CODA DIGEST 2018

All-Causes Delay and Cancellations to Air Transport in Europe - 2018

EUROCONTROL

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Table of Contents

CODA DIGEST 2018

15 mins Arrival Punctuality	Flights arriving > 15 minutes ahead of schedule	Main Delay Causes 2018 in mins/flight		2018 Departure Delay (from all causes)
75.8%	**Early Arrivals**	Reactionary	**6.7**	**14.7** mins/flight
-3.9%pts vs. 2017	**9.5%** **-0.2%pts**	Airline	**3.6**	**+2.3 mins** vs. 2017
		ATFM En-Route	**1.7**	

1   Executive Summary

Airline punctuality **deteriorated** in 2018, with **75.8% of arrivals punctual** compared to 79.7% in 2017, with **early arrivals** stable at **9.5%**.

Delays due to **airline operations** remained the main cause of primary delay, contributing 3.6 minutes to the average delay per flight, a **0.3 minute per flight increase** compared to 2017.

Airlines reported that **en-route ATFM delays increased significantly** at 1.7 minutes per flight. Major reasons driving this were ATC staffing issues as well as convective weather in the summer. Industrial actions also occurred during the year causing further en-route delays.

Reactionary (knock-on) delay added **6.7 minutes** to the average delay per flight due to an increase in primary delays (where ATFM en-route delay saw the largest increase). However, its proportion remained stable with a 45% share of total delay minutes.

Traffic growth also contributed to delays, average daily traffic **increased** by 3.8% in 2018 compared to 2017. In fact traffic growth may well have been higher had the delay situation not contributed to **a jump in operational cancellations,** which increased to 2.0% (from 1.5% in 2017).

Put together, all these factors resulted in an **average all-causes departure delay of 14.7 minutes per flight,** up by more than 2.3 minutes per flight on 2017 where the average delay per flight was 12.4 minutes.

2   Traffic and Average Delay per Flight Overview

Figure 1. Total Flights per Day in ECAC

IFR Flights/Day in ECAC

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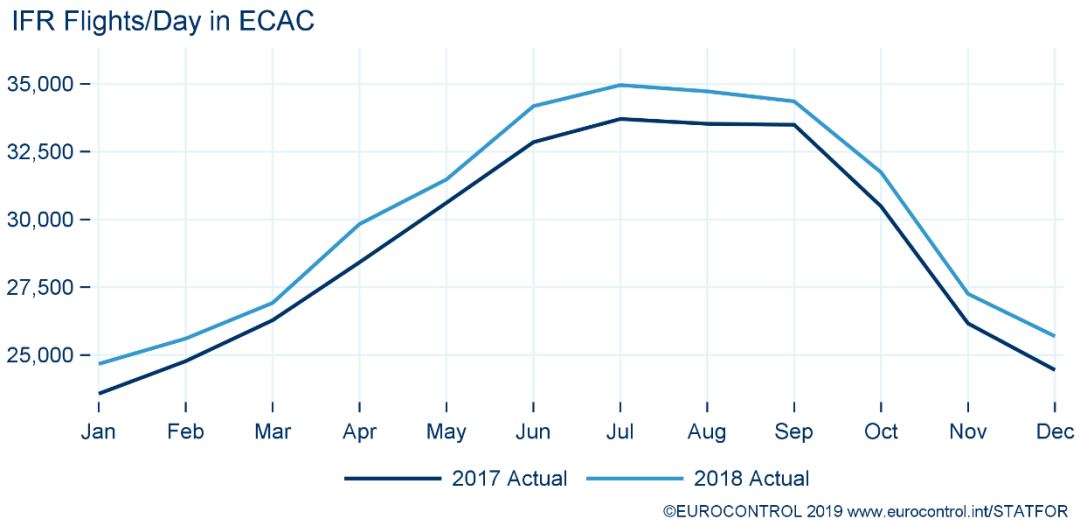
European flights (ECAC) in average daily terms increased by 3.8% in 2018 compared with 2017 in line with the October 2018 forecast. Within this record year for traffic, the network experienced its busiest day ever on 7 September with 37,088 flights. Further information regarding traffic and forecasts can be found on the STATFOR website and via the STATFOR Interactive Dashboard (SID).

