Monthly Network Operations Report

Analysis – November 2018

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NOTICE

Traffic and Delay Comparisons
All traffic and delay comparisons are between report month and equivalent month of previous year, unless otherwise stated.
Graphics
All graphs in sections 2, 3 and 4 are in average minutes of ATFM delay per day, unless otherwise stated.
NM Area
All figures presented in this report are for the geographical area that is within Network Manager's responsibility (NM area). For further information on the NM Area go to the Reporting Assumptions and Descriptions document available on the EUROCONTROL website at **http://www.eurocontrol.int/articles/network-operations-monitoring-and-reporting**.

Regulation Reason Groupings
The table below shows the colour coding used in the report charts.

	EN-ROUTE CAPACITY (ATC)		AIRPORT CAPACITY (ATC)
	EN-ROUTE STAFFING (ATC)		AIRPORT STAFFING (ATC)
	EN-ROUTE DISRUPTIONS (ATC)		AIRPORT DISRUPTIONS (ATC)
	EN-ROUTE CAPACITY		AIRPORT CAPACITY
	EN-ROUTE DISRUPTIONS		AIRPORT DISRUPTIONS
	EN-ROUTE EVENTS		AIRPORT EVENTS
	EN-ROUTE WEATHER		AIRPORT WEATHER

For further information on the regulation reason groupings, go to the Reporting Assumptions and Descriptions document available on the EUROCONTROL website at **http://www.eurocontrol.int/articles/network-operations-monitoring-and-reporting**.

ATFM Statistics dashboard
More detailed information available via the new **ATFM Statistics dashboard.**

1. TOTAL TRAFFIC

Monthly traffic trend
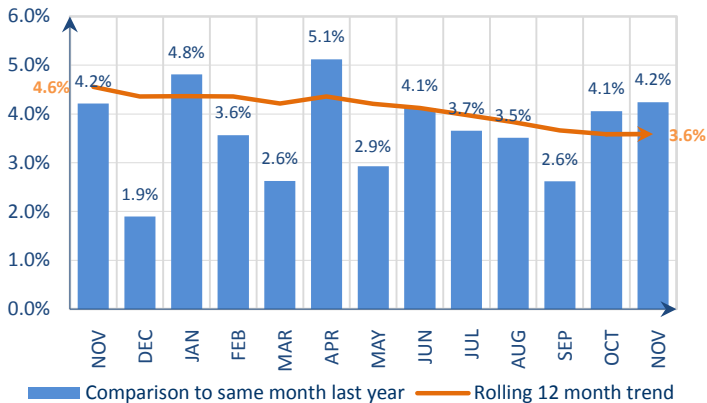
Traffic increased by 4.2% in November 2018[i].

Average daily traffic for last 5 Years
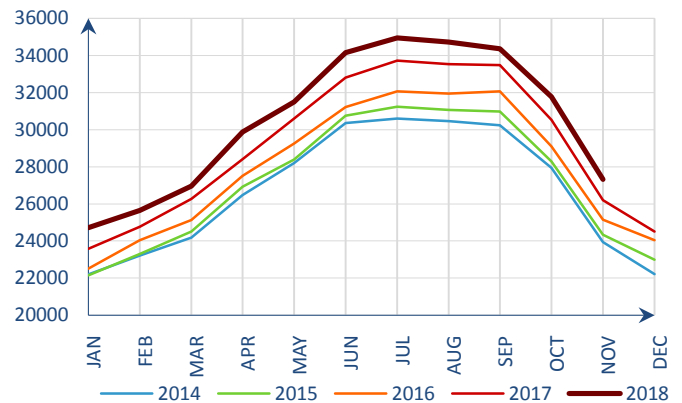
Average daily traffic in November 2018 was the highest ever recorded for November. The fall in traffic from October is due to the aircraft operator move to winter schedules.

Average daily traffic in November for last 5 Years
Forecast dated 2018-10
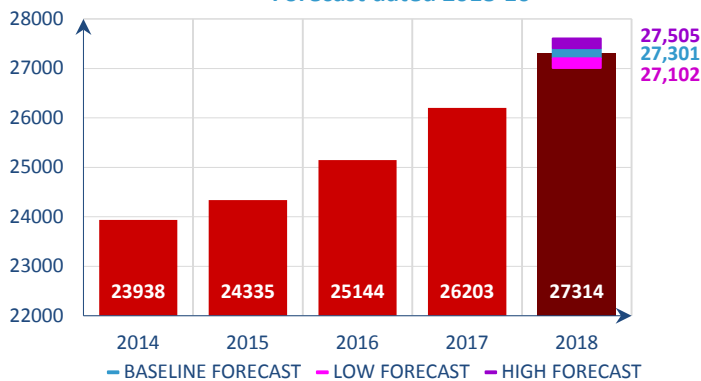
The traffic increase of 4.2% for November was in line with the baseline forecast published in October 2018.

12 months rolling traffic trend
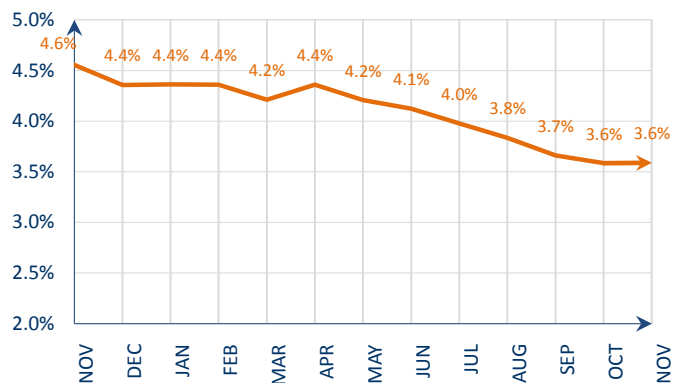
This graph shows the variation in average daily traffic for the last 12-month period relative to the previous 12-months. The average daily traffic from December 2017 to November 2018 was 3.6% higher than the average from December 2016 to November 2017.

Ten States added more than 50 flights per day to the European local[ii] traffic growth. Germany was the main contributor, adding 436 flights per day. Additional traffic was generated by its internal flow (+157 flights/day) as some airlines have now filled the gaps left following airberlin's failure at the end of October 2017. Germany also gained flights on its flows to and from Spain (+32 flights/day), Austria (+31 flights/day) and Italy (+28 flights/day). Italy and Spain were next each adding 207 flights per day each. Both States recorded additional traffic on their internal flows (+55 flights/day for Italy and +34 flights/day for Spain). Additional traffic between the two States was recorded too (28 flights/day). They also gained flights on their respective flows to and from Germany (+28 flights/day for Italy and +20 flights/day for Spain) and UK (+18 flights/day for Italy and +20 flights/day for Spain). France was next with 128 extra flights per day owing to the growth of its internal flow (+18 flights/day) and to flows to and from Germany and Morocco (+16 flights/day on each). Austria was the fifth contributor thanks to its dynamic flows to and from Germany (+31 flights/day), Spain (+16 flights/day) and Italy (+15 flights/day). The other states amongst the top 10 contributors were Greece (+78 flights/day), Poland (+66 flights/day), Ukraine (+63 flights/day), Portugal (+61 flights/day) and Morocco (+56 flights/day). For the second month in a row, UK is now again contributing positively to the network with 27 flights per day thanks to its flows to and from Spain (+19 flights/day), Italy and Portugal (+18 flights/day each). At the other end of the scale, Sweden has been losing 32 flights per day owing mainly to a decline on its internal flow (-31 flights/day).

The charter segment continued to record the fastest growth and was up 8.4%. The low-cost segment saw a 7.9% increase whereas the traditional scheduled segment grew by 3.6%. The all-cargo and business aviation segments declined by 5.8% and 3.7% respectively.

The top five external partners in average daily flights on flows in both directions were the United States (901 flights, up 6.4%), the Russian Federation (750 flights, up 10.6%), the United Arab Emirates (341 flights, up 2.4%), Egypt (285 flights, up 18.4%) and Qatar (204 flights, up 17.5%).

The airlines which added the most flights to the European network on a daily basis compared with November 2017 were Easyjet UK (+178 flights), Ryanair (+136 flights), Eurowings (+92 flights), Lufthansa (+66 flights) and Norwegian (+57 flights).

For more information on EUROCONTROL Statistics and Forecasts, go to **http://www.eurocontrol.int/statfor/sid**

Eight of the top ten airports had positive traffic growth. Overall, the largest traffic increases in November 2018 were at Berlin/Tegel, Düsseldorf, Athens, Vienna and Palma de Mallorca airports. The largest traffic decreases were at Ankara, Istanbul/Atatürk, Stockholm/Arlanda, Geneva and Köln/Bonn airports. The increase of traffic in Berlin/Tegel airport is partially due to the opening of new routes. The traffic changes in Vienna, Düsseldorf, Berlin Tegel and Palma can be partly attributed to airline failures in 2017 creating opportunity for start-up carriers and existing competitors to increase frequencies.

Nine of the top ten aircraft operators flew more compared to November 2017. The operators with the highest traffic growth were Jet2.com, Norwegian Air International, easyJet Switzerland, EuroWings and easyJet UK airlines. The highest traffic decreases were recorded by Loganair, Flybe, Royal Air Maroc, Delta Air Lines and Wizz Air.

The traffic variation of Eurowings follows the continued integration of Germanwings, some Lufthansa routes and more recently ex Air Berlin operated routes. Jet2.com traffic increase is due to an increase of fleet size. Norwegian Air International traffic variation comes from a change in fleet size following new aircraft deliveries.

N°	ADEP	ADEP NAME	201811	%
1	EDDF	FRANKFURT MAIN	687	5.3%
2	EHAM	AMSTERDAM/SCHIPHOL	656	0.8%
3	LFPG	PARIS CH DE GAULLE	643	4.0%
4	EGLL	LONDON/HEATHROW	637	-0.9%
5	LTBA	ISTANBUL-ATATURK	588	-1.8%
6	EDDM	MUENCHEN	557	5.8%
7	LEMD	ADOLFO SUAREZ MADRID-BARAJA	550	5.8%
8	LEBL	BARCELONA/EL PRAT	396	1.2%
9	LIRF	ROMA/FIUMICINO	391	8.6%
10	ENGM	OSLO/GARDERMOEN	360	2.7%
11	LOWW	WIEN SCHWECHAT	359	14.0%
12	EKCH	KOBENHAVN/KASTRUP	357	4.6%
13	LSZH	ZURICH	347	4.3%
14	ESSA	STOCKHOLM-ARLANDA	337	-1.2%
15	EGKK	LONDON/GATWICK	324	4.5%
16	EBBR	BRUSSELS NATIONAL	304	1.6%
17	EDDL	DUESSELDORF	303	22.7%
18	EIDW	DUBLIN	293	5.2%
19	LTFJ	ISTANBUL/SABIHA GOKCEN	292	5.3%
20	LFPO	PARIS ORLY	291	1.9%
21	LPPT	LISBOA	279	3.6%
22	EDDT	BERLIN-TEGEL	272	62.7%
23	EFHK	HELSINKI-VANTAA	267	6.8%
24	LIMC	MILANO MALPENSA	258	13.4%
25	EPWA	CHOPINA W WARSZAWIE	243	6.8%
26	LGAV	ATHINAI/ELEFTHERIOS VENIZELOS	242	14.2%
27	EGSS	LONDON/STANSTED	242	3.7%
28	EGCC	MANCHESTER	237	1.7%
29	LSGG	GENEVA	215	-1.0%
30	EDDH	HAMBURG	205	6.9%
31	GCLP	GRAN CANARIA	190	-0.2%
32	LLBG	TEL AVIV/BEN GURION	185	5.7%
33	LKPR	PRAHA RUZYNE	185	1.5%
34	EDDK	KOELN-BONN	179	-1.0%
35	EDDS	STUTTGART	167	11.1%
36	LEPA	PALMA DE MALLORCA	164	13.6%
37	EGPH	EDINBURGH	163	4.5%
38	LROP	BUCURESTI/HENRI COANDA	159	6.2%
39	EGGW	LONDON/LUTON	159	6.5%
40	LIML	MILANO LINATE	153	1.8%
41	LFLL	LYON SAINT-EXUPERY	153	7.2%
42	LEMG	MALAGA/COSTA DEL SOL	151	8.6%
43	LFMN	NICE-COTE D'AZUR	148	2.6%
44	LHBP	BUDAPEST LISZT FERENC INT.	148	9.7%
45	LTAC	ANKARA-ESENBOGA	138	-16.9%
46	LTAI	ANTALYA	138	0.0%
47	EGBB	BIRMINGHAM	132	2.2%
48	UKBB	KYIV/BORYSPIL	132	0.0%
49	LFBO	TOULOUSE BLAGNAC	132	-0.3%
50	EDDB	SCHOENEFELD-BERLIN	130	-0.6%
		TOTALS and % TOTAL TRAFFIC	**14238**	**58.8%**

