory-framework-background (URL retrieved on 21/04/2022)

***Table 1.6**: Activated exempted drone operations*

	Regular	Exempted	Total
2022	3,017	21	**3,038**
2023	3,483	62	**3,545**
2024	4,825	149	**4,974**
2024 *vs* 2023	+39%	+140%	+40%

Finally, the number of drone operations per type of are shown in ***Table 1.7***. Two type of operations are registered:

VISUAL LINE OF SIGHT (VLOS) → This means the drone is operated within the visual range of the pilot, allowing them to see the drone without any visual aids other than corrective lenses;

BEYOND VISUAL LINE OF SIGHT (BVLOS) → In BVLOS operations, the drone is flown outside the pilot's direct visual range, typically relying on technology such as cameras, GPS, or sensors to navigate and observe the environment.

BVLOS operations are on the rise, in 2024 there were 104 such operations registered at Antwerp airport.

***Table 1.7**: Activated drone operations per type*

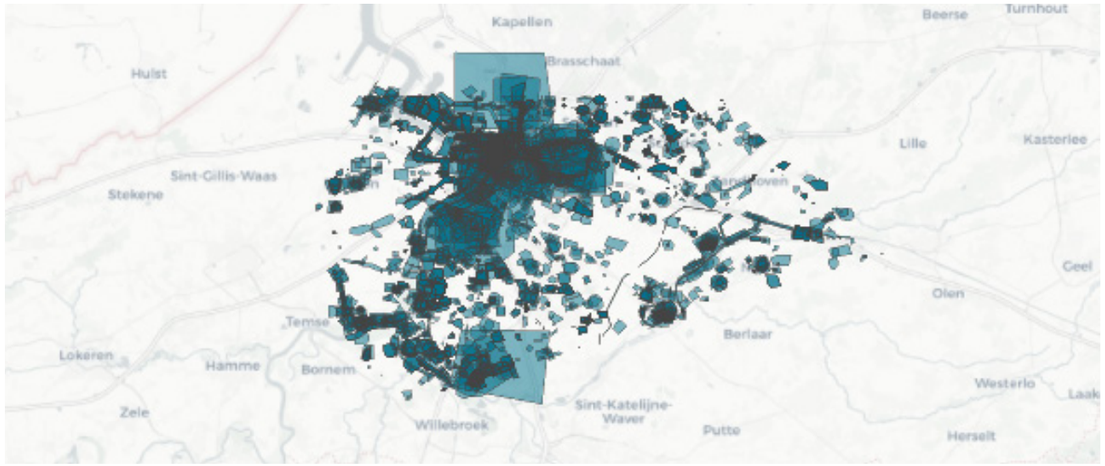
	VLOS	BVLOS	Total
2022	3,036	2	**3,038**
2023	3,511	34	**3,545**
2024	4,870	104	**4,974**
2024 *vs* 2023	+39%	+206%	+40%

In ***Figure 1.15*** the reserved airspace polygons are shown, which were authorized for drone operations in Antwerp Airport's CTR in 2024. The top five activity types in the CTR were:

1. **Related to photo- and videography;**
2. **Photogrammetry** (art, science, and technology of obtaining reliable information about physical objects and the environment through processes of recording, measuring, and interpreting photographic images and patterns of recorded radiant electromagnetic energy and other phenomena);
3. **Aerial photography;**
4. **Inspection missions** (not power line pylon inspection as they are considered in a separate group);
5. **Recreational.**

Looking at the activities as presented in ***Figure 1.15***, a higher concentration of drone activities near Antwerp airport are located above the harbour. This is mostly due to the BURDI project that is focussed around the area. Another significant activity near the airport is the new Oosterweel verbinding, new constructions extending the R1, the ring of Antwerp.[18] The contractors tasked with this mandate make use of drones, and have kept in frequent contact with skeyes and the airport. The TWR of Antwerp Airport has had experience with drone traffic surrounding the airport, and specifically in the north-east of the CTR, towards the port of Antwerp. Therefore is has been chosen to function as a test space for future projects and testing.

Figure 1.15: *Reserved airspaces of activated drone operations in 2024*



18. Oosterweel verbinding, https://www.oosterweelverbinding.be/het-project (URL extracted on 26/02/2025)

2 SAFETY

- **Missed Approaches**
- **Runway Incursions**
- **Other Noteworthy Incidents**
- **Recommendations and Awareness**

This chapter is divided into four topics: missed approaches, runway incursions, other runway (RWY) / taxiway (TWY) events, and recommendations and awareness.

The missed approaches covered in the following chapter are based on internal logging. As such the quality and accuracy of the available information is commensurate with the level of reporting. These logs of missed approaches are not considered as safety occurrences. They are an operational solution allowing to maintain safety margins when the approach cannot be continued for a safe landing. At the same time, particularly during peak hours at busy airports, they also increase the traffic complexity and the residual safety risk. It could be argued that missed approaches are a hybrid leading indicator, and that by analysing the reasons leading to this type of procedure, it is possible to examine if there are any systemic deficiencies in a technical equipment, in a procedure or in manner in which ATCOs and/or pilots apply these procedures.

The runway incursions are a lagging runway safety indicator. The runway incursions and the occurrences discussed in other RWY/TWY events are safety occurrences. These are subject to a risk classification using the Risk Analysis Tool (RAT) methodology to assess the contribution that skeyes had in the chain of events (in accordance with EU Reg 691/2010 and EU Reg 1216/2011[19]). The following chapters indicate the severity classification that was derived from the calculated RAT risk for the safety occurrences.

19. COMMISSION REGULATION (EU) No 691/2010 of 29 July 2010 laying down a performance scheme for air navigation services and network functions;

    COMMISSION IMPLEMENTING REGULATION (EU) No 1216/2011 of 24 November 2011 laying down a performance scheme for air navigation services and network functions;

The following definitions apply for the severity classification (as per EASA Acceptable Means of Compliance (AMC), Annex to ED Decision 2011/017/R).[20] This classification scheme is applicable for the later mentioned operational occurrences. In 2024, skeyes updated the data extraction method. This can generate small differences with the numbers published in previous reports.

Table 2.1: *Severity classification*[21]

Severity Classification	Description
A – Serious incident	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.
B – Major incident	An incident associated with the operation of an aircraft, in which the safety of the aircraft may have been compromised, having led to a near collision between aircraft, with ground or obstacles (i.e. safety margins were not respected; in this case, not as a result of an ATC instruction).
C – Significant incident	An incident involving circumstances indicating that an accident, or a serious or major incident could have occurred if the risk had not been managed within the safety margins, or if another aircraft had been in the vicinity.
D – Not determined	Insufficient information was available to determine the risk involved or inconclusive or conflicting evidence precluded such determination (RAT RF < 70 %).
E – No safety effect	An incident which has no safety significance.
N – No ATM ground contribution	No system, procedure or person involved in the provision of ATC services initiated or contributed to the incident.

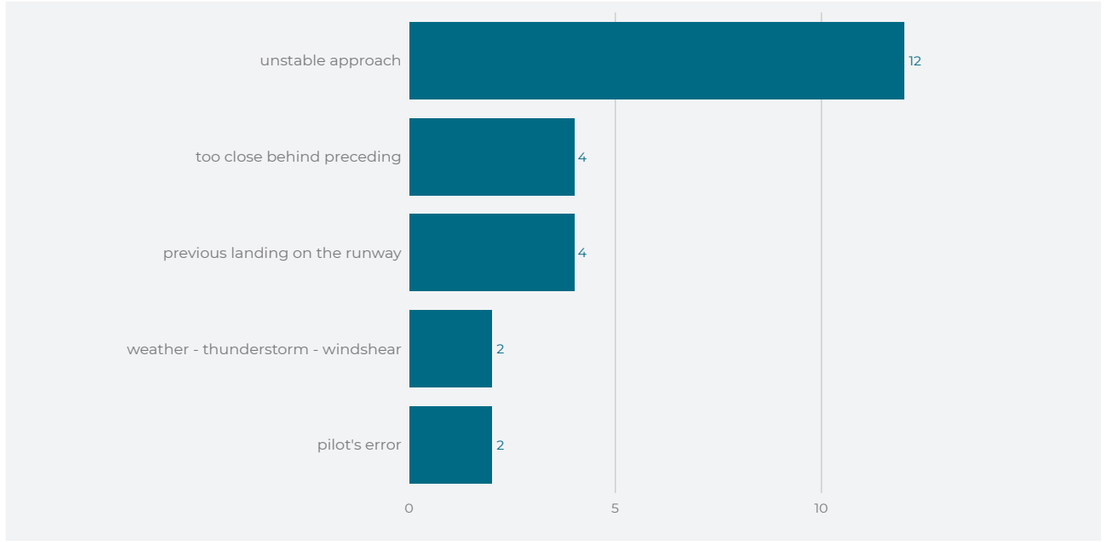
Missed Approaches

A missed approach is performed according to published procedures and it is performed under the instructions of the air traffic control officer or after initiation by the pilot when the approach cannot be continued for a safe landing. Besides the discomfort for passengers and crew, missed approaches increase the air traffic management complexity. The number of missed approaches and particularly the cause, can give an indication of which measures are to be taken to improve the safety of air navigation service provision. The missed approaches are recorded by cause of event, and the internal reporting is done by the ATCOs.

In 2024, there were 31 missed approaches, ***Figure 2.1*** shows the number of missed approaches per cause, for the five most common causes. The remaining causes can be found in ***ANNEX A: Missed approaches***. Unstable approaches were the main reason of missed approaches at Antwerp Airport, accounting for a share of 39%. Many training flights happen at Antwerp Airport and inexperienced pilots can cause unstable approaches. On top of that, as can be seen in ***Figure 4.3*** in the Environment chapter, the large crosswind component of most winds at the airport contributes as well.