Figure 2. Breakdown of the Average Delay per Delay Flight 2017 vs. 2018

All-causes, airline-reported delay: Main categories

TOTALS: (mins/flt)
2017   12.4
2018   14.7

Based on CODA sample of 70.1% of commercial flights in the ECAC region in 2018
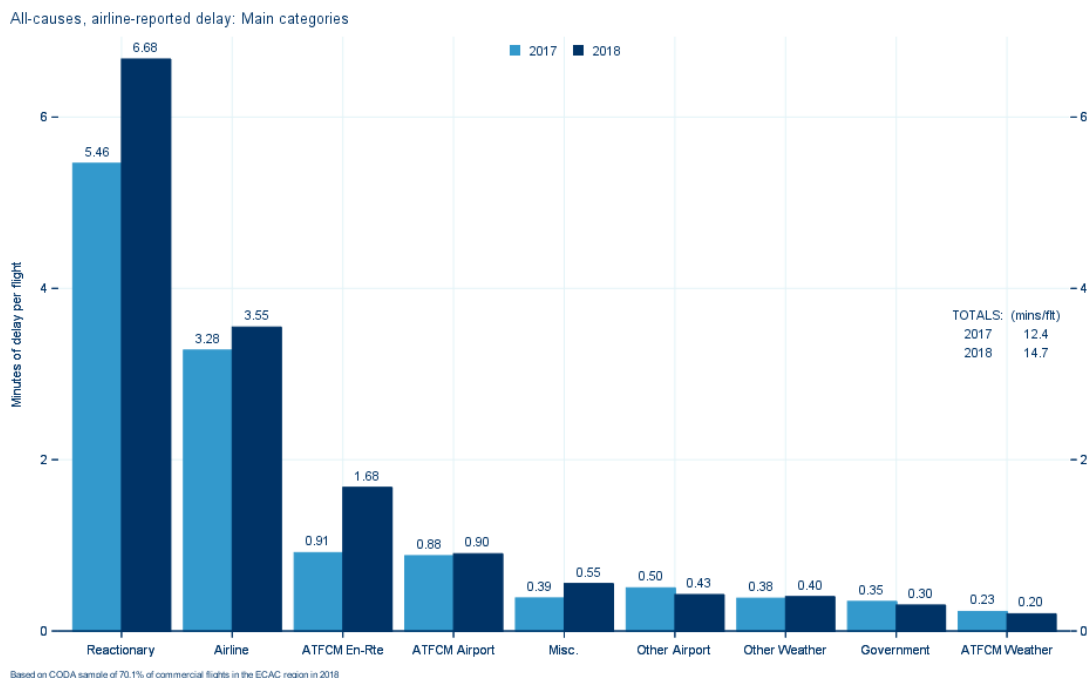
2018 saw an average departure delay per flight of 14.7 minutes for all-causes delay, an increase of 19% in comparison to 2017. Analysis of the delay reasons shows that reactionary delays contributed the most to the average delay with 6.7 minutes per flight. Airline-related delays increased to 3.6 minutes per flight. En-route ATFM delay increased significantly to 1.7 minutes per flight.

Miscellaneous delays increased by 0.2 minutes, this can occur when the airline was unable to find a suitable IATA delay code as the root cause is unknown, it can also come from industrial actions outside the own airline but not ATC strikes which would fall under an ATC delay group.

Figure 3. Primary Delay Causes 2017 vs .2018

Total ATFM delays (airport, en-route and weather delay) reported by airlines increased to 2.8 minutes per flight, with en-route ATFM delay contributing 1.7 minutes flight, predominantly caused by ATC capacity and ATC staffing issues. ATFM weather and airport delay increased slightly in the year.