Top 50 Departure Airports with average daily traffic and percentage compared to same period of previous year

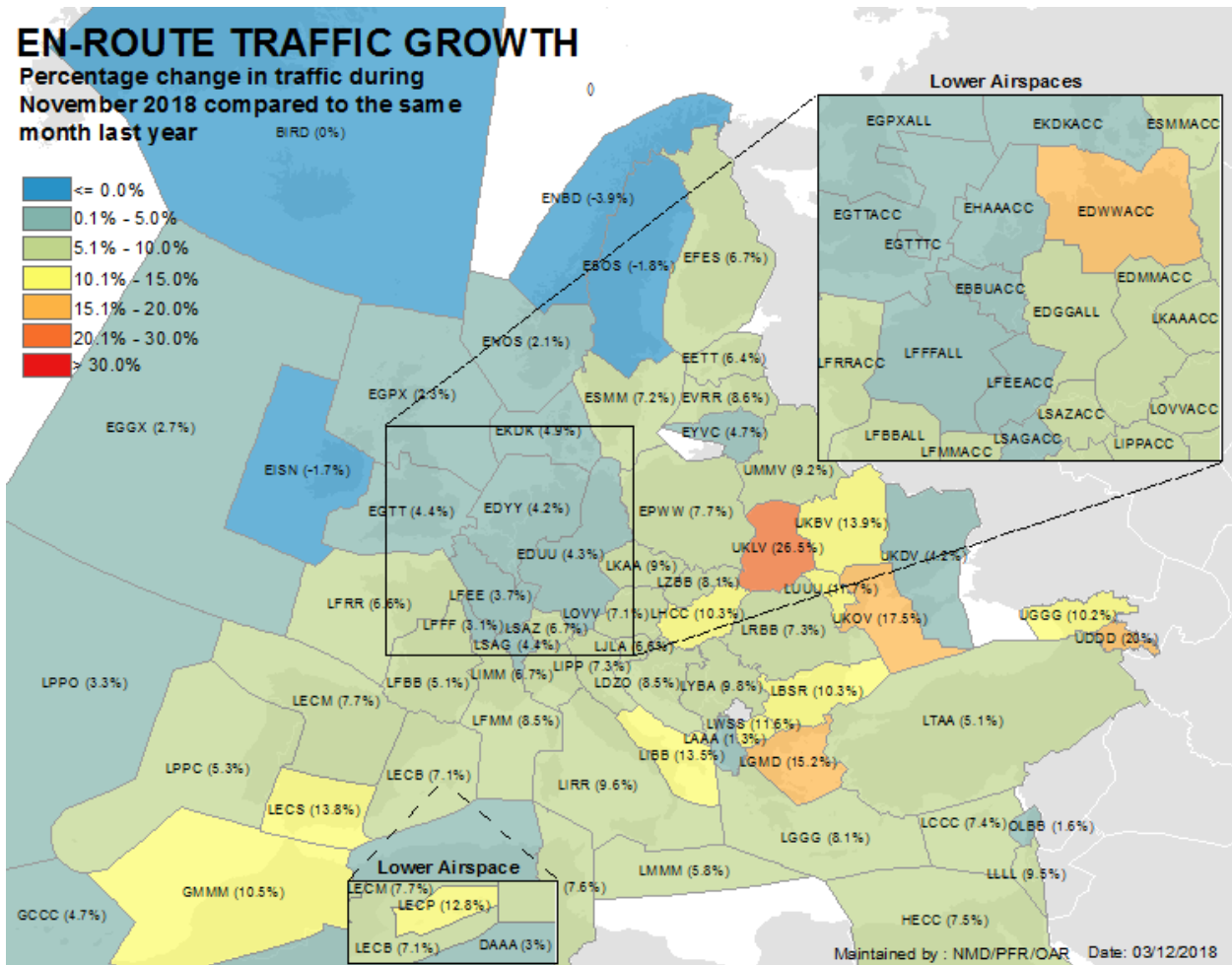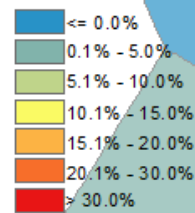| N°	ICAO	AIR OPERATOR	201811	%
1	RYR	RYANAIR	1860	8.0%
2	DLH	DEUTSCHE LUFTHANSA	1479	4.7%
3	THY	TURKISH AIRLINES	1235	2.2%
4	EZY	EASYJET	1223	17.0%
5	AFR	AIR FRANCE	865	0.9%
6	SAS	SCANDINAVIAN AIRLINES SYSTEM	861	0.9%
7	KLM	KLM ROYAL DUTCH AIRL	655	3.2%
8	BAW	BRITISH AIRWAYS	647	-0.6%
9	EWG	EUROWINGS AG	616	17.5%
10	AZA	ALITALIA	514	6.9%
11	VLG	VUELING AIRLINES SA	495	7.9%
12	PGT	PEGASUS HAVA TASI.	433	1.7%
13	WZZ	WIZZ AIR	420	-1.0%
14	SWR	SWISS INTERNATIONAL	377	4.9%
15	BEE	JERSEY EUROPEAN T/A FLYBE	373	-9.3%
16	AUA	AUSTRIAN AIRLINES	361	4.7%
17	NAX	NORWEGIAN AIR SHUTTLE	357	7.5%
18	TAP	TAP/AIR PORTUGAL	350	2.9%
19	LOT	LOT-POLISH AIRLINES	347	13.9%
20	FIN	FINNAIR O/Y	341	4.8%
21	WIF	WIDEROE	335	0.5%
22	AFL	AEROFLOT-RUSSIAN	329	14.1%
23	IBK	NORWEGIAN AIR INTERNATIONAL	280	25.8%
24	AEA	AIR EUROPA	261	12.9%
25	IBE	IBERIA	258	7.6%
26	QTR	QATAR AIRWAYS COMP.	245	15.8%
27	HOP	HOP (MERGE OF BZH + RAE + RLA)	217	0.1%
28	BEL	BRUSSELS AIRLINES	210	2.4%
29	UAE	EMIRATES	200	6.0%
30	ANE	AIR NOSTRUM	199	1.5%
31	EIN	AER LINGUS TEORANTA	197	12.6%
32	BCS	EUROPEAN AIR TRANSP.	190	10.2%
33	RAM	ROYAL AIR MAROC	182	-1.4%
34	AUI	UKRAINE INTERNATIONA	155	6.6%
35	BTI	AIR BALTIC CORPORAT.	143	12.0%
36	OAL	OLYMPIC	132	10.7%
37	EZS	EASY JET SWITZERLAND	127	18.4%
38	EXS	JET2.COM	117	28.3%
39	NJE	NETJETS	116	3.3%
40	AEE	AEGEAN AIRLINES	115	0.9%
41	CFE	CITYFLYER EXPRESS	114	6.1%
42	IBB	BINTER CANARIAS	111	9.8%
43	UAL	UNITED AIRLINES INC.	109	1.7%
44	ROT	TAROM	108	11.5%
45	LOG	LOGANAIR	107	-14.1%
46	TRA	TRANSAVIA.COM	101	4.9%
47	DAH	AIR ALGERIE	99	1.8%
48	SXS	SUNEXPRESS AIRLINES	99	3.2%
49	IBS	IBERIA EXPRESS	98	9.9%
50	DAL	DELTA AIR LINES INC.	96	-1.1%
		TOTALS and % TOTAL TRAFFIC	**18859**	**69.0%**

Top 50 Air Operators with average daily traffic and percentage compared to same period of previous year

N°	ICAO	AIR OPERATOR	201811	%
		Unidentified	1859	-1.3%

Average daily traffic and percentage compared to same period of previous year for all flights where Air Operators can't be identified

EN-ROUTE TRAFFIC GROWTH

Percentage change in traffic during November 2018 compared to the same month last year

Legend:
- <= 0.0%
- 0.1% - 5.0%
- 5.1% - 10.0%
- 10.1% - 15.0%
- 15.1% - 20.0%
- 20.1% - 30.0%
- > 30.0%

Map labels:

BIRD (0%), ENBD (-3.9%), EFES (6.7%), EBOS (-1.8%), ENOS (2.1%), EGPX (2.3%), ESMM (7.2%), EVRR (8.6%), EETT (6.4%), EGGX (2.7%), EISN (-1.7%), EYVC (4.7%), EKDK (4.9%), UMMV (9.2%), EGTT (4.4%), EDYY (4.2%), EPWW (7.7%), UKBV (13.9%), EDUU (4.3%), LKAA (9%), UKLV (26.5%), UKDV (4.2%), LZBB (8.1%), LUUU (11.7%), LFRR (6.6%), LFEE (3.7%), LOVV (7.1%), LHCC (10.3%), UKOV (17.5%), UGGG (10.2%), LPFF (3.1%), LSAZ (6.7%), LRBB (7.3%), UDDD (20%), LSAG (4.4%), LJLA (6.6%), LPPO (3.3%), LFBB (5.1%), LIMM (6.7%), LIPP (7.3%), LDZO (8.5%), LYBA (9.8%), LBSR (10.3%), LTAA (5.1%), LECM (7.7%), LFMM (8.5%), LWSS (11.6%), LAAA (1.3%), LIBB (13.5%), LGMD (15.2%), LPPC (5.3%), LECB (7.1%), LIRR (9.6%), LCCC (7.4%), OLBB (1.6%), LECS (13.8%), LGGG (8.1%), LLLL (9.5%), LMMM (5.8%), GMMM (10.5%), HECC (7.5%), GCCC (4.7%)

Lower Airspace: LECM (7.7%), LECP (12.8%), LECB (7.1%), DAAA (3%), (7.6%)

Lower Airspaces (inset): EGPXALL, EKDKACC, ESMMACC, EGTTACC, EHAAACC, EDWWACC, EGTTTC, EBBUACC, EDMMACC, EDGGALL, LKAAACC, LFRRACC, LFFFALL, LFEEACC, LSAZACC, LOVVACC, LFBBALL, LSAGACC, LIPPACC, LFMMACC