20. Acceptable Means of Compliance and Guidance Material for the implementation and measurement of Safety Key Performance Indicators (SKPIs) (ATM performance IR)
21. UI – under investigation (a non-official severity classification used during investigation before a final classification is determined)

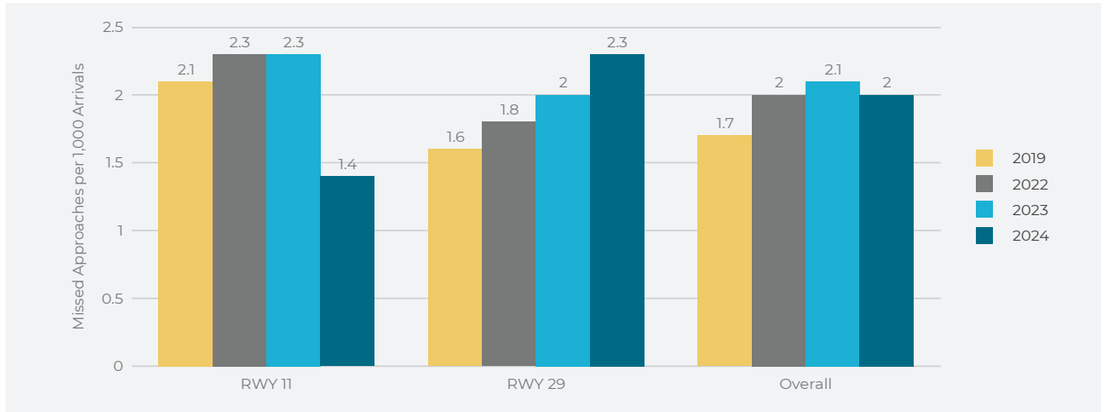
Figure 2.1: *Top 5 causes for missed approaches in 2024*



The number of missed approaches has gone down by 8% in 2024 compared to 2023. Rather than comparing absolute numbers, looking into the rate of missed approaches per 1,000 arrivals is more convenient for comparison purposes. The number of arrivals is provided by the AMS under the BCAA's aerodrome movement definition. Compared to 2023, the rate of missed approaches declined by 0.1 per 1000 arrivals (see ***Figure 2.2***). This means that the overall rate has remained similar over the last three years, yet there are differences for each runway configuration separately. The rate of missed approaches for runway 11 improved considerably compared to 2023 values. Meanwhile for runway 29 the rate increased for the third year in a row. In total, there were eight missed approaches reported on runway 11 and 23 missed approaches on runway 29.

Further details can be found in the ***ANNEX A: Missed approaches***, which shows missed approaches per cause for each runway in the years of 2022 until 2024 and the reference year of 2019.

Figure 2.2: *Rate of missed approaches per 1,000 arrivals per runway per year*



Runway Incursions

As mentioned in this chapters introduction, this section highlights one of the categories of safety occurrences: the runway incursions.

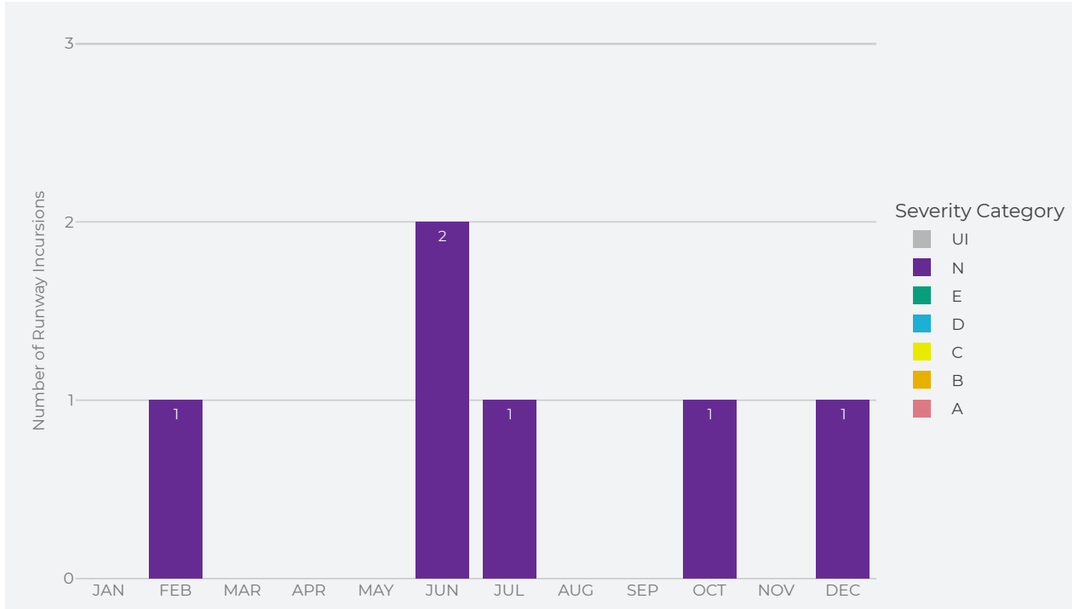
According to the International Civil Aviation Organization (ICAO Doc 4444 – PANS–ATM), a Runway Incursion is defined as "any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft".[22]

According to the Acceptable Means of Compliance (AMC), an incorrect presence is hereby defined as "the unsafe, unauthorised or undesirable presence or movement of an aircraft, vehicle, or pedestrian – irrespective of the main contributor (e.g. ATC, pilot, driver, technical system)".[23]

A monthly overview of the runway incursions in 2024 can be retrieved from ***Figure 2.3***. In total there were six runway incursions of which none had any air traffic management (ATM) contribution. All incidents were cases where a pilot failed to follow a clearance or proceeded without getting one. The incident in October, when an aircraft failed to follow the instruction to start rolling three times, caused another aircraft to perform a go around.

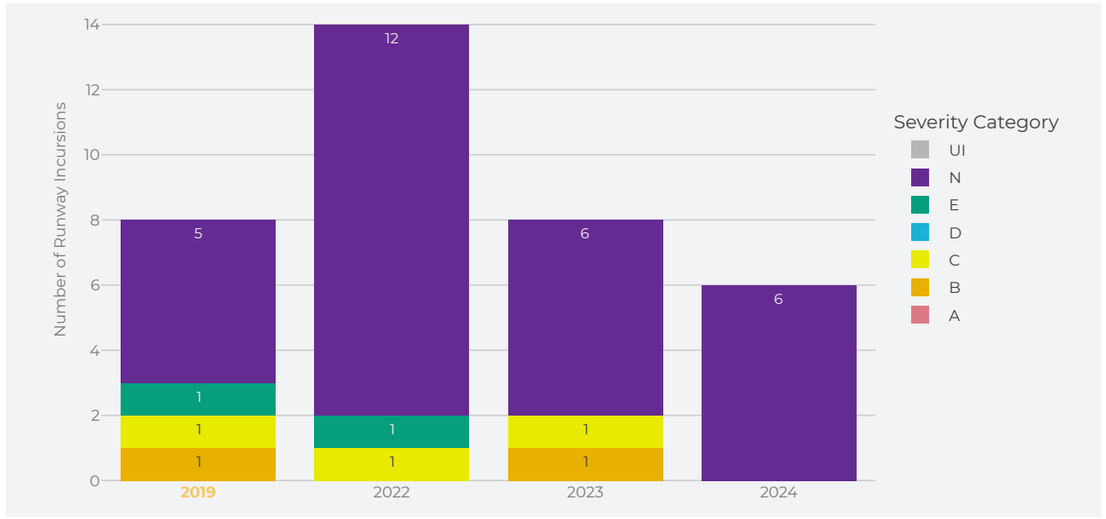
Figure 2.4 shows a yearly evolution of the number of runway incursions from 2022 to 2024 and the reference year of 2019. As there were no severe incidents in 2024, this shows an improvement when it comes to ATM relating safety. One of the measures to improve these numbers was a phraseology refresher held in February. All of the runway incursions were due to deviations from ATC instructions.

Figure 2.3: *Monthly runway incursions per severity category*



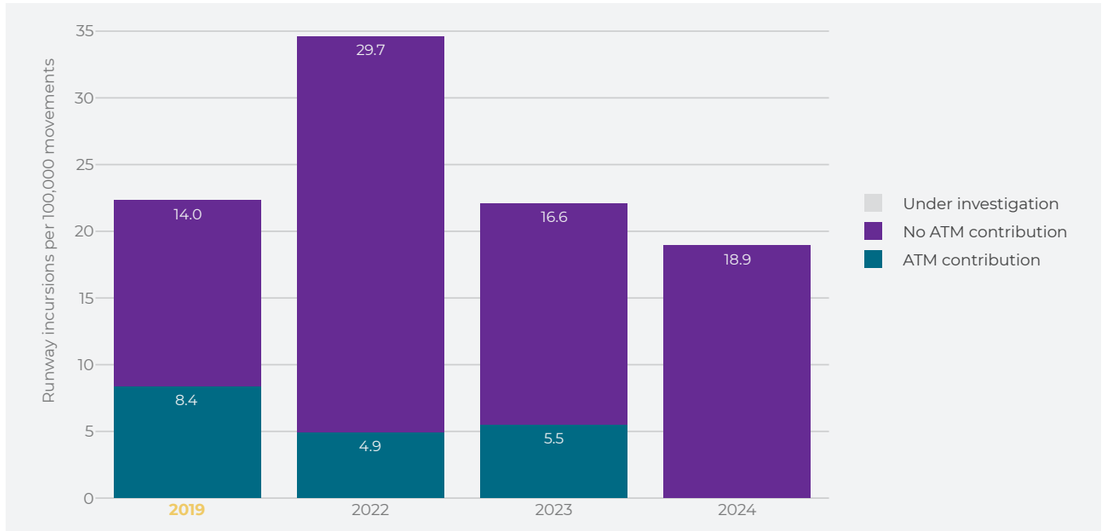
22. ICAO Doc 4444 – PANS–ATM
23. AMC 3 of EU Reg 2019/317

Figure 2.4: *Yearly runway incursions per severity category*



A better way of comparing these figures is by looking at the rate of runway incursions per 100,000 movements. ***Figure 2.5*** shows this rate for Antwerp Airport for the period from 2022 until 2024 and the reference year of 2019. There has been a decrease of runway incursions for two years in a row. On top of this, as mentioned above, there were no incidents with ATM ground contributions. On the other hand, the amount without ATM ground contributions has grown with 2.3 per 100,000 movements.