Figure 4. Long Departure Delays >60 Minutes
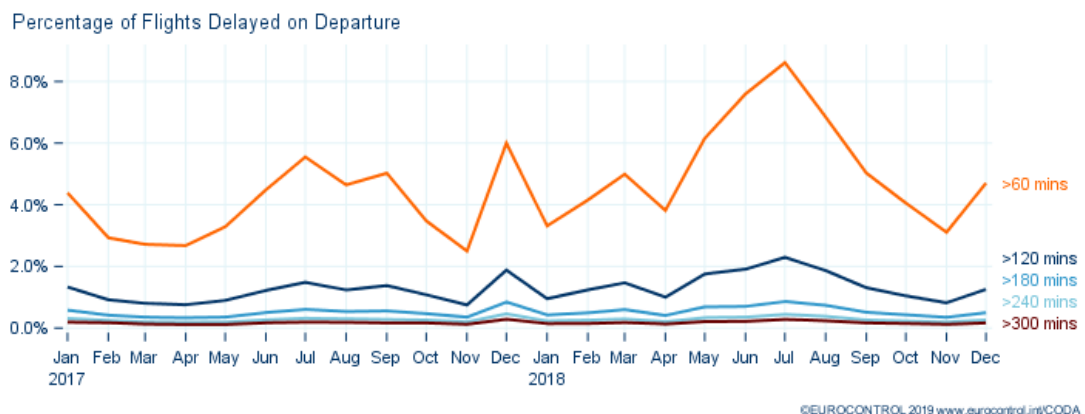
In 2018, longer delays (those greater than 60 mins in orange) increased when compared to 2017 with 5.3% of flights experiencing long delays compared to 4.0% in 2017. July (8.6%) saw a peak in delays as convective weather influenced airline operations. Delays greater than 120 minutes also peaked in July 2018. December 2018 fared better than December 2017, with less cold weather in the month disrupting operations.

3   2018 Monthly Summary

Section 3 provides a month-by-month view for 2018, highlighting the particular locations, causes of delay or disruptions in further detail.

January 2018. Seasonal weather affected operations strongly at Amsterdam Schiphol, London Heathrow and Oslo Gardermoen airports and, to a lesser extent, at Istanbul Ataturk, London Stansted, Madrid Barajas, Frankfurt, Porto, Zurich and Stockholm Arlanda airports. ATC staffing issues generated ATFM en-route delays in Karlsruhe UAC (Upper Area Control centre).

February 2018. Seasonal weather impacted operations at London Heathrow, Barcelona, Istanbul Ataturk, Paris Orly, Stockholm Arlanda and Zurich airports. Severe weather conditions (snowstorms) in UK, Ireland and across Western Europe throughout the month led to multiple flight cancellations. ATC staffing issues generated ATFM en-route delays in Karlsruhe UAC.

March 2018. Seasonal weather influenced operations at Istanbul Atatürk, Amsterdam Schiphol, London Heathrow and Geneva airports. There were capacity issues at Istanbul Atatürk and Amsterdam Schiphol airports. ATC staffing issues generated ATFM en-route delays in Karlsruhe UAC (Upper Area Control centre).
An Italian ATC industrial action on 08 March and a French ATC industrial action from 21 March to 23 March generated additional ATFM en-route delays and caused an increase in flight cancellations.

April 2018. ATC industrial action in France caused increased ATFM delay, notably during the first rotation hours which in turn caused an increase in reactionary delays for airlines.
Industrial action in Marseille ACC caused disruption on 07 to 09 April and 28 to 30 April. Karlsruhe UAC, Maastricht UAC and Brest ACC suffered from ATC staffing and ATC capacity delays. Concerning airports, Istanbul Ataturk and Amsterdam Schiphol continued to suffer from capacity issues. London Heathrow, London Stansted and Amsterdam Schiphol were also affected by weather this being mainly due to winds.

May 2018. Airline-reported ATFM delays doubled, mainly because of ATC industrial action in France and convective weather. Weekend industrial action in Marseille ACC caused disruption on 5-07; 12-14; 21-23 and 26-28 May. UAC's Karlsruhe, Maastricht, Langen, London and Vienna suffered from thunderstorms in May. As for airports, Frankfurt had weather issues on 23-24 May and Amsterdam Schiphol on 29 May.

June 2018. ATFM en-route delay doubled following ATC capacity and staffing delays, ATC industrial action in France and convective weather. Industrial action held on the weekends at the Marseille ACC on 9-11, 16-18 and 23-25 June as well as the Italian ATC industrial action of 8 June also caused disruption.
The other major delay generator was adverse weather, especially en-route. Thunderstorms affected large areas of North West Europe, especially in Karlsruhe and Maastricht UACs' airspace between 06 and 11 June. Between 1 and 3 June, convective activity dominated the network, particularly in Germany, France and central Europe. Weather made for delays in Vienna, Karlsruhe, Maastricht, Prague and Brussels ACCs.