Maintained by : NMD/PFR/OAR   Date: 03/12/2018

Nº	ASP ID	ASP NAME	201811	%		Nº	ASP ID	ASP NAME	201811	%
1	BIRDACC	REYKJAVIK ACC	342	0.0%		39	LFBBALL	BORDEAUX ALL ACC	2224	5.2%
2	DAAAACC	ALGERS ACC	474	3.0%		40	LFEEACC	REIMS U/ACC	2435	3.7%
3	DTTCACC	TUNIS ACC	270	7.6%		41	LFFFALL	PARIS ALL ACC	3002	3.1%
4	EBBUACC	BRUSSELS CANAC	1592	0.9%		42	LFMMACC	MARSEILLE ACC	2593	8.5%
5	EDGGALL	LANGEN ACC_FIR	3558	9.0%		43	LFMMAPP	MARSEILLE TMA	723	3.1%
6	EDMMACC	MUNCHEN ACC	3066	8.1%		44	LFRRACC	BREST U/ACC	2488	6.6%
7	EDUUUAC	KARLSRUHE UAC	4693	4.3%		45	LGGGACC	ATHINAI CONTROL	1067	8.1%
8	EDWWACC	BREMEN ACC	1815	18.2%		46	LGMDACC	MAKEDONIA CONTROL	888	15.2%
9	EDYYUAC	MAASTRICHT UAC	4773	4.2%		47	LHCCACC	BUDAPEST ACC	1958	10.3%
10	EETTACC	TALLIN ACC	552	6.4%		48	LIBBACC	BRINDISI ACC	688	13.5%
11	EFESACC	TAMPERE ACC	559	6.7%		49	LIMMACC	MILANO ACC	2037	6.7%
12	EGGXOCA	SHANWICK OACC	1209	2.7%		50	LIPPACC	PADOVA ACC	1547	7.3%
13	EGPXALL	SCOTTISH ACC	2546	2.3%		51	LIRRACC	ROMA ACC	1973	9.6%
14	EGTTACC	LONDON ACC	5023	4.4%		52	LJLAACC	LJUBLJANA ACC	659	6.6%
15	EGTTTC	LONDON TMA TC	3559	2.1%		53	LKAAACC	PRAGUE ACC	2023	9.0%
16	EHAAACC	AMSTERDAM ACC(245-)	1538	1.6%		54	LLLLACC	TEL AVIV ACC	494	9.5%
17	EIDWACC	DUBLIN ACC	623	3.7%		55	LMMMACC	MALTA ACC	293	5.8%
18	EISNACC	SHANNON ACC	1073	-1.7%		56	LOVVACC	WIEN ACC	2055	7.1%
19	EKDKACC	COPENHAGEN ACC	1512	4.9%		57	LPPCACC	LISBOA ACC/UAC	1542	5.3%
20	ENBDACC	BODO ACC	595	-3.9%		58	LPPOOAC	SANTA MARIA OACC	379	3.3%
21	ENOSACC	OSLO ATCC	994	2.1%		59	LQSBACC	BOSNIA-HERZEGOVINA	86	-7.5%
22	ENSVACC	STAVANGER ATCC	626	3.1%		60	LRBBACC	BUCURESTI ACC	1709	7.3%
23	EPWWACC	WARSZAWA ACC	1996	7.7%		61	LSAGACC	GENEVA ACC	1551	4.4%
24	ESMMACC	MALMO ACC	1527	7.2%		62	LSAZACC	ZURICH ACC	1945	6.7%
25	ESOSACC	STOCKHOLM ACC	1168	-1.9%		63	LTAAACC	ANKARA ACC	3461	5.1%
26	EVRRACC	RIGA ACC	722	8.6%		64	LTBBACC	ISTANBUL ACC	1662	-11.5%
27	EYVCACC	VILNIUS ACC	623	4.7%		65	LUUUACC	CHISINAU ACC	115	11.7%
28	GCCCACC	CANARIAS ACC/FIC	1053	4.7%		66	LWSSACC	SKOPJE ACC	307	11.6%
29	GMMMACC	CASABLANCA ACC	1279	10.5%		67	LYBAACC	BEOGRADE ACC	1407	9.8%
30	HECCACC	CAIROACC	661	7.5%		68	LZBBACC	BRATISLAVA ACC	1210	8.1%
31	LAAAACC	TIRANA ACC	384	1.3%		69	OLBBACC	BEIRUT ACC	130	1.6%
32	LBSRACC	SOFIA ACC	1921	10.3%		70	UDDDACC	YEREVAN ACC	168	20.0%
33	LCCCACC	NICOSIA ACC	966	7.5%		71	UGGGACC	TBILISI ACC	410	10.2%
34	LDZOACC	ZAGREB ACC	1136	8.5%		72	UKBVACC	KIEV ACC	411	13.9%
35	LECBACC	BARCELONA ACC	1864	7.1%		73	UKDVACC	DNIPROPETROVSK ACC	50	4.2%
36	LECMALL	MADRID ALL ACC	2987	7.7%		74	UKLVACC	L'VIV ACC	334	26.5%
37	LECPACC	PALMA ACC	433	12.8%		75	UKOVACC	ODESSA ACC	242	17.5%
38	LECSACC	SEVILLA ACC	1078	13.8%		76	UMMVACC	MINSK ACC	739	9.2%

The Casablanca, Sevilla, Canaries, Lisbon and Madrid ACCs variation is due to increased traffic on the South/West axis. High growth figures in Bremen and Palma are most probably explained by the cessation of both Monarch and Air Berlin operations at the beginning of November 2017 suppressing traffic levels which have since recovered.

The highest relative traffic increases in November 2018 were in L'viv, Yerevan, Odessa and Makedonia ACCs. Traffic increase in Ukraine is partially due to an increase in overflights. The traffic decrease in Istanbul airspace is due to Turkish ACC re-structuring.
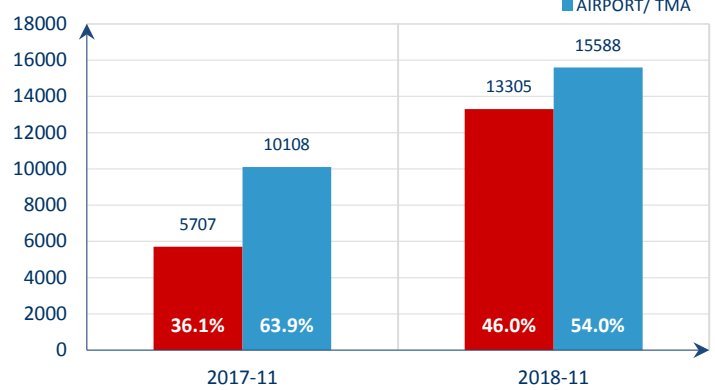
2. ATFM DELAY AND ATTRIBUTIONS
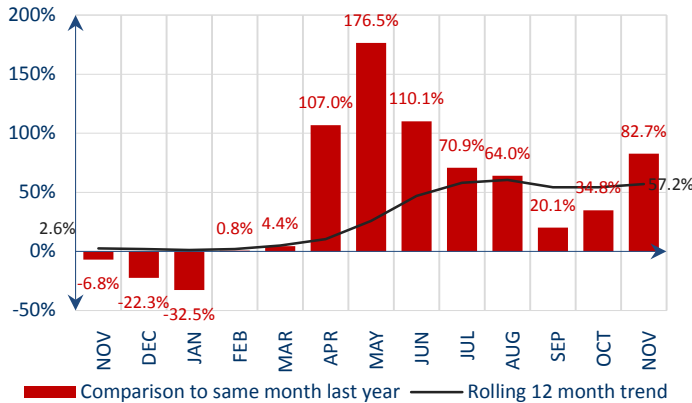
Average daily ATFM delays
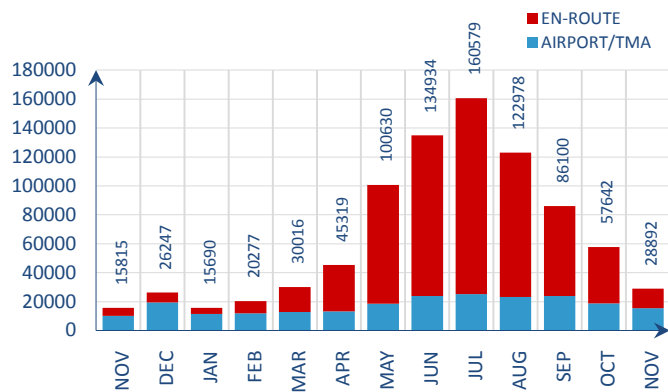
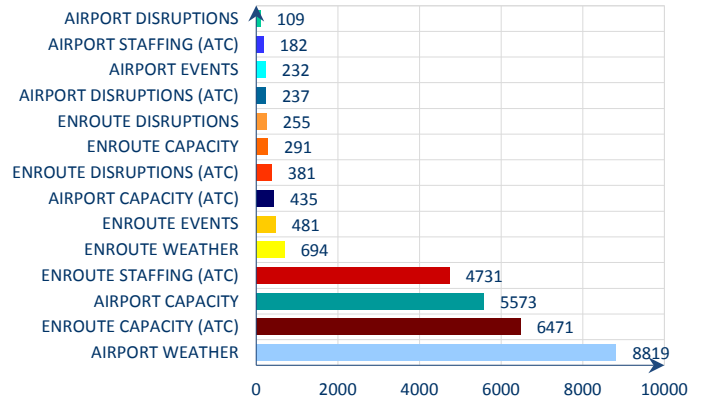Total ATFM delays increased by 82.7% in November 2018[i].

Average daily ATFM delays

EN-ROUTE
AIRPORT/ TMA

En-route ATFM delays increased by 133.1% and airport ATFM delays increased by 54.2%.

Monthly ATFM delays trend

Comparison to same month last year ▬ Rolling 12 month trend

The rolling 12-month trend shows that ATFM delay was 57.2% higher during the period December 2017 – November 2018 compared to December 2016 – November 2017.

Reasons for ATFM delays in November 2018

Reason	Value
AIRPORT DISRUPTIONS	109
AIRPORT STAFFING (ATC)	182
AIRPORT EVENTS	232
AIRPORT DISRUPTIONS (ATC)	237
ENROUTE DISRUPTIONS	255
ENROUTE CAPACITY	291
ENROUTE DISRUPTIONS (ATC)	381
AIRPORT CAPACITY (ATC)	435
ENROUTE EVENTS	481
ENROUTE WEATHER	694
ENROUTE STAFFING (ATC)	4731
AIRPORT CAPACITY	5573
ENROUTE CAPACITY (ATC)	6471
AIRPORT WEATHER	8819

Airport weather (30.5%), en-route ATC capacity (22.4%), airport capacity (19.3%) and en-route ATC staffing (16.4%) were the main causes of ATFM delays in November 2018.