Figure 2.5: *Yearly rates of runway incursions per 100,000 movements by ATM contribution*

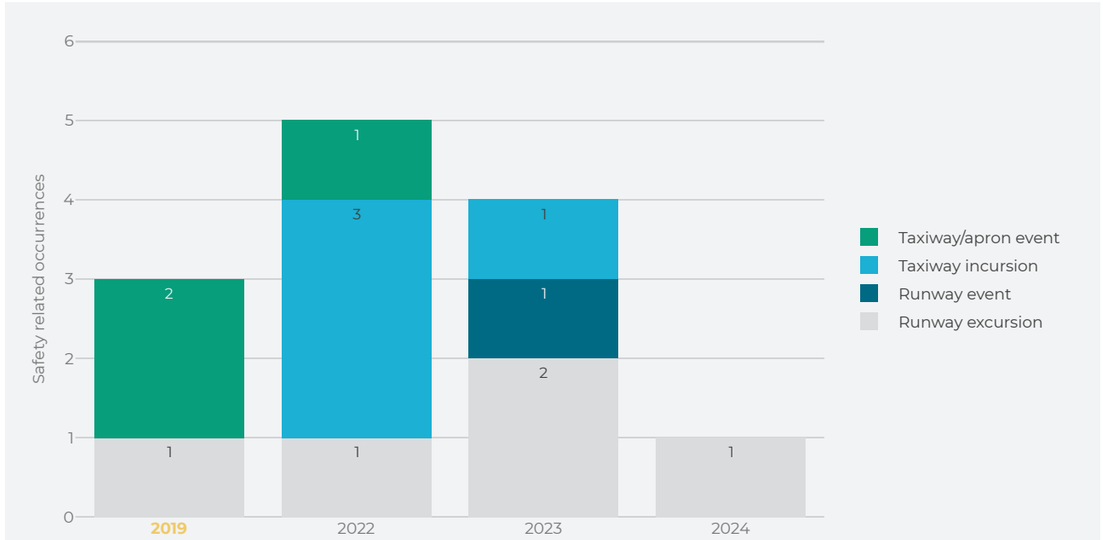


Other Noteworthy Incidents

All safety occurrences are closely monitored and registered by skeyes. The year 2024 was an interesting year safety wise at Antwerp Airport. As mentioned before, there were no runway incursions with ATM ground contribution. In similar fashion this year also had no runway events, no taxiway incursions, nor any taxiway or apron events. The only incident of note was a runway excursion. In February, an arriving aircraft was seen swerving to the left while braking and, as a result, exited the runway at low speed. As the aircraft continued rolling, it was able to re-enter by itself. Afterwards, the aircraft reported a brake problem, but was able to taxi without any complications. The runway was inspected, having no damage or issues of any kind to be reported.

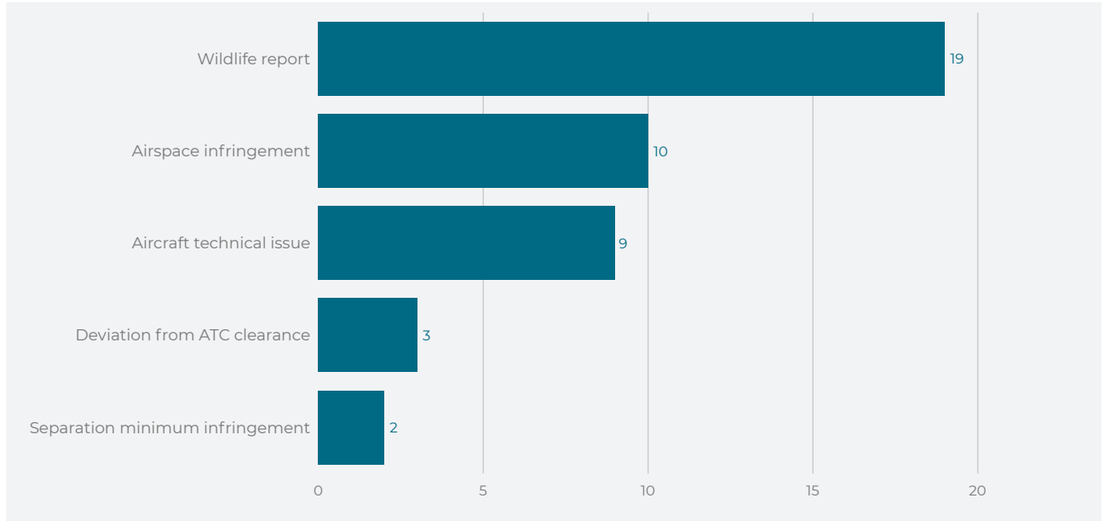
Figure 2.6 provides an overview over the previously mentioned incident, and other incidents from the past three years, as well as the reference year of 2019. It is worth mentioning that 2024, with one runway excursion, is the year from the selected period with the least incidents.

Figure 2.6: *Yearly runway and taxiway safety events*



Apart from taxiway and runway incidents, there are many other safety occurrences that are monitored by both the airport and skeyes. ***Figure 2.7*** presents the top five most common safety occurrences, except for those mentioned previously. The 19 wildlife reports were mostly birdstrikes. When an arriving or departing aircraft hits a bird, it needs to be cleaned up. This might cause the aircraft to abort a take-off and could even damage the vehicle. Apart from the top five most numerous safety occurrences presented in this figure, there is one other incident of note. On the 28th of June there was a bomb threat at Antwerp Airport. A call came in from the police regarding a helicopter. After this helicopter returned to the airport, it was kept grounded and for a while the airport was closed. Once the taxiways leading to the aircraft were closed off, the airport resumed its business until a specialised police team could arrive. As soon as they did, all traffic was halted and the airport closed again. The police team staged a successful intervention followed by safety checks, allowing the airport and taxiways to fully reopen, two and a half hours after the initial phone call.

Figure 2.7: *Top safety occurrences in 2024*



Reports from pilots being inconvenienced by laser beams, or users spotting unauthorized unmanned aircraft systems (UAS), widely known as drones, are also closely monitored. ***Table 2.2*** shows the evolution of these safety occurrences per year. Laser beam incidents have led to more cooperation measures with the local police, informing them promptly when one is reported. In both categories improvements have led to only two instances of reported laser beams and zero reported RPAS in 2024.

Table 2.2: *RPAS and lasers incidents per year*

Safety occurrence	2019	2022	2023	2024
RPAS	6	4	4	-
Laser beam	1	8	5	2

Improvements And Recommendations

Runway Safety Team fostering shared safety culture

Following every runway incursion, an investigation is conducted at skeyes. The Local Runway Safety Team (LRST) – SAFCA hold meetings organised by the airport to discuss the events thoroughly. All stakeholders are present in those meetings (flying schools, aircraft operators, handling agents, airport, skeyes, and others). Discussing the runway incursions and the recommendations resulting from the investigations during these meetings creates an overall safety awareness to all stakeholders.

Collaborative mitigation efforts at the Airport

In 2024, a unit debriefing was organised during the refresher course in February in order to brainstorm with all Antwerp Airport controllers. The purpose was to come up with possible mitigations aligned to the needs of their unit to prevent incorrect landing clearances while the runway is occupied. The outcome has been presented to the Safety Review Board. Currently a working group will elaborate further.

Shaping future airspace with PBN

skeyes designed a PBN (Performance Based Navigation) implementation and transition plan describing the way ahead to 2030. The purpose of the transition and implementation plan 2024/2030 is the establishment of a full PBN environment within the Belgian part of the Brussels FIR and at the aerodromes of Antwerp, Brussels, Charleroi, Kortrijk, Liège and Ostend. Once the full PBN environment is realized, an optimization of this PBN environment will be initiated. This comprises the redesign of airspace as well as the routes which can then be redesigned independently from the ground-based infrastructure and placed at the most strategically beneficial location.

Progress and limitations in stop bar implementation

In addition, in 2024, two stop bars have been installed at Antwerp Airport. At this time the intention is to use these stop bars during Low Visibility Procedures (LVP). The usage of the stop bars can proceed once the contingency procedure in case of stop bar failure is approved. The installation was triggered by a recommendation from a safety incident to use the stop bars 24/7. This recommendation included the use of stop bars outside of Low Visibility Operations (LVO), during aerodrome opening hours, in order to prevent the occurrence of runway incursions. For this recommendation to be implemented, more stop bars need to be installed, and they need to be included in the AMS. Currently there is no intention to do so.

2 CAPACITY & PUNCTUALITY

This chapter addresses airport capacity and punctuality. In the first section, the declared capacities for different runway configurations are given along with a view on the effective utilisation of this capacity.