July 2018. Thunderstorms affected large areas of North West Europe with intense local convective activity in Karlsruhe, Marseille ACC's as well as Barcelona and Frankfurt Airports. Frequency problems in Bordeaux ACC during several days, a network connectivity issue in Brest ACC on 09 July. An aircraft incident at London Gatwick airport (06 July), the evacuation of the ATC tower facility at London Heathrow airport due to fire alarm (18 July) and the terminal evacuation at Munich airport due to security issues on 28 July generated delays throughout the month. An FDPS failure occurred in Brussels ACC on 19 July, NM estimates that there were 150 less flights

August 2018. Weather had a significant impact throughout the month and affected large areas of North Western Europe with intense local convective activity in Marseille, Karlsruhe and Vienna ACCs.

Thunderstorms and strong winds affected operations at Amsterdam Schiphol, Barcelona, Frankfurt, Nice and Palma de Mallorca airports. There were delays due to ATC staffing in Marseille, Brest, Reims, Maastricht, Budapest, Karlsruhe, Langen, Vienna and Makedonia ACCs.

September 2018. Throughout the month, weather disrupted operations in central Europe, the Balkan Peninsula and in the northern part of Germany. There were ATC staffing issues in Marseille, Karlsruhe, Brest, Nicosia, Langen, Vienna, Maastricht, Warsaw and Reims ACCs as well as ATC equipment issues in Ankara ACC and Maastricht UAC.

Aerodrome capacity issues at Lisbon, Tel Aviv, Istanbul Ataturk, Istanbul Sabiha Gökcen, Amsterdam Schiphol, London Gatwick airports also occurred. The network experienced its busiest day ever on 7 September with 37,088 flights.

October 2018. En-route ATFM delays increased mainly due to ATC capacity delays in Karlsruhe UAC as well as ATC staffing delays in Marseille ACC. Seasonal weather affected Barcelona ACC and the London airports.

November 2018. Seasonal weather impacted operations strongly at London Heathrow, London Gatwick, Lisbon, Paris CDG, Paris Orly, Barcelona and Amsterdam airports. En-route ATFM capacity delays were generated in Karlsruhe, Lisbon, Canarias, Madrid, Barcelona and Prague ACCs. Athens airport suffered from airport capacity delays in conjunction with works in progress.

December 2018. In December, an industrial action in France (14 December) affected operations in Marseille, Brest, Paris, Bordeaux, Reims, Barcelona, Madrid and Karlsruhe ACCs. There were staffing issues on 14, 16 and 21 December in Marseille, Budapest and Karlsruhe ACCs. Weather conditions (strong winds and low visibility) impacted Amsterdam Schiphol, Frankfurt, Lisbon, Vienna, Madrid and London Heathrow airports on 16 and 21 December. Unauthorized drone activity in the vicinity of London Gatwick airport generated high delays. The airport was unavailable for flight operations on Wednesday 19 December until Friday 21 December resulting in 87 diversions and the cancellation of approximately 770 flights. On 22 December, ATC staffing issues were observed in Bordeaux and Maastricht ACCs and strong winds impacted Amsterdam Schiphol and London Heathrow airports. A volcanic eruption of Etna from 24 until 26 December generated delays at Catania airport.

4 Average Delay per Delayed Flight (Departure)

The average delay per flight (Figure 5) increased to 14.7 minutes per flight, compared to 12.4 minutes per flight in 2017, with higher delays throughout the summer season driving this increase. The average delay per delayed departure (Figure 6) increased by 2.5 minutes to a five year high of 30.5 minutes per flight in 2018. The percentage of flights delayed on departure (>=5 minutes) also increased, these to 48.4% in 2018 from 44.4% in 2017 and was the highest PDF in the last 5 years.

Figure 5. Average Delay per Flight (All-Causes) for Departures

Figure 6. Average Delay per Delayed Flight (All-Causes) for Departures

Figure 7. Percentage of Delayed Flights (All-Causes) for Departures

5 Average Delay per Delayed Flight (Arrival)

The average delay per flight on arrival showed a similar trend to that of the departure delay at 13.8 minutes per flight, an increase of 1.8 minutes per flight when compared to 2017. The average delay per delayed flight was 32.3 minutes per flight, an increase of 2.4 minutes when compared to 2017. The percentage of delayed arrivals also increased, this by 4.1 percentage points to 42.8%.