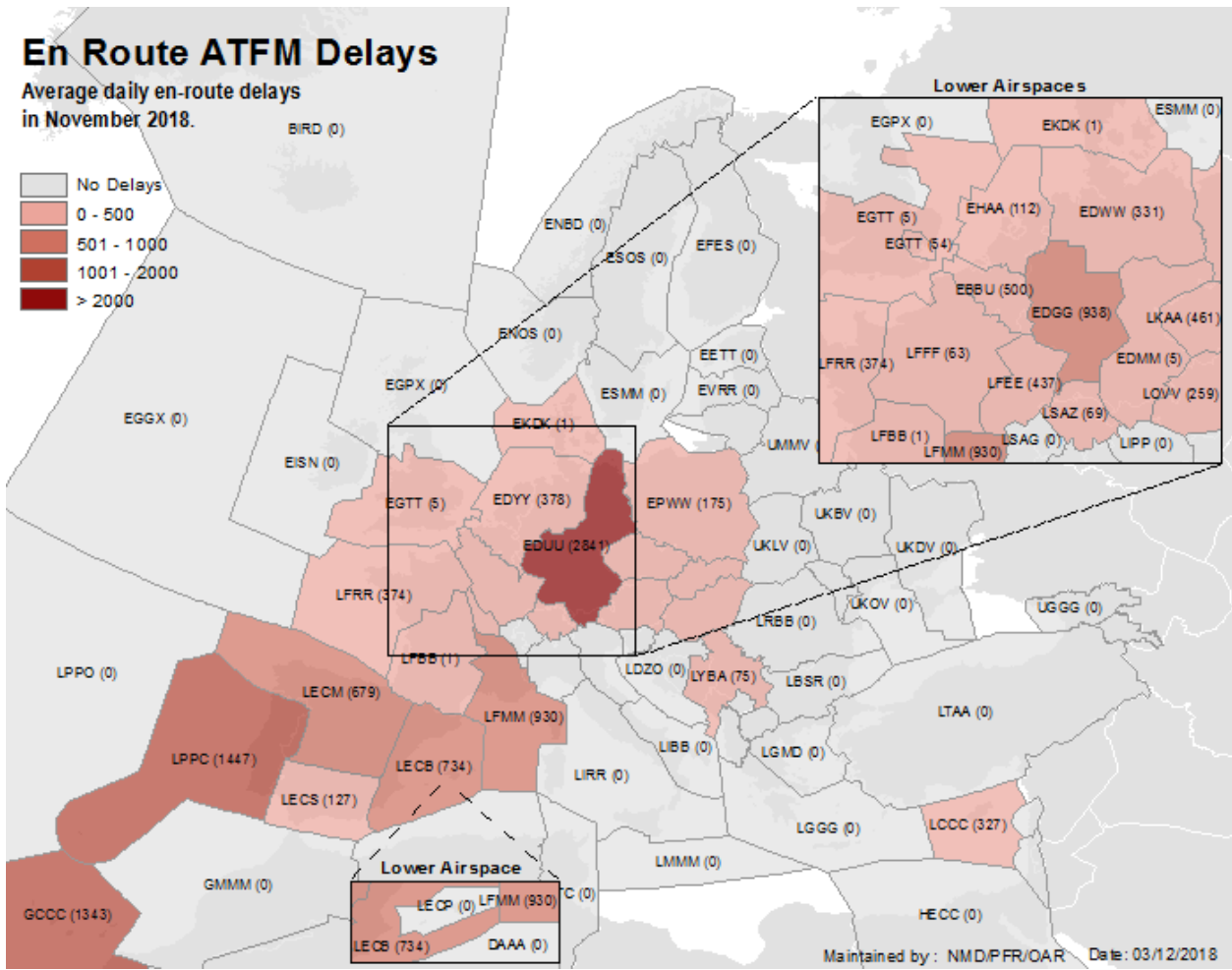## Top 20 delay reference locations in November 2018
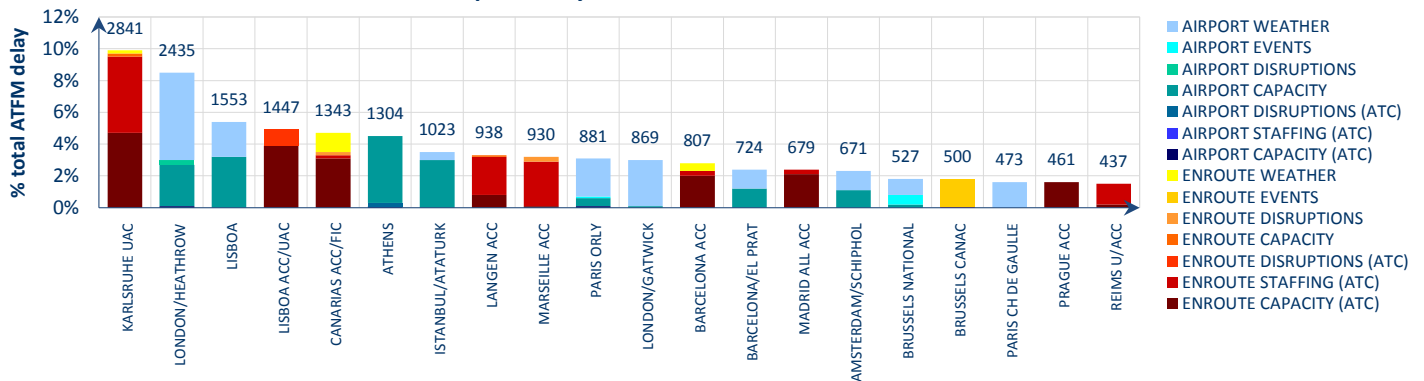
These are the top 20 delay generating locations for the reporting month with respect to total ATFM delays. Figures are the average daily delays in minutes for the individual locations.

- Seasonal weather impacted operations strongly at London airports, and to a lesser extent at Lisbon, Paris/Orly, Paris/Charles de Gaulle, Barcelona and Amsterdam/Schiphol airports;
- En-route capacity delays in Karlsruhe, Lisbon, Canarias, Madrid, Barcelona and Prague ACCs;
- Airport capacity in conjunction with maintenance generated high delays at Athens airport;
- Military activity to the north of the airfield of Lisbon airport generated capacity delays;
- En-route staffing delays in Karlsruhe, Langen, Marseille and Reims ACCs;
- Radar maintenance in Lisbon ACC generated ATC disruption delays throughout the month.

3. EN-ROUTE ATFM DELAYS

EN-ROUTE ATFM DELAY PER LOCATION

Top 20 delay locations for en-route delays in November 2018
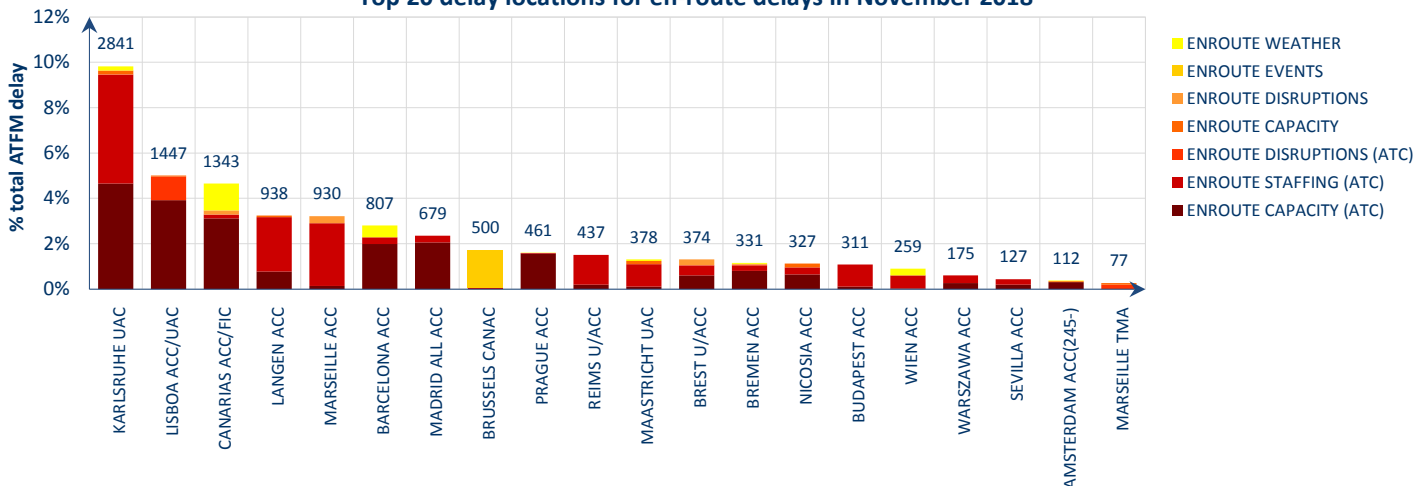
These are the top 20 en-route ATFM delay generating locations for the reporting month with respect to total ATFM delays. Figures are the average daily delays in minutes for the individual locations.

The top 20 en-route ATFM delay locations generated **44.5%** of the monthly total (network) ATFM delay.
The top 5 en-route ATFM delay locations generated **26.0%** of the monthly total (network) ATFM delay.

More detailed information available in the Airspace dashboard via the **ATFM Statistics dashboard.**

EN-ROUTE ATFM DELAY PER DELAY GROUP

Reasons for en-route delays in November 2018

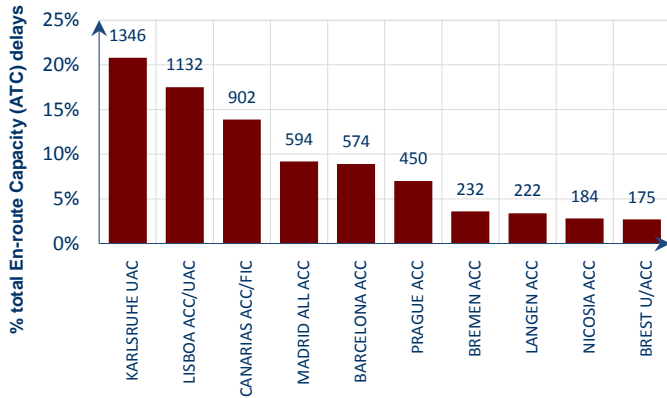| Reason	%
ENROUTE DISRUPTIONS	0.9%
ENROUTE CAPACITY	1.0%
ENROUTE DISRUPTIONS (ATC)	1.3%
ENROUTE EVENTS	1.7%
ENROUTE WEATHER	2.4%
ENROUTE STAFFING (ATC)	16.4%
ENROUTE CAPACITY (ATC)	22.4%
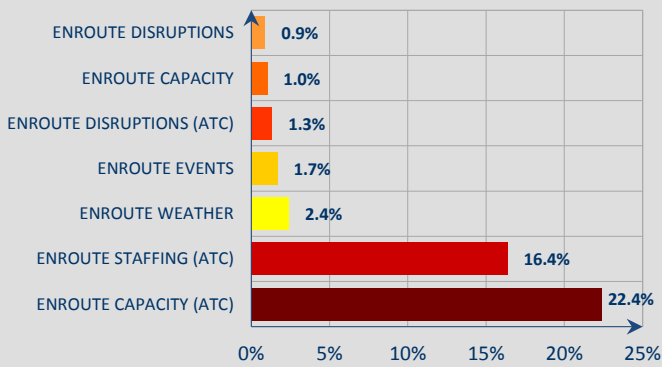
En-route ATFM delays accounted for 46.0% of all ATFM delays. Most of this delay was caused by en-route ATC capacity, en-route ATC staffing and en-route weather as explained in detail below. The other causes were:

En-route events; Ongoing planned system upgrade to the CANAC2 ATM system in Brussels ACC generated 14,443 minutes of ATFM delay;

En-route ATC disruptions; Radar maintenance in Lisbon ACC generated 9,058 minutes of ATFM delay;
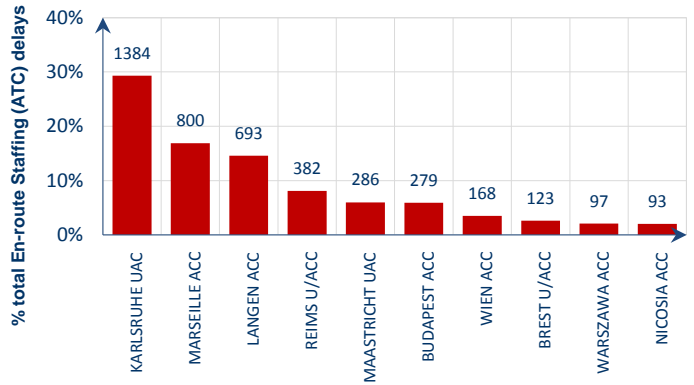
En-route capacity; Military activities in Beograd, Nicosia, Karlsruhe and Maastricht ACCs.

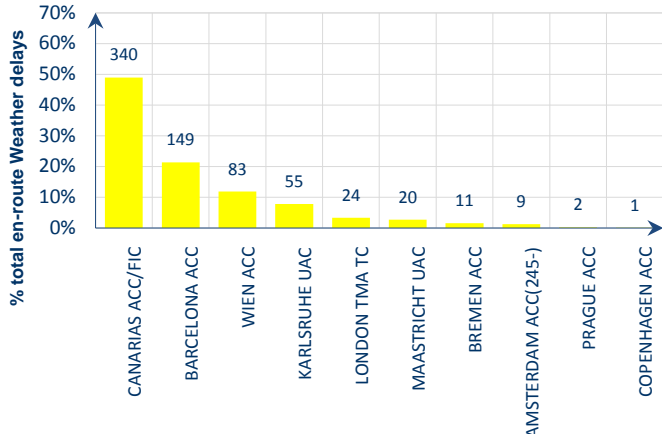### Top en-route Capacity (ATC) delays in November 2018

ACC	Value
KARLSRUHE UAC	1346
LISBOA ACC/UAC	1132
CANARIAS ACC/FIC	902
MADRID ALL ACC	594
BARCELONA ACC	574
PRAGUE ACC	450
BREMEN ACC	232
LANGEN ACC	222
NICOSIA ACC	184
BREST U/ACC	175

Karlsruhe and Lisbon ACCs generated 38.3% of these delays throughout the month.