In the second section, the punctuality at Antwerp Airport is studied. The arrival delay, delay due to regulations placed by Antwerp Airport on the arrivals, is analysed and the Air Traffic Flow Management (ATFM) delay from the airport's point of view is given, i.e. the impact on traffic to or from Antwerp Airport caused by regulations, not only at Antwerp Airport, but also in the Belgian en-route airspace and by other ANSPs.

Airport Capacity

The capacity of an aerodrome, defined as the number of operations it can handle in a given time, is influenced by factors such as airport layout, fleet mix of the arriving and departing traffic, ATC procedures, weather conditions and technological aids. Under optimal conditions, a theoretical measure, called **Theoretical Capacity Throughput**, is calculated for each runway configuration. This represents the average number of movements (arrivals and/or departures) that can be performed on the runway system within one hour, based on certain assumptions:

- *A continuous supply of arrivals and/or departures;*
- *Simultaneous Runway Occupancy (SRO) is prohibited (ATC rule);*
- *Safe Wake Vortex separation distances between flights are maintained (ATC rule);*
- *A static fleet mix (unchanging aircraft types);*
- *Unchanging approach and departure procedures;*
- *Optimal operational conditions (e.g., weather and staffing).*

The calculation also incorporates the following parameters:

- *The fleet mix from a monthly sample of traffic;*
- *A nominal radar separation of three NM;*
- *A 15% loss factor in inter-arrival times to account for conservative separation by controllers;*
- *Assumptions for the average Runway Occupancy Time for Arrivals (ROTA);*
- *An average approach speed of 136 knots (adjusted for headwind per runway);*
- *Inter-departure time, determined by the time between take-off clearance and reaching a specified altitude.*

Since safe wake vortex separation distances are specified only for IFR flights, the Theoretical Capacity Throughput applies exclusively to IFR movements, and represents the highest number of IFR movements that an aerodrome can handle per hour with a given runway configuration under ideal conditions.

In practice, optimal conditions are rarely achieved. To account for this, the **Declared IFR Capacity** is set at 90% of the theoretical maximum. ***Table 3.1*** shows the declared IFR capacity per runway configuration at Antwerp Airport. Note that this is only a theoretical calculation and currently not used for schedule coordination purposes.

Table 3.1: *Declared IFR capacity*

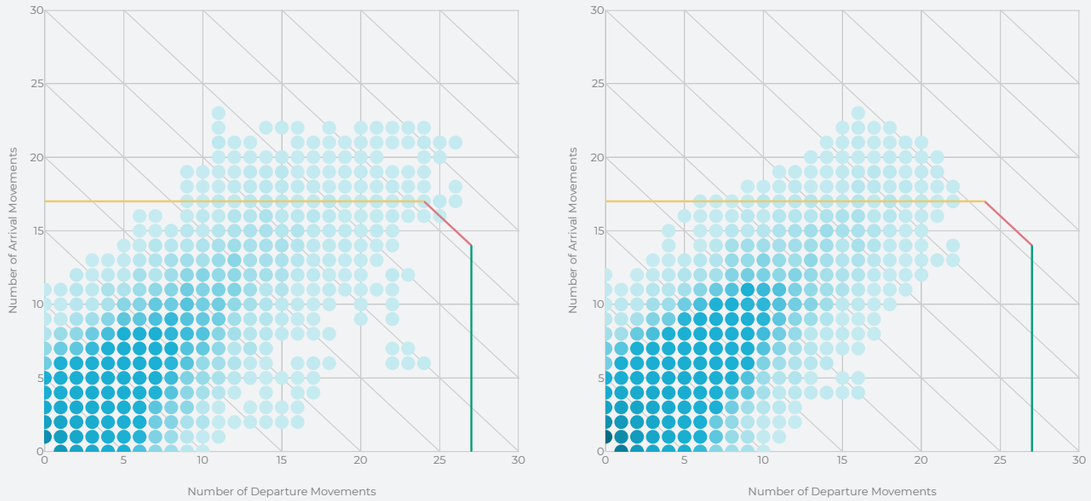
Runway Configuration		Declared IFR Capacity (movements/hour)		
Departures	Arrivals	Only Departures	Only Arrivals	Mixed Fleet
11	11	27	17	41
29	29	27	17	41

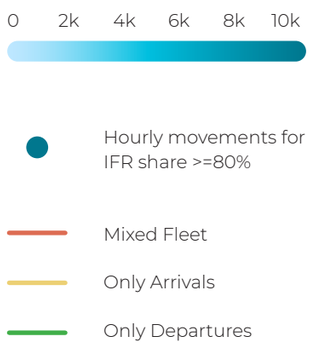
Figure 3.1: *Hourly movements for configuration 11-11*

Figure 3.2: *Hourly movements for configuration 29-29*

Figure 3.3: *Hourly movements of hours with 80% IFR movements for configuration 11-11*

Figure 3.4: *Hourly movements of hours with 80% IFR movements for configuration 29-29*





To get a view on the actual usage of the aerodrome's capacity, the **Effectively Used Capacity** is an important performance indicator for the airport and the air navigation service provider handling the arrivals and departures. For each runway configuration, it compares the theoretical value of the declared capacity to the distribution of the actual number of movements performed within each hour of the year.

Figure 3.1 and ***Figure 3.2*** provide a way to visually inspect if the declared capacity has ever been exceeded on runway 11 and runway 29 respectively. In these plots, each dot represents a rolling hour throughout the year of 2024 (with a roll step of one minute), during which the runway configuration was active for at least an hour within the default opening times of the aerodrome and during which there was at least one movement. The measuring points with no arrivals and no departures are disregarded in the graph. The position of the dot indicates the number of arrivals (y-axis) and the number of departures (x-axis). The opacity of the dot indicates if there were many or few hours with this number of arrivals and departures, with more translucency indicating less hours. The histograms below the charts show the distributions of arrivals and departures. The mixed fleet declared capacity is shown by a diagonal red line: At any point on this line, the x-axis value (departures) and y-axis value (arrivals) will add up to the threshold number (total movements). The declared capacity for only departures is shown with a green vertical line and the declared capacity for only arrivals is shown with a yellow horizontal line. Any dot above this line indicates an hour exceeding the declared capacity.

Even though the capacity is only declared for IFR movements, the plots consider both IFR and VFR movements. This is because only considering IFR flights would give a distorted view on the number of hourly movements – especially for airports with high VFR shares. The notation for the runway configurations in this report always mentions first the departure runway, then the arrival runway, separated by a hyphen.

In 2024, the declared capacity for a mixed fleet was exceeded 54 times at Antwerp Airport.[24] This is less than one third of capacity exceedance in 2023. All of these rolling hours were during runway configuration 11–11. The maximum movements in one hour was recorded on the 12th of May 2024 with 47 movements, exceeding the declared capacity by six movements. At that time, 91% of movements were VFR. This is not unusual, as the 12th of May was the second day of the Stampe Fly airshow.

The capacity plots displayed in ***Figure 3.1*** and ***Figure 3.2*** are different from previous reports. As mentioned in the explanation previously, the declared arrival and declared departure capacities are added as, respectively, a yellow and green line. For neither runway configuration the declared capacity, on its own, was exceeded in 2024. However, the lower arrival capacity of 17 movements per hour was exceeded a number of times. For an airport with a large share of VFR traffic, such as Antwerp Airport, these plots do not accurately present the traffic capacity, as such a different approach to capacity is presented in ***Figure 3.3*** and ***Figure 3.4***.

24. Keep in mind that this number is the amount of rolling hours with steps of one minute, this causes a lot of overlap between each.

A more relevant way of presenting the capacity exceedance for Antwerp Airport is presented in ***Figure 3.3*** and ***Figure 3.4.*** They show the hourly movements in 2024 for hours with ≥80% of the traffic being IFR, respectively for runway configuration 11–11 and for runway configuration 29-29. Hours where IFR movements were equal to or more than 80% of the total traffic per hour are thus hours for which the declared IFR capacity is relevant. In 2024 the declared capacity is never reached for rolling hours with ≥80% IFR traffic.

Table 3.2: *Days with hours exceeding the declared capacity*

Runway Configuration		Date	Maximum	% of IFR	% of Departures
Departures	Arrivals	of Occurrence	Extra Movements	at Occurrence	at Occurrence
11	11	May. 12	6	6%	55%
		Jun. 25	2	5%	49%
		Jun. 26	3	5%	59%

Table 3.2 gives figures on the days where the amount of mixed traffic exceeded the declared capacity. As the calculation is based on a rolling hour per minute, each instance represents one of those rolling hours, hence the 54 instances of exceedance recorded as mentioned before. The table gives a summary in terms of extra movements, share of IFR traffic and share of departures.

In 2024, three days saw capacity exceedances, all three occurred during runway configuration 11-11. The number of days where the capacity was surpassed decreased from 12 in 2023. The capacity is only declared for IFR movements and therefore having VFR movements, for which the IFR separation rules do not apply, can result in exceeding the declared capacity.