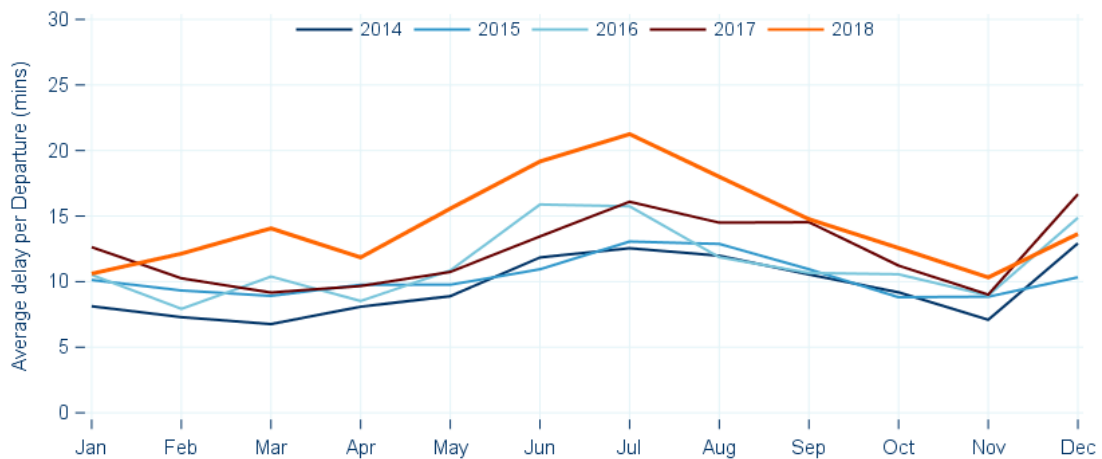**Figure 8. Average Delay per Flight (All-Causes) for Arrivals**
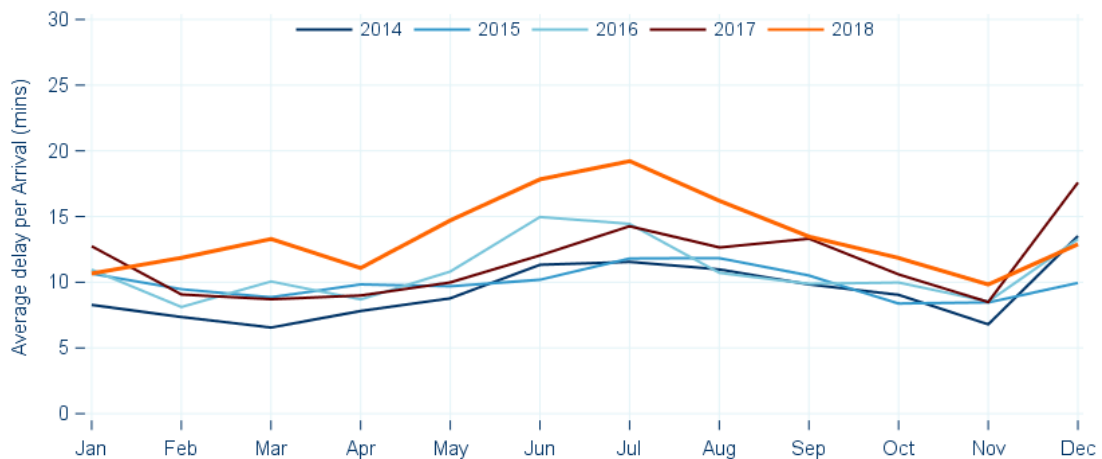
Figure 9. Average Delay per delayed Flight (All-Causes) for Arrivals