Top en-route Staffing (ATC) delays in November 2018

ACC	Value
KARLSRUHE UAC	1384
MARSEILLE ACC	800
LANGEN ACC	693
REIMS U/ACC	382
MAASTRICHT UAC	286
BUDAPEST ACC	279
WIEN ACC	168
BREST U/ACC	123
WARSZAWA ACC	97
NICOSIA ACC	93

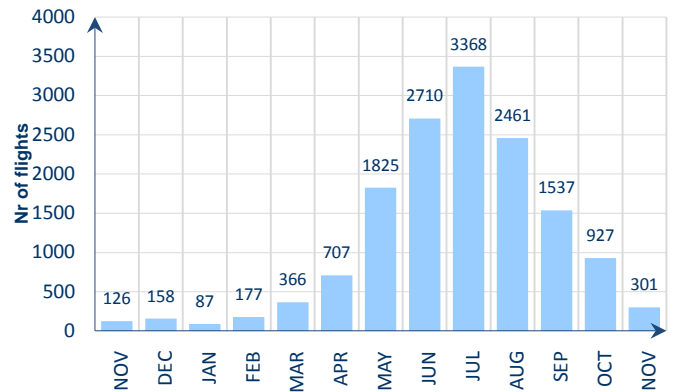Karlsruhe UAC was the biggest generator of ATC staffing delays with a total of 41,531 minutes.

Top en-route Weather delays in November 2018

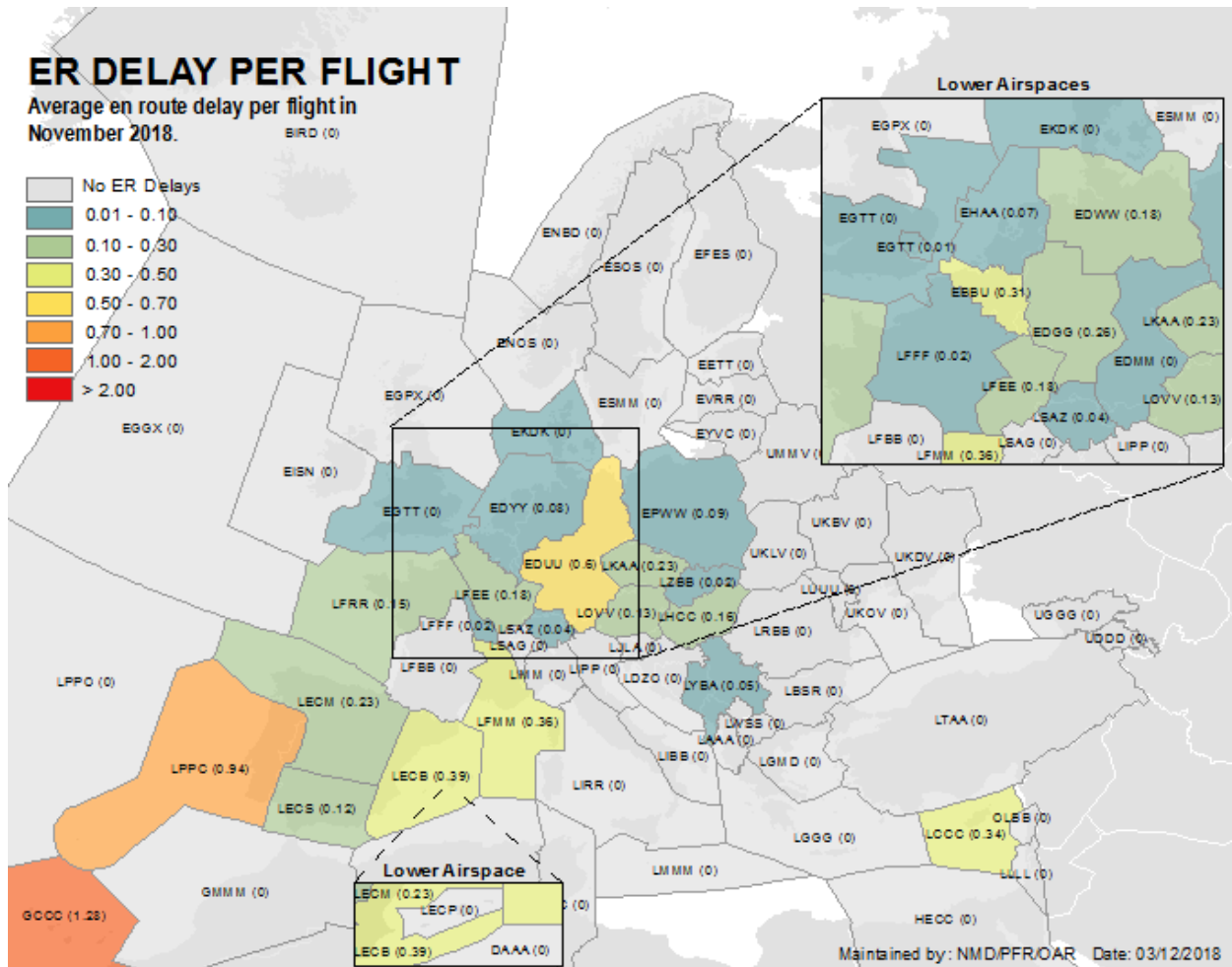| ACC	Value
CANARIAS ACC/FIC	340
BARCELONA ACC	149
WIEN ACC	83
KARLSRUHE UAC	55
LONDON TMA TC	24
MAASTRICHT UAC	20
BREMEN ACC	11
AMSTERDAM ACC(245-)	9
PRAGUE ACC	2
COPENHAGEN ACC	1

Strong winds impacted operations in Canarias ACC with a peak of 7,236 minutes of delay on 17 November.

Average daily flights >= 15 min en-route delay

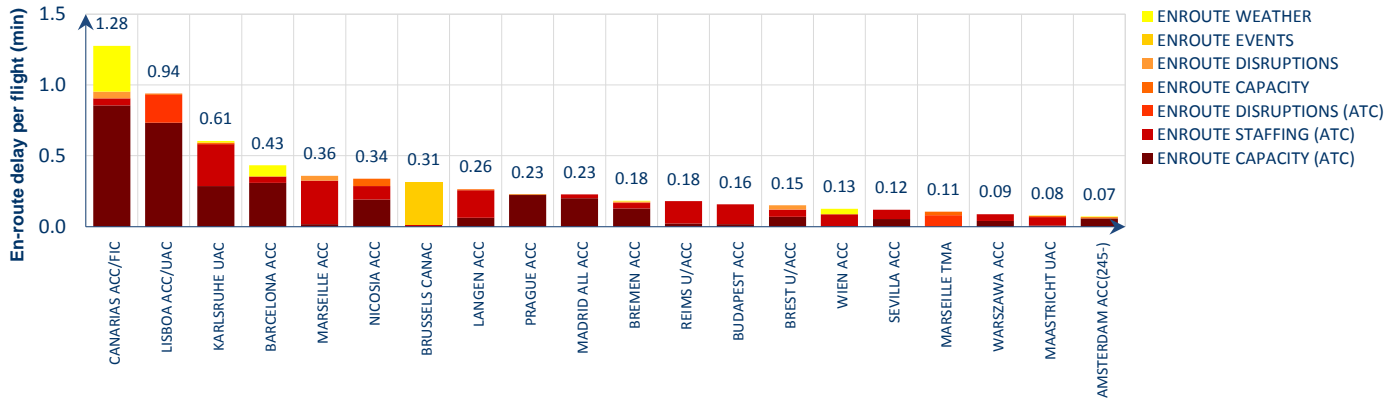| Month	Nr of flights
NOV	126
DEC	158
JAN	87
FEB	177
MAR	366
APR	707
MAY	1825
JUN	2710
JUL	3368
AUG	2461
SEP	1537
OCT	927
NOV	301

The average daily flights with an en-route ATFM delay of at least 15 minutes increased from 126 flights/day in November 2017 to 301 flights/day in November 2018, which represents 1.1% of all traffic.

EN-ROUTE ATFM DELAY PER FLIGHT

ER DELAY PER FLIGHT
Average en route delay per flight in November 2018.

Legend:
- No ER Delays
- 0.01 - 0.10
- 0.10 - 0.30
- 0.30 - 0.50
- 0.50 - 0.70
- 0.70 - 1.00
- 1.00 - 2.00
- > 2.00

Top 20 delay locations for en-route delays in November 2018

Legend:
- ENROUTE WEATHER
- ENROUTE EVENTS
- ENROUTE DISRUPTIONS
- ENROUTE CAPACITY
- ENROUTE DISRUPTIONS (ATC)
- ENROUTE STAFFING (ATC)
- ENROUTE CAPACITY (ATC)

These are the top 20 average en-route ATFM delay per flight generating locations for the reporting month. Figures are the average en-route ATFM delay per flight in minutes for the individual locations.
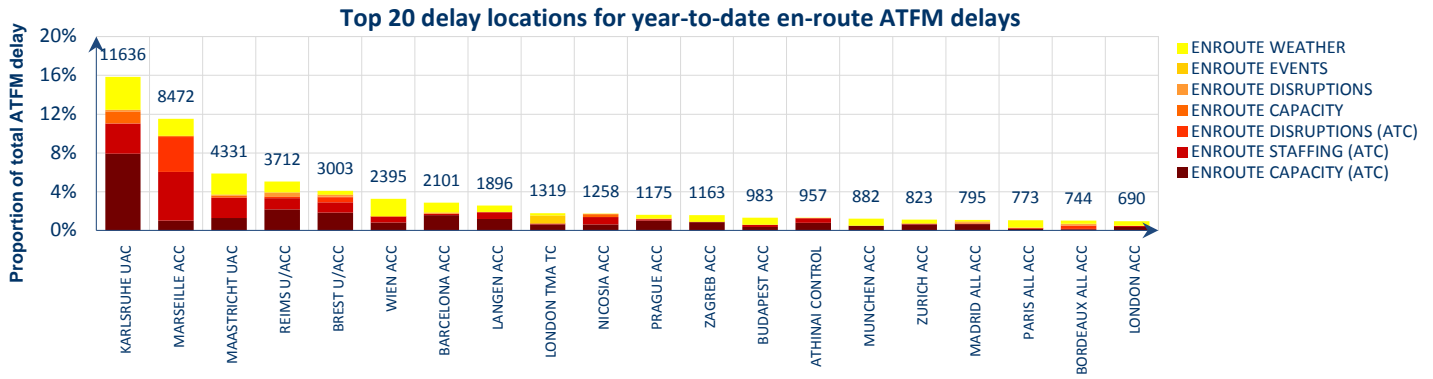
Most of the ACCs en-route ATFM delay/flight decreased compared to October due to fewer flights during the winter schedule.

Except for the South/West axis where the traffic is going up due to end of the year period.

Canarias ACC en-route ATFM delay/flight increased from 0.64 min/flight in October 2018 to 1.28 min/flight in November 2018, mainly due to more ATC capacity issues;

Lisbon ACC en-route ATFM delay/flight increased from 0.51 min/flight in October 2018 to 0.94 min/flight in November 2018, mainly due to more ATC capacity issues.
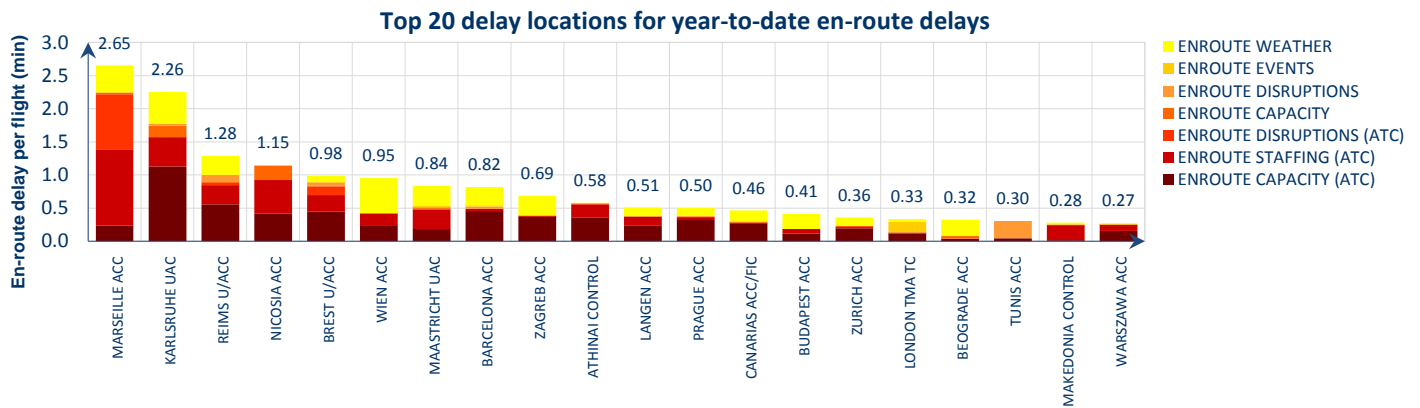
EN-ROUTE ATFM DELAY YEAR-TO-DATE

Top 20 delay locations for year-to-date en-route ATFM delays

Legend:
- ENROUTE WEATHER
- ENROUTE EVENTS
- ENROUTE DISRUPTIONS
- ENROUTE CAPACITY
- ENROUTE DISRUPTIONS (ATC)
- ENROUTE STAFFING (ATC)
- ENROUTE CAPACITY (ATC)

Values (left to right): KARLSRUHE UAC 11636, MARSEILLE ACC 8472, MAASTRICHT UAC 4331, REIMS U/ACC 3712, BREST U/ACC 3003, WIEN ACC 2395, BARCELONA ACC 2101, LANGEN ACC 1896, LONDON TMA TC 1319, NICOSIA ACC 1258, PRAGUE ACC 1175, ZAGREB ACC 1163, BUDAPEST ACC 983, ATHINAI CONTROL 957, MUNCHEN ACC 882, ZURICH ACC 823, MADRID ALL ACC 795, PARIS ALL ACC 773, BORDEAUX ALL ACC 744, LONDON ACC 690

These are the top 20 en-route delay locations for 2018 with respect to the total ATFM delay. Figures are the average daily en-route delay in minutes for the individual locations.
The top 20 en-route delay locations generated **66.8%** of the total ATFM (network) delay.
The top 5 en-route delay locations generated **42.4%** of the total ATFM (network) delay.