Punctuality

Punctuality can be seen as a service quality indicator from a passenger perspective. This section observes one of the factors that influences the punctuality: Air Traffic Flow Management (ATFM) delay. ATFM delay is defined as the time difference between estimated take-off time (ETOT) and calculated take-off time (CTOT) of the NM (Network Manager, EUROCONTROL) and is due to ATFM measures that are classified according to the respective causes listed below:

A - Accident
C – ATC Capacity
D - De-icing
E - Equipment (non-ATC)
G – Aerodrome Capacity
I - Industrial Action (ATC)
M - Airspace Management
N - Industrial Action (non-ATC)
O - Other
P - Special Event
R – ATC Routeing
S – ATC Staffing
T - Equipment (ATC)
V – Environmental Issues
W - Weather
NA - Not Specified

The ATFM measures with Air Navigation Service Provider (ANSP) contribution are listed according to the Functional Airspace Block Europe Central (FABEC) performance plan[25]:

C – ATC Capacity
R – ATC Routeing
S – ATC Staffing
T - Equipment (ATC)
M - Airspace Management
P - Special Event

In the remainder of the report, all causes with ANSP contribution are referred to as CRSTMP. Additionally, the measures due to W – Weather are split in a separate category, resulting in three aggregated categories: CRSTMP, Weather and Other categories. The following section focusses on a key performance indicator: arrival delay. The Airport Arrival ATFM Delay is an indicator of ATFM delays on ground for a flight, due to a regulation placed by the airport of arrival. After this, the next section of this chapter provides an overview of the influence of ATFM measures on traffic arriving to or departing from Antwerp Airport, regardless of which unit placed the regulations.

25. A common FABEC Performance plan https://www.fabec.eu/who-we-are/optimised-performance/a-common-fabec-performance-plan (URL retrieved on 25/02/2025)
26. EUROCONTROL, "SES Performance Scheme Reference Period 3 (2020-2024), 2022, https://www.eurocontrol.int/prudata/dashboard/metadata/rp3/ (URL retrieved on 19/04/2023)
27. European Commission, "Regulations," Official Journal of the European Union, p. 67, 2019
28. Hence the difference with figures in the Traffic chapter, where movements are counted using the AMS and the BCAA criteria. The Network Manager only accounts for flights with a registered flight plan.

AIRPORT ARRIVAL ATFM DELAY

As of January 1st, 2015, skeyes is subject to an annual target with regard to ATFM arrival delay. ATFM arrival delay is the delay of a flight attributable to terminal and airport air navigation services and caused by restrictions on landing capacity (regulations) at the destination airport. The average minutes of arrival ATFM delay per flight is a performance indicator in accordance with the European Performance Regulation (EU) no 317/2019, Annex 1, section 1, §3.1(b). This indicator is the average time, expressed in minutes, of arrival ATFM delay per inbound IFR flight and is calculated for the whole calendar year. The indicator includes all IFR flights with an activated flight plan submitted to the Network Manager landing at the destination airport and covers all ATFM delay causes excluding exceptional events.[26]

Targets are set on a national level and on an airport level, where the national target is the aggregation of the airport targets. For reference period 2, 2016-2019, the national target was 0.10 minutes/flight, and Brussels Airport and Liège Airport were considered as contributing airport. For reference period three (RP3), 2020-2024, the national target was initially 1.82 minutes/flight for all causes and 0.17 minutes/flight for CRSTMP causes with Brussels Airport the only contributing airport. However, due to the unexpected impact of COVID-19 on the air traffic, the European Commission requested a revision of Union-wide performance targets for RP3. The current proposal only includes arrival delay targets for Belgium as of 2022 (1.08 minutes/flight all causes and 0.12 minutes per flight for CRSTMP causes), and the only contributing airport remains Brussels Airport.

In 2025 the new reference period four (RP4), 2025-2029, starts. The new targets set for this period will bring a change on how the delay for the target is calculated. For RP3 the target was set on minutes/flight for CRSTMP causes, but this will change in RP4 as the target will be set on minutes/flight for all causes.

Despite not having its own target, skeyes registers the arrival delays for Antwerp Airport as part of a continuous monitoring of the ANSP's performance and internal performance indicator. This indicator is the average time, expressed in minutes, of arrival ATFM delay per inbound IFR flight and is calculated for the whole calendar year. The indicator includes all IFR flights with an activated flight plan submitted to the Network Manager landing at the destination airport and covers all ATFM delay causes excluding exceptional events.[27]

For this performance indicator, a comparison is made over the last three years and the reference year of 2019. ***Table 3.3*** gives the amount of arrival delay of Antwerp Airport and the total number of arrivals per year. Note that in this section, the number of arrivals and the arrival delay for each flight are calculated by the Network Manager and have been provided by the Performance Review Unit (PRU / EUROCONTROL).[28]

The last arrival delay registered at Antwerp Airport was in 2018, this makes 2024 the sixth year in a row without any registered arrival delays.

Table 3.3: *Number of IFR arrivals and minutes of arrival ATFM delay per reason and per year (with flight plan)*

	Minutes of ATFM Arrival Delay				IFR Arrivals
	CRSTMP	Weather	Other categories	Total	(with flight plan)
2019	0	0	0	0	6,563
2022	0	0	0	0	6,507
2023	0	0	0	0	6,029
2024	0	0	0	0	5,624

ALL ATFM IMPACT ON TRAFFIC AT ANTWERP AIRPORT

Besides being delayed by Antwerp tower, flights to or from Antwerp Airport can also be delayed by ATFM measures in any ATC sector along their flight route; i.e. en-route or at the other departure or arrival airport. The impact of all these regulations give the total ATFM delay of traffic at Antwerp Airport.

In 2024, compared to 2023, traffic in Europe increased by 5%, reaching 96% of the 2019 traffic level. According to an overview published by EUROCONTROL the ATFM delays in terms of delay per flight was 18% higher than in 2023, despite a significant reduction in strike-related delays. In general, there was a strong recovery in traffic in 2024. The increase in ATFM delays is mainly a result from adverse weather and a lack of capacity.[29]

Figure 3.5 and ***Figure 3.6*** present an overview of the ATFM delay on arriving and departing flights at Antwerp Airport over the past three years, including the reference year 2019. Delay is attributed to the regulation originating it. For flights with Antwerp Airport as origin and destination, if they are impacted by any regulation, the delay is counted in the arrival delay and in the departure delay, as those flights are considered arrivals and departures to/from the airport. As a result, the total ATFM delay is not the sum of delays recorded for arrivals and departures, as this will count delays for the flights with origin and destination Antwerp Airport twice.

In 2024, 5,624 IFR flights (with a flight plan) arrived at Antwerp Airport of which 712 were delayed for a total of 13,836 minutes of ATFM delay. This is a decrease of 7% compared to 2023 in terms of total arrival delay, and 20% below pre-COVID levels in 2019. Of the total amount of ATFM delay 3% (474 minutes) is attributable to skeyes while 97% (13,362 minutes) is attributable to ATFM measures placed by other ANSPs.

Of the 5,616 IFR departures from Antwerp Airport, 654 flights were delayed by ATFM regulations resulting in a total of 11,710 minutes of delay. This is an increase of 27% compared to 2023 in terms of total departure delay, and similarly 28% below the delay of 2019. For departing traffic 6% (760 minutes) of this delay is attributable to skeyes while 94% (10,950 minutes) is attributable to other ANSPs.

Figure 3.5: *ATFM delay for IFR arrivals per year and delay origin*

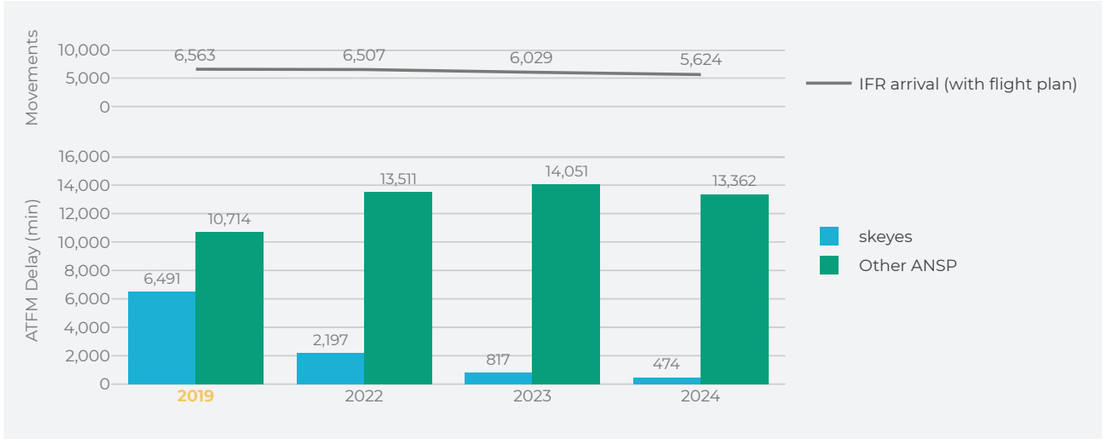
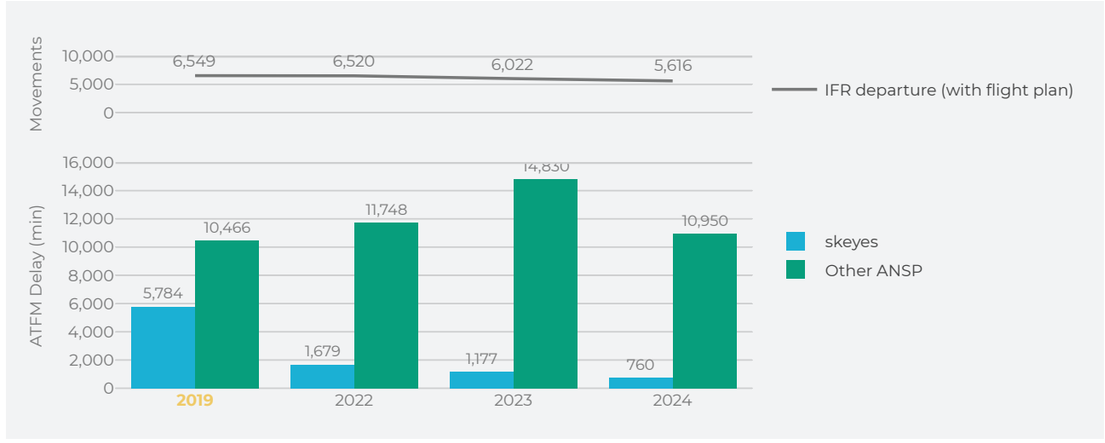


Figure 3.6: *ATFM delay for IFR departures per year and delay origin*



29. **EUROCONTROL European Aviation Overview,** https://www.eurocontrol.int/publication/eurocontrol-european-aviation-overview
(URL retrieved on 23/01/2025)

The impact of all these regulations gives the total ATFM delay of traffic at Antwerp Airport. Traffic was mainly impacted by ATC disruptions due to a lack of capacity and weather related reasons. The third most common cause was due to staffing issues primarily by the French ANSP, Direction des Services de la navigation aérienne (DSNA). Amongst other factors, that resulted in ATFM delay on Antwerp traffic, were the trials for the implementation of 4-Flight in France (the new ATM system that will be implemented by the DSNA for their traffic management) and similarly the continued implementation of iCAS (also a new ATM system) in Germany, by the Deutsche Flugsicherung (DFS).