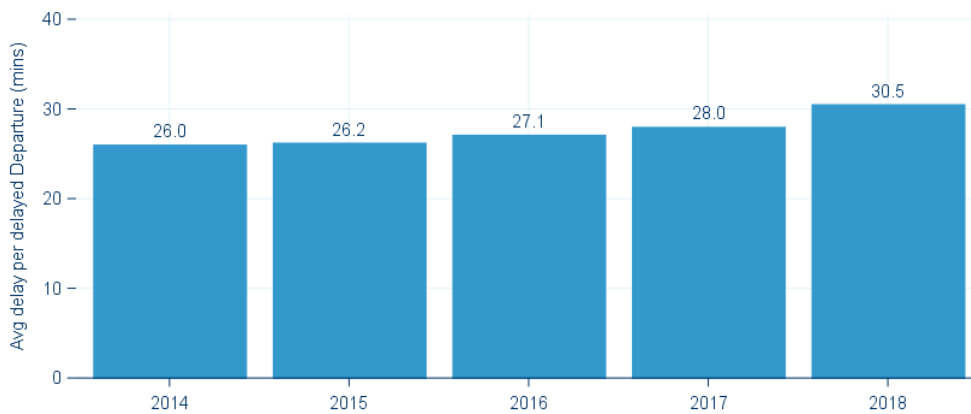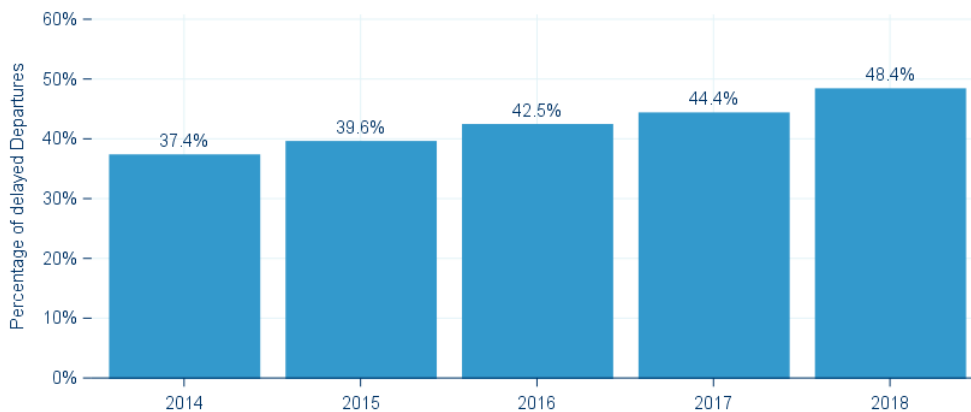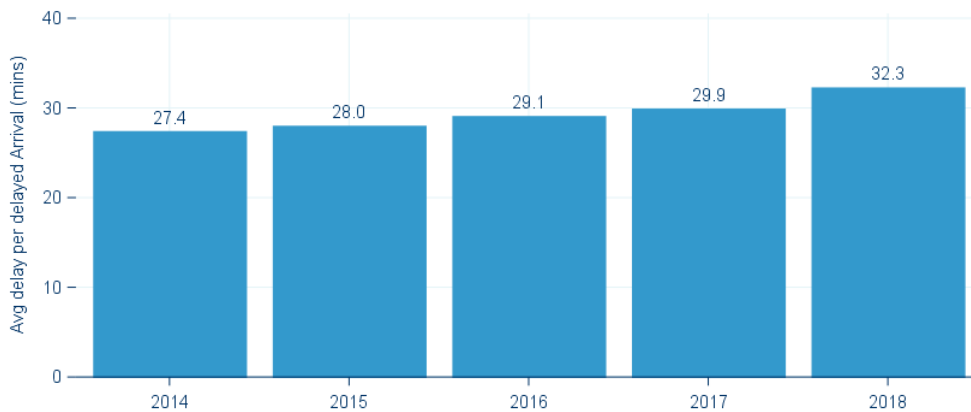**Figure 10. Percentage of Delayed Flight (All-Causes) for Arrivals**
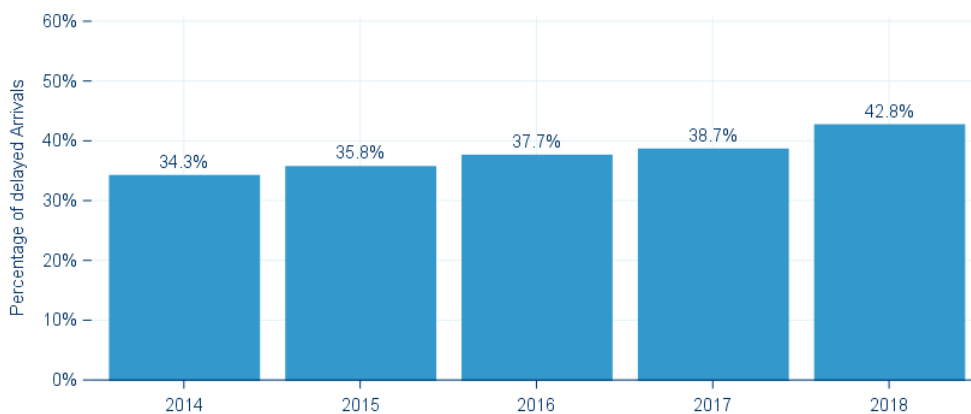
6   NM Versus Aircraft Operator Experience of Delay