Top 20 delay locations for year-to-date en-route delays

Legend:
- ENROUTE WEATHER
- ENROUTE EVENTS
- ENROUTE DISRUPTIONS
- ENROUTE CAPACITY
- ENROUTE DISRUPTIONS (ATC)
- ENROUTE STAFFING (ATC)
- ENROUTE CAPACITY (ATC)

Values (left to right): MARSEILLE ACC 2.65, KARLSRUHE UAC 2.26, REIMS U/ACC 1.28, NICOSIA ACC 1.15, BREST U/ACC 0.98, WIEN ACC 0.95, MAASTRICHT UAC 0.84, BARCELONA ACC 0.82, ZAGREB ACC 0.69, ATHINAI CONTROL 0.58, LANGEN ACC 0.51, PRAGUE ACC 0.50, CANARIAS ACC/FIC 0.46, BUDAPEST ACC 0.41, ZURICH ACC 0.36, LONDON TMA TC 0.33, BEOGRADE ACC 0.32, TUNIS ACC 0.30, MAKEDONIA CONTROL 0.28, WARSZAWA ACC 0.27
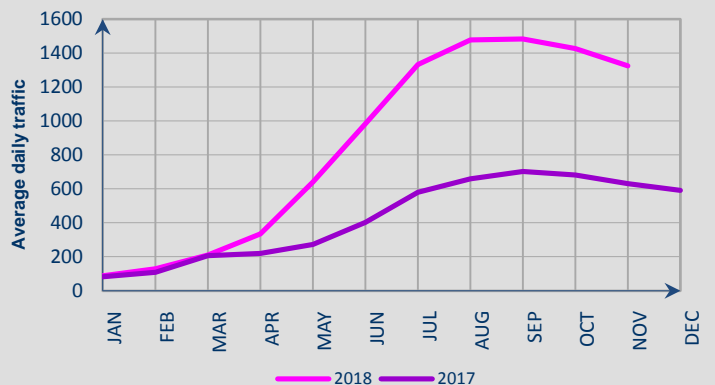
These are the top 20 average en-route ATFM delay per flight generating locations in 2018. Figures are the average daily en-route delay in minutes for the individual locations.

Monthly en-route delay per flight monitoring

Legend:
- MONTHLY GUIDELINE DLY/FLT
- YTD GUIDELINE DLY/FLT
- MONTHLY ENROUTE DLY/FLT
- YTD ENROUTE DLY/FLT
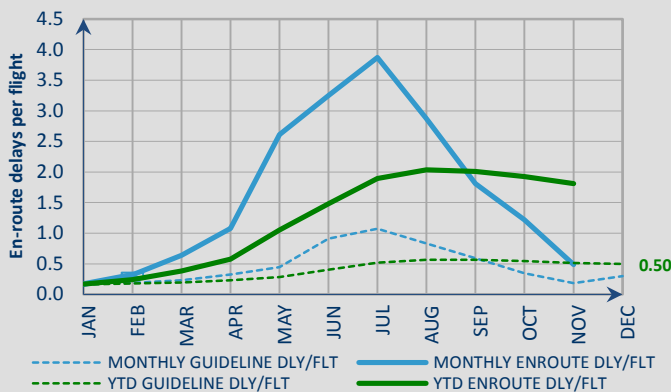
Year-to-date daily flights >= 15 min en-route delay

Legend:
- 2018
- 2017

Reporting month: The average en-route ATFM delay per flight in the NM area[iii] in November was 0.49 min/flt, which is above the corresponding monthly guideline[iv] value of 0.18 min/flt.
Year To Date: The average YTD en-route ATFM delay per flight in 2018 in the NM area[iii] is 1.81 min/flt which is more than three times the corresponding guideline value of 0.52 min/flt.
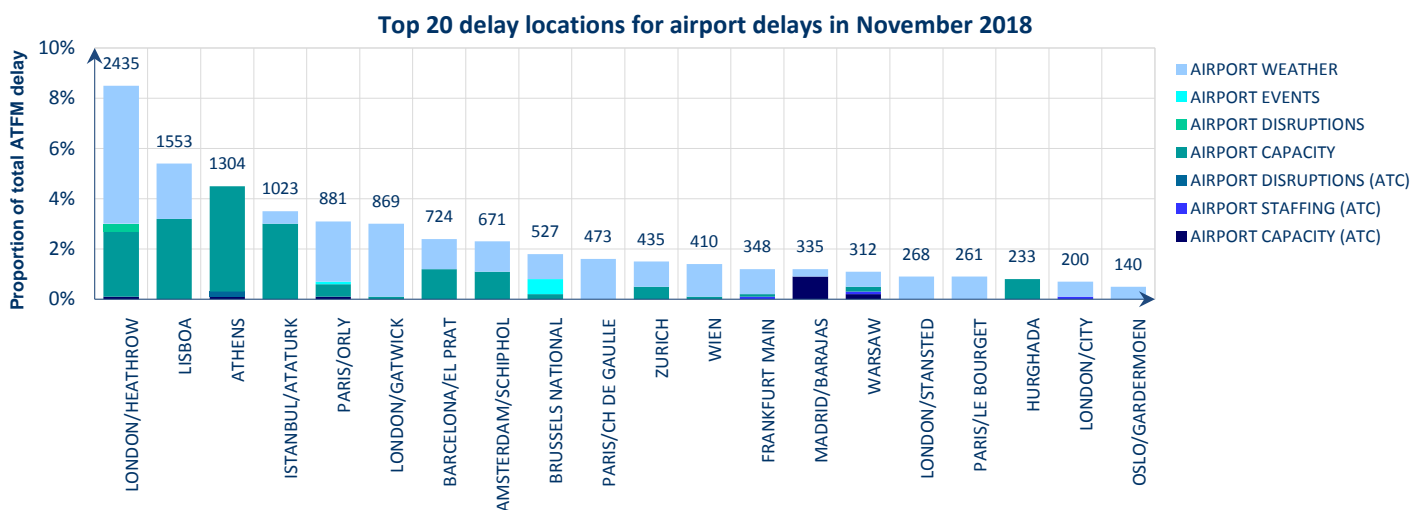
An average of 1,325 flights/day had an en-route ATFM delay of at least 15 minutes in 2018. The corresponding figure in 2017 was 631 flights/day.

The top 3 locations for flights with 15 minutes or more en-route ATFM delay (year-to-date) are:
- Karlsruhe UAC with 272 flights/day
- Marseille ACC with 200 flights/day
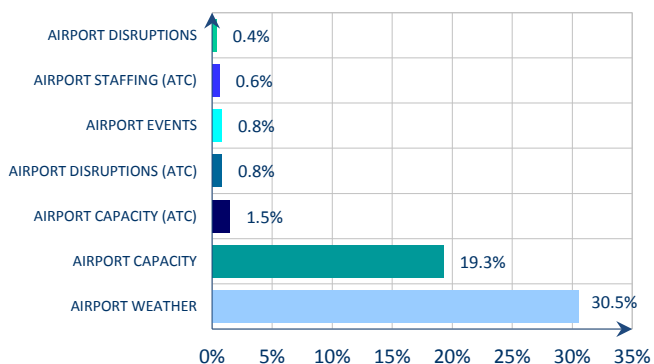- Maastricht UAC with 104 flights/day

4. AIRPORT/TMA ATFM DELAYS

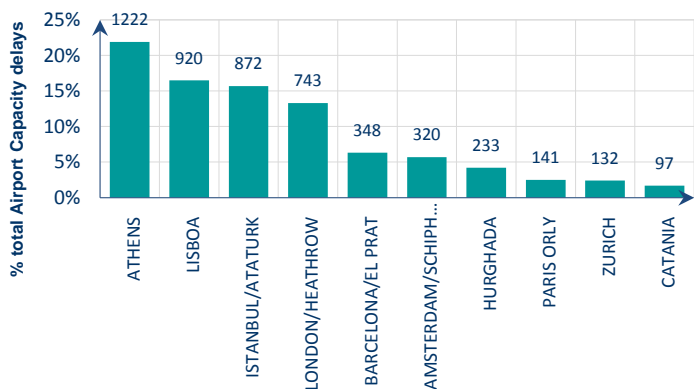## AIRPORT/TMA ATFM DELAY PER LOCATION

Top 20 delay locations for airport delays in November 2018

Legend:
- AIRPORT WEATHER
- AIRPORT EVENTS
- AIRPORT DISRUPTIONS
- AIRPORT CAPACITY
- AIRPORT DISRUPTIONS (ATC)
- AIRPORT STAFFING (ATC)
- AIRPORT CAPACITY (ATC)

Values (left to right): LONDON/HEATHROW 2435, LISBOA 1553, ATHENS 1304, ISTANBUL/ATATURK 1023, PARIS/ORLY 881, LONDON/GATWICK 869, BARCELONA/EL PRAT 724, AMSTERDAM/SCHIPHOL 671, BRUSSELS NATIONAL 527, PARIS/CH DE GAULLE 473, ZURICH 435, WIEN 410, FRANKFURT MAIN 348, MADRID/BARAJAS 335, WARSAW 312, LONDON/STANSTED 268, PARIS/LE BOURGET 261, HURGHADA 233, LONDON/CITY 200, OSLO/GARDERMOEN 140

AIRPORT/TMA ATFM DELAY PER DELAY GROUPS

Reasons for airport delays in November 2018

- AIRPORT DISRUPTIONS — 0.4%
- AIRPORT STAFFING (ATC) — 0.6%
- AIRPORT EVENTS — 0.8%
- AIRPORT DISRUPTIONS (ATC) — 0.8%
- AIRPORT CAPACITY (ATC) — 1.5%
- AIRPORT CAPACITY — 19.3%
- AIRPORT WEATHER — 30.5%

Airports accounted for 53.9% of all ATFM delays in November 2018, mainly due to airport weather and capacity.
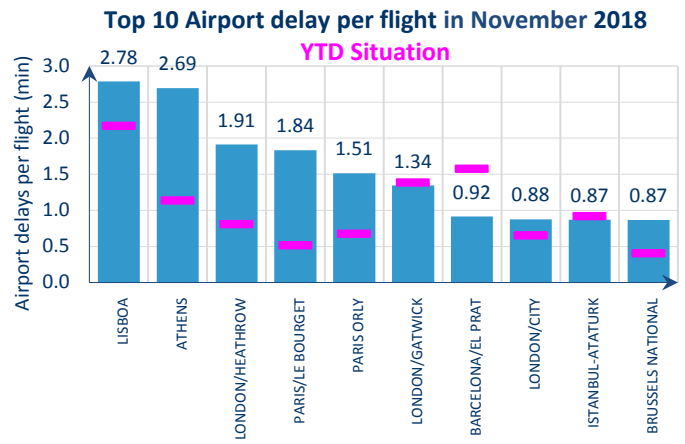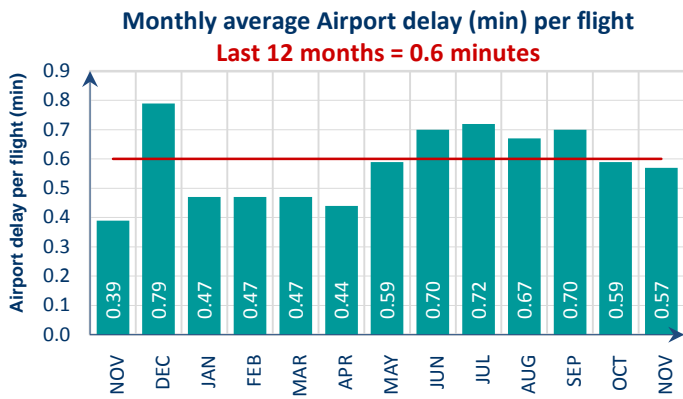
Top Airport Capacity delays in November 2018

Values: ATHENS 1222, LISBOA 920, ISTANBUL/ATATURK 872, LONDON/HEATHROW 743, BARCELONA/EL PRAT 348, AMSTERDAM/SCHIPH... 320, HURGHADA 233, PARIS ORLY 141, ZURICH 132, CATANIA 97

Airport capacity in conjunction with planned maintenance at Athens airport generated delays.