To give a view on the severity of the impact, the delayed flights can be categorised based on the length of their delay. The following four categories have been established:

- *Between 1 and 15 minutes;*
- *Between 16 and 30 minutes;*
- *Between 31 and 60 minutes;*
- *More than 60 minutes.*

It is clear that for both arriving traffic (***Figure 3.7***) and departing traffic (***Figure 3.8***), a similar distribution is seen:

More than half of delayed flights going to Antwerp Airport had a delay that did not exceed 15 minutes (53%). For 81%, the delay was below 30 minutes and only 4% of flights going to Antwerp Airport were delayed by more than 60 minutes.

Similarly, more than half of delayed flights departing from Antwerp Airport had a delay that did not exceed 15 minutes (56%). For 84%, the delay was below 30 minutes and 3% of flights departing from Antwerp Airport were delayed by more than 60 minutes.

Figure 3.7: *Delayed IFR arrivals per category of delayed time*

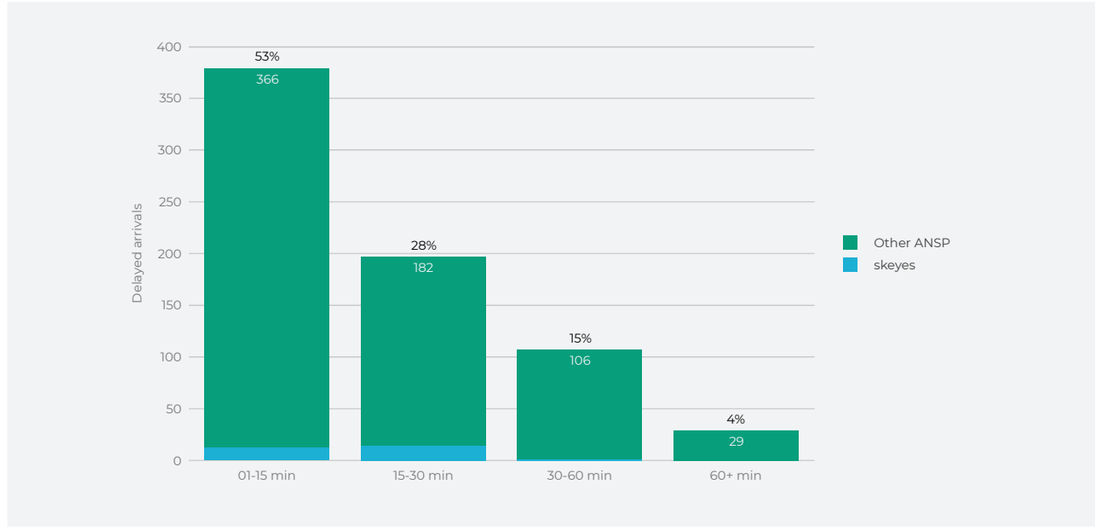
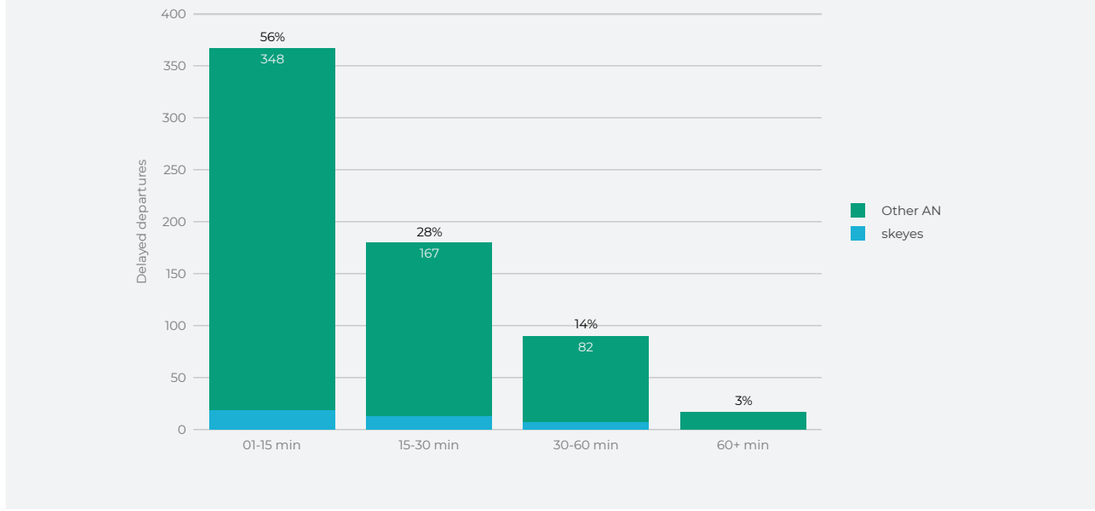
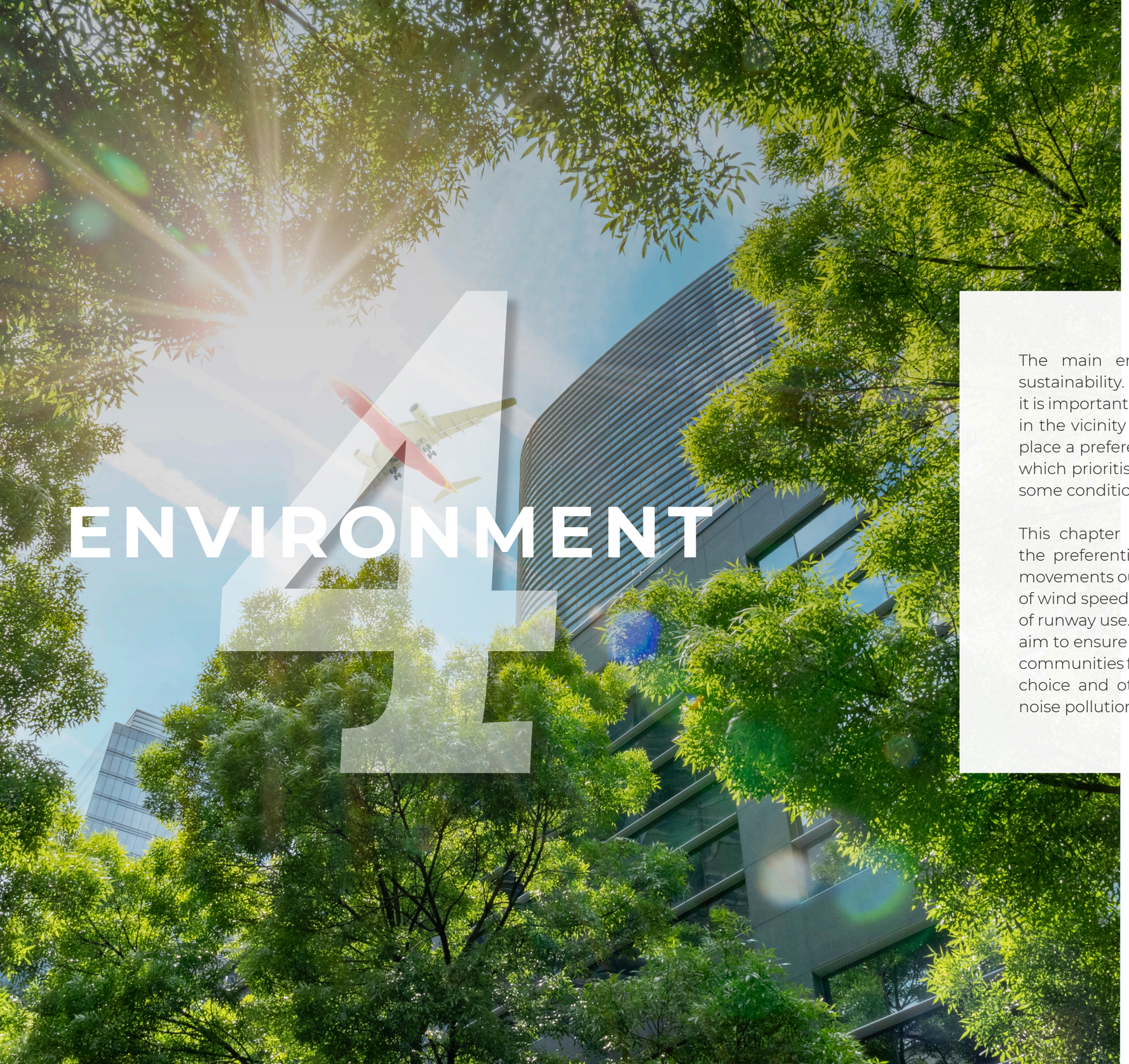


Figure 3.8: *Delayed IFR departures per category of delayed time*





11 ENVIRONMENT

- **Preferential Runway System**
- **Night Movements**
- **Wind Patterns**
- **Considerations and Improvements**

The main environmental effects of aviation are noise and sustainability. As Antwerp Airport is located near populated areas, it is important to consider noise and its reduction, as far as possible, in the vicinity of the airport. One of the ways to do so is to put in place a preferential runway system, a decision taken by the BCAA, which prioritises a certain runway use above the other, given that some conditions, mainly weather-driven, are met.