Figure 11. Breakdown of Average Delay per Flight 2018 vs. 2017 (Network Manager vs. Aircraft Operator)

Breakdown Average Delay per Flight 2017

Average Departure Delay/Flight (min)

	Value
Average En-Route Delay/Flight	0.9
Average En-Route Delay/Flight	0.9
Average primary delay	6.9
Passenger experience	12.4

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

Breakdown Average Delay per Flight 2018

Average Departure Delay/Flight (min)

	Value
Average En-Route Delay/Flight	1.7
Average En-Route Delay/Flight	1.7
Average primary delay	8.0
Passenger experience	14.7

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

Airline data in Figure 11 shows that the average en-route ATFM delay from all-causes was 1.7 minutes per flight. This the same (as explained above) than the NM-recorded average en-route ATFM delay per flight for the year of 1.7 minutes per flight and an increase compared to the 0.9 minutes average en-route ATFM delay per flight during 2017.

ATFM delays calculated by NM are the (flight) planned "delays" based on restrictions applied; the airlines report the "actual" experienced ATFCM delay on departure. For instance, a flight with an ATFM restriction may also have a handling delay. For the airline, a part of this delay is the ATFM delay and the rest is the handling delay; for NM it is all ATFM delay.

In the event of a longer duration delay, an example being during ATC industrial action, a flight may keep its original schedule however when its 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.

Primary delays (e.g. passenger and ramp handling delays) counted for 55% (8.0 min/flt), with reactionary delays representing the remaining share of 45% (or 6.7 min/flt). This resulted in an average departure delay per flight of 14.7 minutes per flight as reported in previous sections.

7   Punctuality Distribution

In 2018 overall departure punctuality deteriorated, with 36.6% of flights departing within the 5 minute threshold before or after the scheduled departure time (STD). Flights delayed >30 minutes from all causes increased by 2.9 percentage points to 13.7% compared to 2017.

Figure 12. All-Causes Departure and Arrival Punctuality 2017 vs. 2018

All-Causes Departure punctuality

Based on CODA sample of 70.1% of commercial flights in the ECAC region in 2018   © EUROCONTROL 2019 www.eurocontrol.int/CODA

All-Causes Arrival punctuality

Based on CODA sample of 70.1% of commercial flights in the ECAC region in 2018   © EUROCONTROL 2019 www.eurocontrol.int/CODA
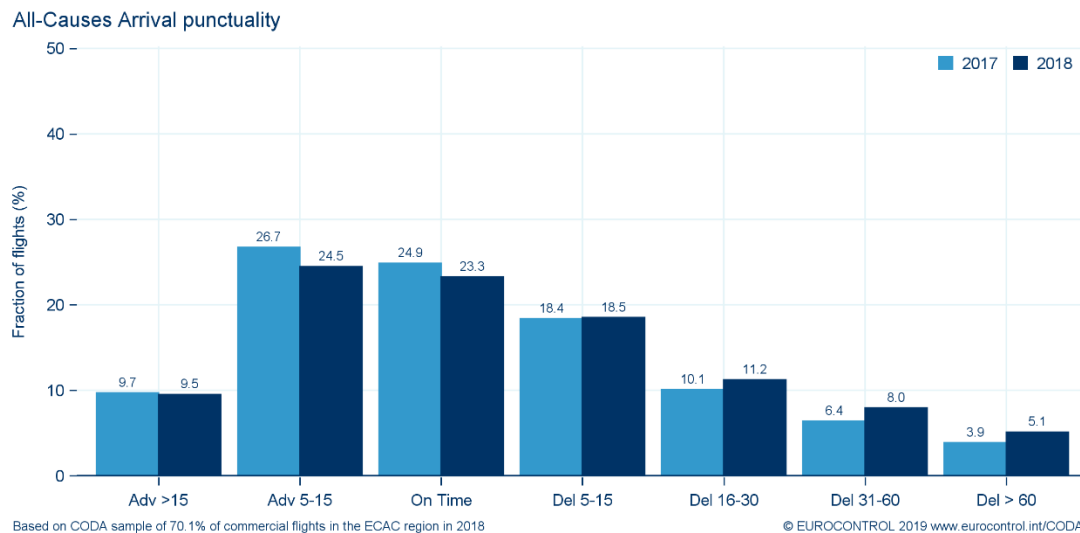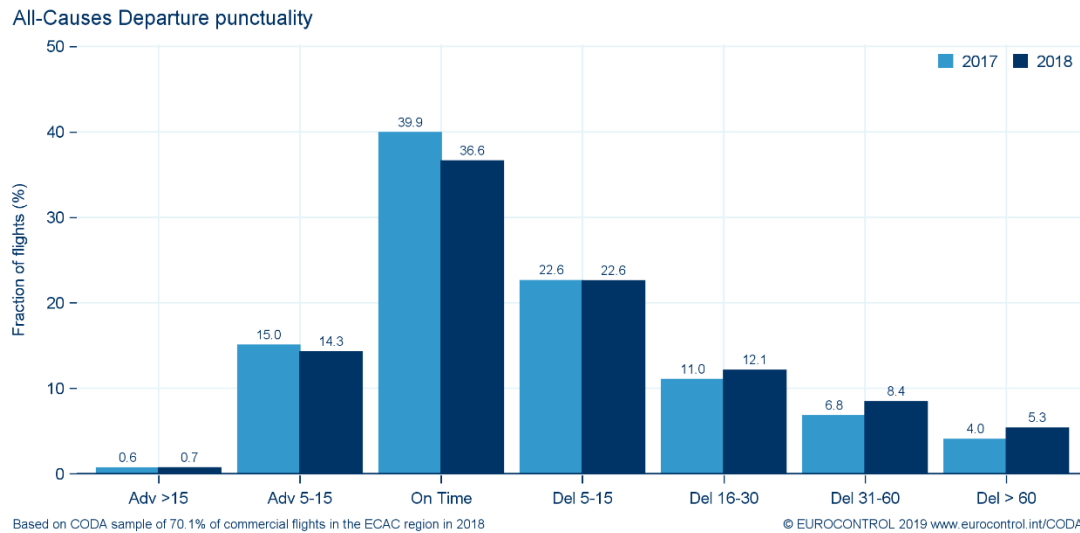
Airline arrival punctuality also fell, with 75.8% of flights arriving within 15 minutes or earlier than their scheduled arrival time (STA), compared to 79.7% in 2017.