Top Airport Weather delays in November 2018

Values: LONDON/HEATHROW 1585, LONDON/GATWICK 827, PARIS ORLY 706, LISBOA 632, PARIS CH DE GAULLE 473, WIEN SCHWECHAT 385, BARCELONA/EL PRAT 358, AMSTERDAM/SCHIPHOL 351, ZURICH 303, FRANKFURT MAIN 297
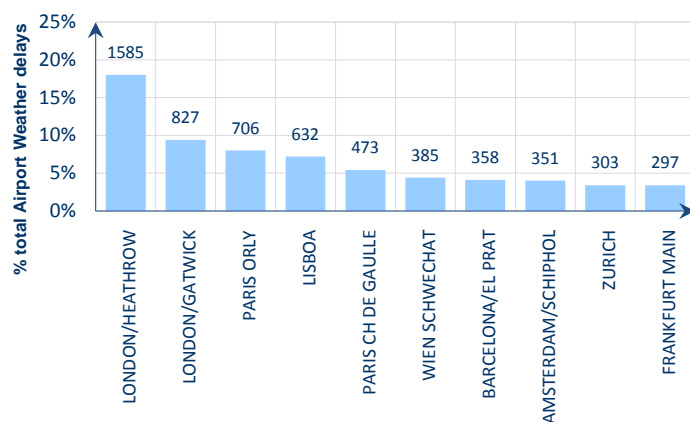
Wind direction in conjunction with works on runway exit points at London/Heathrow airport generated high delays with a peak of 16,493 minutes on 27 November.
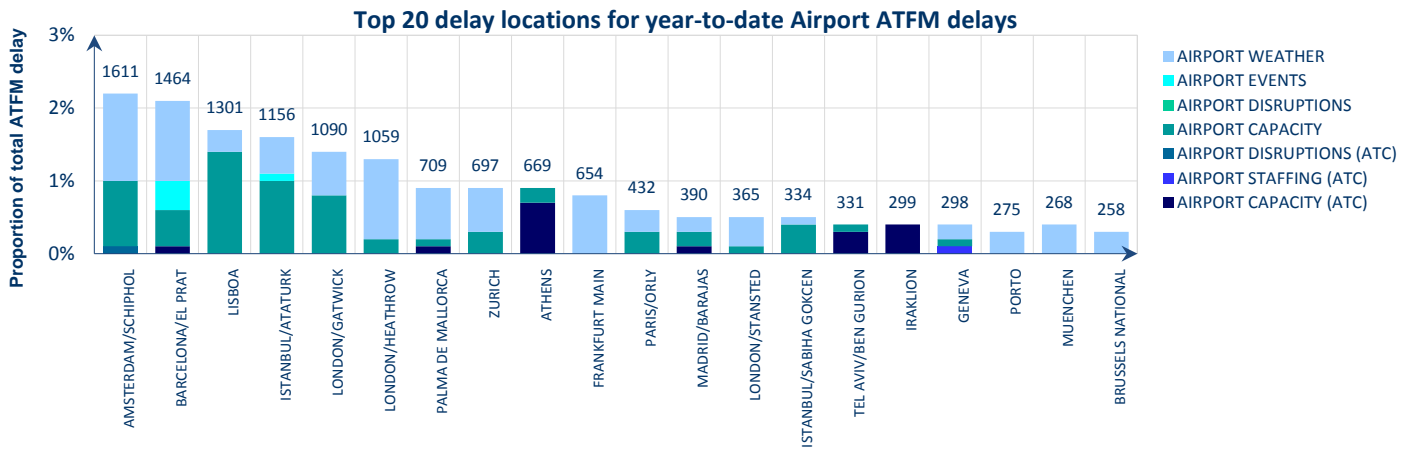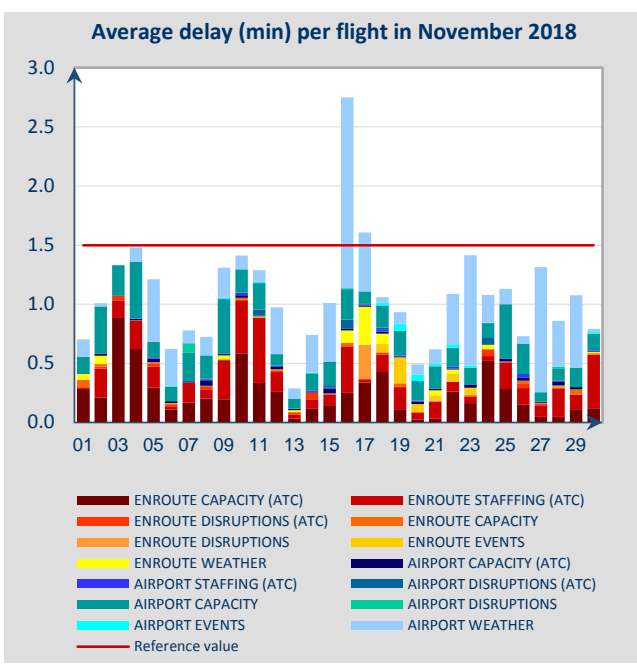
AIRPORT/TMA ATFM DELAY PER FLIGHT

Monthly average Airport delay (min) per flight
Last 12 months = 0.6 minutes

Top 10 Airport delay per flight in November 2018
YTD Situation

Average airport/TMA delay per flight increased from 0.39 min/flt in November 2017 to 0.57 min/flt in November 2018.

Athens airport generated an average delay per flight well above its year to date average mainly due to airport capacity issues related to runway maintenance. Seasonal weather impacted operations at Paris/Le Bourget airport.

AIRPORT/TMA ATFM DELAY YEAR-TO-DATE

Top 20 delay locations for year-to-date Airport ATFM delays

5. DAILY EVOLUTION

Average delay (min) per flight in November 2018

Two days in November 2018 had an average ATFM delay per flight exceeding 1.5 min. These were the most significant days:

16 November: Low visibility over north-west Europe resulted in high delays at London and Paris airports, and to a lesser extent at Amsterdam/Schiphol airport; ATC staffing issues in Maastricht, Karlsruhe, Marseille, Reims and Langen ACCs; ATC capacity delays in Prague, Karlsruhe and Paris ACCs; Airport capacity delays at Lisbon airport due to military activities to the north of the airfield;
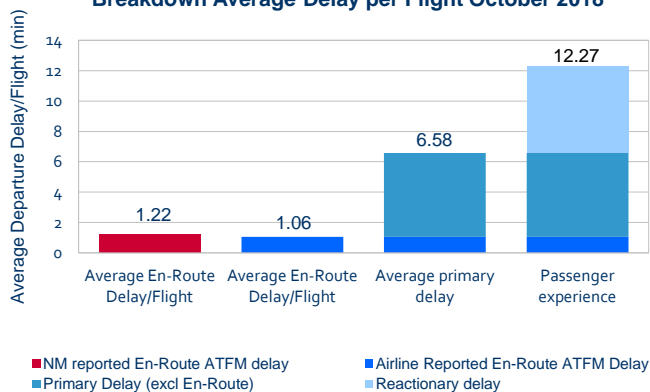
17 November: Strong winds in the approach sectors in Canarias ACC generated high delays; Additional weather measures were applied at Gran Canaria, Lanzarote and Fuerteventura airports; En-route ATC capacity delays in Karlsruhe and Lisbon ACCs; Disruptions delays in Marseille and Brest ACCs due national protests in France; Airport capacity issues at Istanbul/Atatürk airport.

6. ALL AIR TRANSPORT DELAYS (SOURCE: CODA)

This section presents the all air transport delay situation as seen from the airlines by using the data collected by Central Office for Delay Analysis (CODA) from airlines. Data coverage is 64% of the commercial flights in the ECAC region for October 2018. ATFM delays reported by airlines could be lower than the NM calculated ATFM delays due to difference in methods: ATFM delays of NM are the (flight) planned "delays"; the airlines report the "actual" experienced ATFM delay on departure.

For instance, a flight with an ATFM delay may also have a handling delay absorbed within the ATFM delay. In the event of a long delay an example being during ATC industrial action a flight may keep its original schedule, however when it's flight plan is submitted for example a day later any ATFM delay allocated may be lower or zero, in this case airline reported delay will exceed NM reported ATFM delay.

Breakdown Average Delay per Flight October 2018

- ■ NM reported En-Route ATFM delay
- ■ Airline Reported En-Route ATFM Delay
- ■ Primary Delay (excl En-Route)
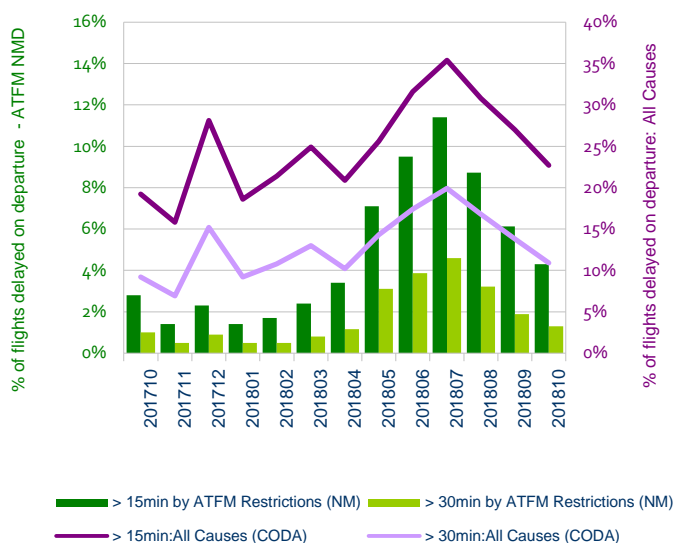- ■ Reactionary delay

Based on airline data, the average departure delay per flight from 'All-Causes' was 12.3 minutes per flight, an increase in comparison to October 2017. Primary delays counted for 53.7% or 6.6 min/flt, with reactionary delays representing the smaller remaining share of 46.3% at 5.7 min/flt, an increase of 0.7min/flt compared to October 2017. The increase in primary delays was mainly driven by an increase in airline delay (+0.3 min/flt) and reported ATFM en-route delays (+0.2 min/flt).