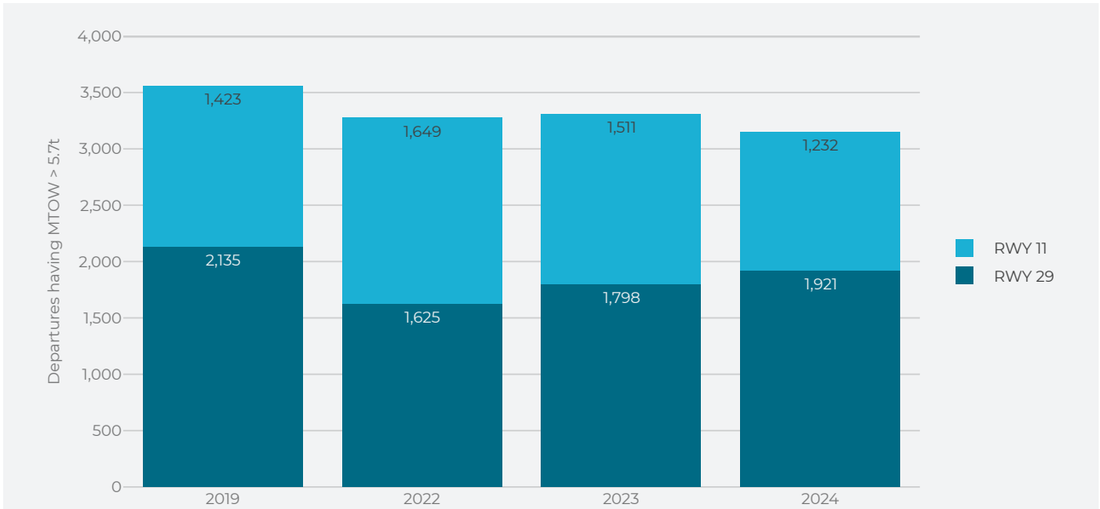
This chapter addresses, in the first part, the compliance with the preferential runway system in Antwerp Airport, followed by movements outside of normal operating hours. Next is an overview of wind speed and direction, as wind is a major factor in the choice of runway use. The chapter concludes with ongoing processes that aim to ensure a continuous dialogue with all the stakeholders and communities for more and more clarity in the runway configuration choice and other incentives, like environmental fees, to reduce noise pollution.

Preferential Runway System

As mentioned in the AIP[30], the following Preferential Runway System (PRS) is in place at Antwerp Airport: with weather and traffic permitting, aircraft with weight exceeding 5,700kg shall use runway 11 in preference to runway 29 when departing.

Figure 4.1 shows the number of departures for the two runways, runway 11 and runway 29, of aircraft whose Maximum Take-Off Weight (MTOW) exceeds 5.7 tonnes. In 2019, the PRS was followed by 40% of these movements. Since then it reached its best result in 2022, with 50% of eligible flights able to adhere to the PRS. However this has declined over the past two years, with 46% adherence in 2023 and 39% in 2024.

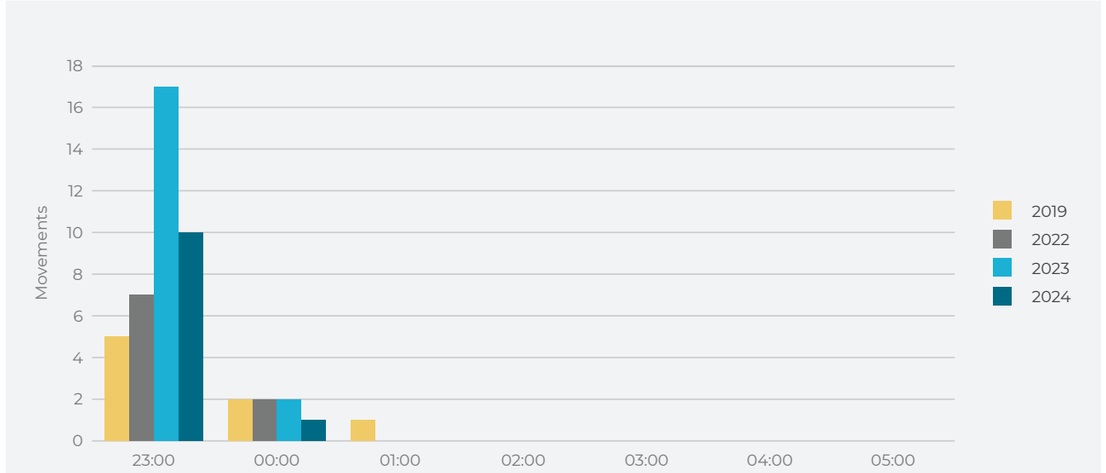
Figure 4.1: *Departures per runway and year for aircraft weighing more than 5.7 tonnes*



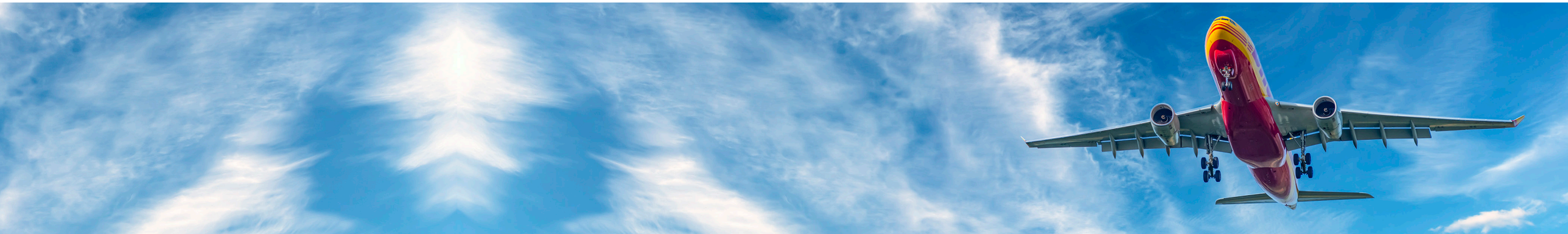
Night movements

The usual operational hours of Antwerp Airport are from 06:00 to 22:00 Local Time (AIP, AD 2.3). However, it can happen that a flight is delayed and the airport remains open until this flight takes-off or lands. To observe how the number of night movements evolved over the previous years, ***Figure 4.2*** shows the number of movements outside usual operational hours. The figures of 2024 show that 11 night movements were registered. The hour indicates the start of the hour.

Figure 4.2: *Yearly night movements per hour*



30. AD 2.20, Ch. 4.1, https://ops.skeyes.be/html/belgocontrol_static/eaip/eAIP_Main/html/eAIP/EB-AD-2.EBAW-en-GB.html



Wind Patterns

Meteorological conditions affect operations and are a frequent cause for deviating from the PRS. At Antwerp Airport, the wind typically blows in a north-easterly or south-westerly direction, with predominant winds from the south-west. This can also be seen in the wind roses in ***Figure 4.3*** The wind roses show the average wind strength in knots (colour-coded) and the direction the wind is blowing from as the angle of the petal. This way the wind of the years 2022 to 2024 and of the reference year 2019 are summarized. Comparing wind in 2024 with the year before, there were only minor differences in direction. The ones of note are that there were fewer winds from the north-east and more along the runway axis.

A monthly view on winds in 2024 is given in ***Figure 4.4*** with March, September and October having larger shares of runway 11 usage, whereas the other months were more in favour of runway 29. (see Runway Use in the ***Traffic Chapter***). In general, runway usage heavily correlates with wind patterns since the aerodynamics of the aircraft favour head wind for take-off and landings.