Average Departure Delay per Flight 2017/2018

- ■ Average reactionary delay per flight (CODA)
- ■ Average delay per flight Other Primary delay All Causes (CODA)
- ■ Average ATFM en-route delay per flight (CODA)
- — Average ATFM en-route delay per flight (NM reported)
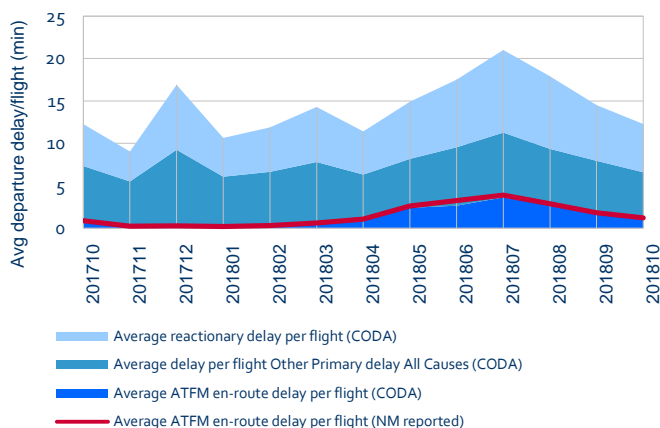
Further analysis of the past 12 months shows that the monthly average 'All-Causes' en-route ATFM delay reported by airlines remains high at 1.1 minutes per flight in October 2018. ATFM delays in October 2018 were mostly generated by en-route ATFM Regulations caused by ATC capacity, ATC staffing and en-route weather. The 46.3% share of reactionary delays in October 2018 is lower than the share observed during the last three months, however it is higher than October 2017 where the share was 44%.

Percentage of Delayed Flights: ATFM & All Causes

- ■ > 15min by ATFM Restrictions (NM)
- ■ > 30min by ATFM Restrictions (NM)
- — > 15min:All Causes (CODA)
- — > 30min:All Causes (CODA)

The percentage of flights delayed greater than 15 minutes from 'All-Causes' increased by 3.5 percentage points to 22.7% compared to the same period last year. All-causes delays exceeding 30 minutes also increased slightly to 10.9% of flights. 4.3% of flights in October 2018 experienced an ATFM delay exceeding 15 minutes with 1.3% of flights having an ATFM delay exceeding 30 minutes.

For more information on CODA delays:
https://www.eurocontrol.int/sites/default/files/publication/files/flad-october-2018.pdf

7. ATFM SLOT ADHERENCE

**Average daily evolution of early and late flights**
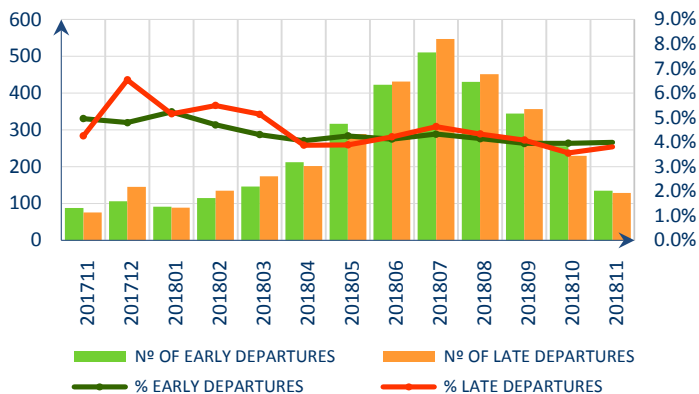
The percentage of early departures for November 2018 is 4.0% of regulated flights, which is a decrease of 1.0 percentage points compared to November 2017.

The percentage of late departures for November 2018 is 3.8% of regulated flights, which is a decrease of 0.5 percentage points compared to November 2017.

The chart below shows the airports that have more than 300 regulated flights during the month with their average daily number and proportion of regulated flights that departed outside of the Slot Tolerance Window (STW). Any airport above the red line is non-compliant with the threshold (20%). Those airports with a number of departures outside the slot tolerance window can reduce network predictability.

Proportion of regulated flights outside the Slot Tolerance Window in November 2018
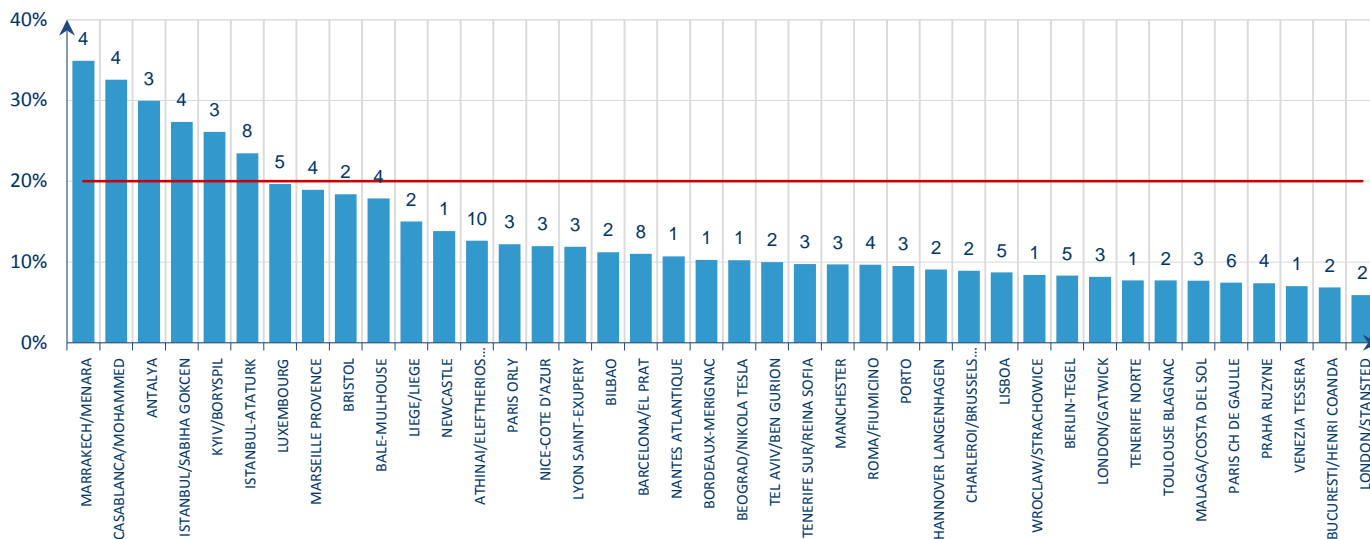
8. SIGNIFICANT EVENTS AND ISSUES

PLANNED EVENTS

ACC

MAJOR AIRSPACE OR ATM SYSTEM IMPROVEMENT PROJECTS

Planned Events

Brussels ACC upgraded the hardware of the CANAC 2 system between 17 and 26 November generating 14,443 minutes of en-route ATFM delay, and an additional 5,423 minutes of airport ATFM delay. Capacity reductions of 25% for all elementary sectors had been previously planned, as well as maximum arrivals at EBBR of 36 fights per hour, for the same period.

Radar maintenance in Lisbon ACC generated 9,058 minutes of ATFM delay throughout the month;

Continuing refurbishment of control center facility in Clermont/Ferrand generated 1,766 minutes of ATFM delay.

AIRPORTS

Local Plans in November
A number of airports undertook infrastructure and technical system improvement works during November. These improvements as well as some special events had at most a minor impact on local airport operations, unless otherwise stated.

Special Events

- World War Centenary ceremony and rehearsal at Lisbon airport generated 3,917 minutes of ATFM delay on 3 and 4 November;
- Military air display and rehearsal at Iraklion airport on 9 and 11 November;
- Lanzarote and Fuerteventura connected to the network as Advanced ATC Tower airports on 20 November;
- Implementation of new airport operator database system at Stockholm/Arlanda on 27 and 28 November.

Completed

- Runway maintenance/closure at Athens (generated 35,284 minutes of ATFM delay), Barcelona (generated 6,888 minutes of ATFM delay), Cologne, Krakow, Warsaw/Chopin (generated1,977 minutes of ATFM delay) and Stuttgart airports;
- Taxiway and/or apron improvements at Catania/Fontanarossa (generated 2,899 minutes of ATFM delay), Frankfurt/Main and Zurich airports.

Ongoing

- Runway maintenance/closure at Istanbul/Sabiha Gökcen, Malaga, Nice and Olsztyn/Mazury airports;
- Taxiway and/or apron improvements at Bergamo, Ibiza, Katowice, Larnaca, London/Heathrow (7,920 minutes of ATFM delay), Manchester, Malta, Munich, Paris/Orly (4,133 minutes of ATFM delay), Porto, Rome/Fiumicino, Tenerife/Sur and Venice airports;
- ILS maintenance at Milano/Malpensa (generated 3,037 minutes of ATFM delay) airport;
- Terminal building improvements/works at Frankfurt/Main, Manchester, Oslo/Gardermoen and Paris/Charles de Gaulle airports.

DISRUPTIONS

Technical

- Technical issues with radar equipment at Dublin airport generated 1,404 minutes of ATFM delay on 24 November.

Other

- National protests "Gilets jaunes" in France on 17 November generated 4,580 minutes of ATFM delay.

9. NM ADDED VALUE

FLIGHTS WITH DELAY > 30'

The number of flights with more than 30 minutes of ATFM delay increased by 70.2% between November 2017 and November 2018.
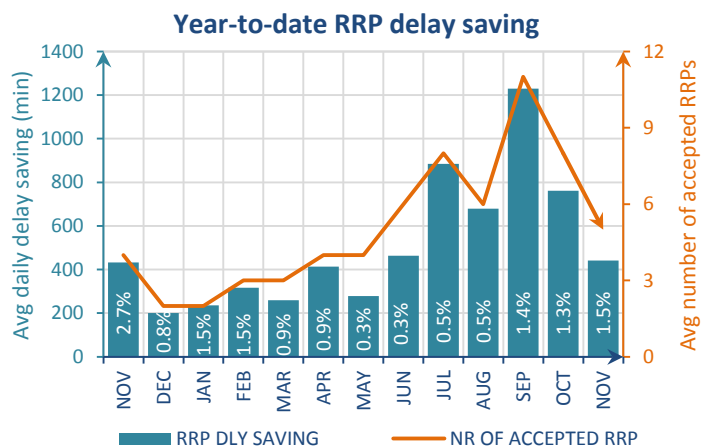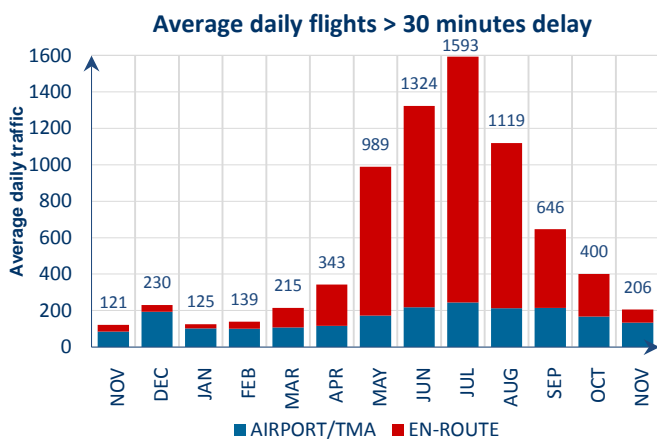
In November 2018, 35.0% of flights with more than 30 minutes of ATFM delay were en-route and 65.0% were airport.

An average 37 flights per day had their delay reduced to less than 30 minutes by NM.

RRP DIRECT DELAY SAVINGS

On average 5 RRPs/day were executed saving 441 min/day, accounting for 1.5% of ATFM delays.

This graph shows the actual daily averages for the previous 13 months' period[v].

Average daily flights > 30 minutes delay

Year-to-date RRP delay saving

Contact Us
Operational Analysis & Reporting,
Performance, Forecasts and Relations (PFR) Unit,
Network Manager Directorate (NMD),
EUROCONTROL,
96 Rue de la Fusée,
B - 1130 Brussels

e-mail: nm.ops.perf@eurocontrol.int
http://www.eurocontrol.int/articles/network-operations-monitoring-and-reporting

i See Notice on page 2 for more information on traffic and delay comparison.
ii Internals, international arrivals and departures, excluding overflights.
iii See Notice on page 2 for more information on NM Area .
iv NM's calculation that provides the guideline en-route delay (min) requirements to achieve the annual target (0.5 min/flight).
v NM has revised the delay saving method. Where flights are subject to scenarios, delay savings from RRPs are considered when the RRP is sent 3 hours (or less) in advance of the EOBT.