Figure 4.3: *Yearly wind roses*

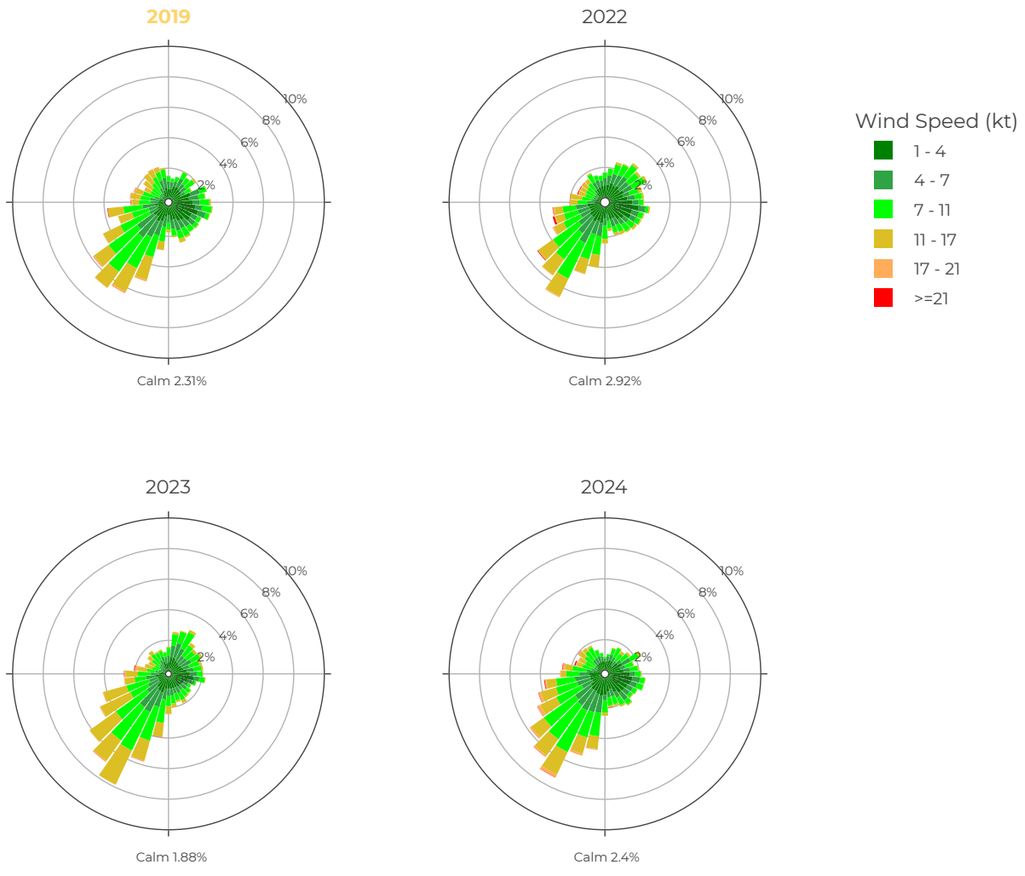
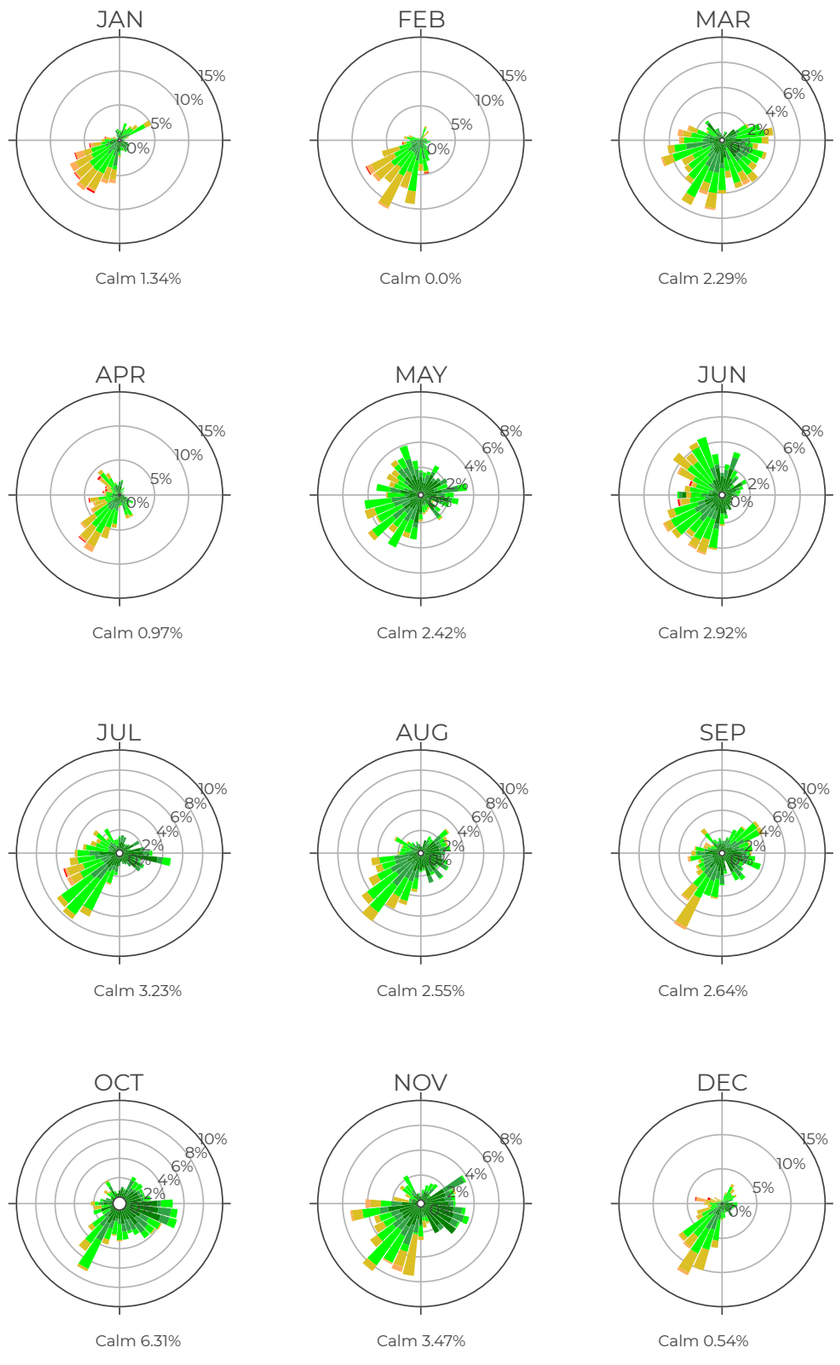


Figure 4.4: *Monthly wind roses of 2024*



Considerations and Improvements

Contributing to European environmental initiatives

As a member of FABEC, skeyes actively participates in workshops and initiatives to improve – amongst others – CDO performance. skeyes also participates in the AVENIR working group, an element in the EUROCONTROL – EASA Joint Working Program, discussing environmental improvements. An output of these discussions is the creation of the Level-off indicators.

Data-driven insights for sustainability

Another way skeyes demonstrates its commitment to sustainability is by continuously expanding and renewing its toolset for performing (environmental) assessments. For this purpose, skeyesAnalyzer (a web-based radar visualisation tool) was developed and is being implemented. This tool will – amongst others – assist various skeyes teams in visualizing, retrieving and analysing aircraft track data. The tool will also increase transparency towards the public, as it will comprise a publicly available interface.

Annex A: Missed Approaches

Table 0.1: *Missed approaches per category per runway*

	Reasons	2019	2022	2023	2024
RWY 11	aircraft with technical problems	-	1	-	-
	departing traffic on the runway	-	-	-	-
	no radio contact	-	-	1	-
	other	1	5	3	-
	pilot's error	1	1	1	-
	previous landing on the runway	2	3	1	2
	runway condition	-	1	-	-
	runway incursion	-	1	-	-
	tail wind	1	-	-	-
	taken out of sequence	1	-	-	-
	too close behind preceding	-	3	1	2
	training flight	-	1	1	-
	unstable approach	2	5	10	3
	weather - thunderstorm - windshear	-	-	-	1
	weather - visibility	5	1	-	-
	Total	**13**	**22**	**18**	**8**
RWY 29	aircraft with technical problems	1	-	1	1
	departing traffic on the runway	-	-	1	1
	no radio contact	-	-	-	-
	other	5	1	3	1
	pilot's error	1	2	2	2
	previous landing on the runway	-	1	-	2
	runway condition	-	-	-	-
	runway incursion	-	-	-	-
	tail wind	-	-	1	-
	taken out of sequence	-	-	-	1
	too close behind preceding	1	2	1	2
	training flight	-	-	-	1
	unstable approach	6	10	11	9
	weather - thunderstorm - windshear	3	1	-	1
	weather - visibility	1	2	-	2
	Total	**18**	**19**	**20**	**23**

Annex B: Fact sheets

TRAFFIC

Yearly Evolution

Movements	2019	2022	2023	2024	2024 *vs* 2023	2024 *vs* 2019
IFR	14,138	13,714	13,470	12,050	-11%	-15%
VFR	21,656	26,718	22,683	19,626	-13%	-9%
Total	35,794	40,432	36,153	31,676	-12%	-12%

Quarterly comparison

Movements	2019	2022	2023	2023	2024 *vs* 2023	2024 *vs* 2019
Q1	7,168	11,440	7,958	6,782	-15%	-5%
Q2	9,808	12,760	11,760	9,320	-21%	-5%
Q3	10,557	11,229	9,785	8,721	-11%	-17%
Q4	8,261	5,003	6,650	6,853	+3%	-17%

SAFETY

Missed Approaches

31 missed approaches in 2024 (-18% vs. 2023, same amount as 2019).

TOP 3 causes in 2024:

1. Unstable approach (12);
2. Too close behind preceding (4);
3. Previous landing on the runway (4).

Safety Occurrences

- 6 runway incursions, none with ATM contribution;
- 1 runway excursion.

CAPACITY & PUNCTUALITY

Capacity

- Capacity exceeded on 3 days for runway 11-11 only due to majority of VFR traffic;
- IFR capacity was never exceeded.

Runway configuration	*Declared IFR Capacity*	*Maximum Movements/Hour in 2024*
11-11	*41 movements/hour*	*47 movements/hour*
29-29	*41 movements/hour*	*41 movements/hour*

Punctuality

Arrival delay:

- Arrival delay: 0 min/flight;
- CRSTMP delay: 0 min/flight.

ATFM impact:

- Departures: 11,710 minutes of ATFM delay (760 due to skeyes' regulations);
- Arrivals: 13,836 minutes of ATFM delay (474 due to skeyes' regulations).

ENVIRONMENT

Runway Use

- RWY 29 – 62%;
- RWY 11 – 38%.

PRS

- 39% of movements with a MTOW of 5.7 tonnes or more used the PRS in 2024, 46% in 2023, and 40% in 2019.

Night Movements

- 11 night movements were recorded (3 more than in 2019).

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Runway Performance Report **2024**

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