Flights arriving >15 minutes ahead of schedule remained stable, decreasing by 0.2 percentage points to 9.5%. This high share may affect airport stand availability and air traffic flow management operations (demand shifts) in the event of aircraft frequently arriving excessively ahead of their schedule.

Figure 13. Top 50* Airlines by Arrival On-Time Performance 2018
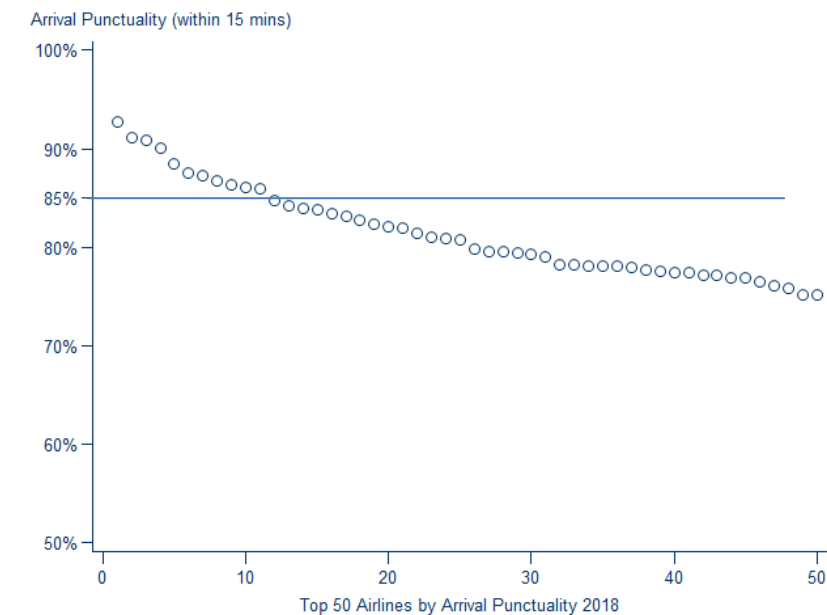
*The top 50 airlines reporting to CODA by number of flights. Arrival punctuality is calculated as the share of flights arriving within 15 minutes of the scheduled time (time of arrival at gate)

Figure 14. Top 50* Airlines by Arrival On-Time Performance 2017
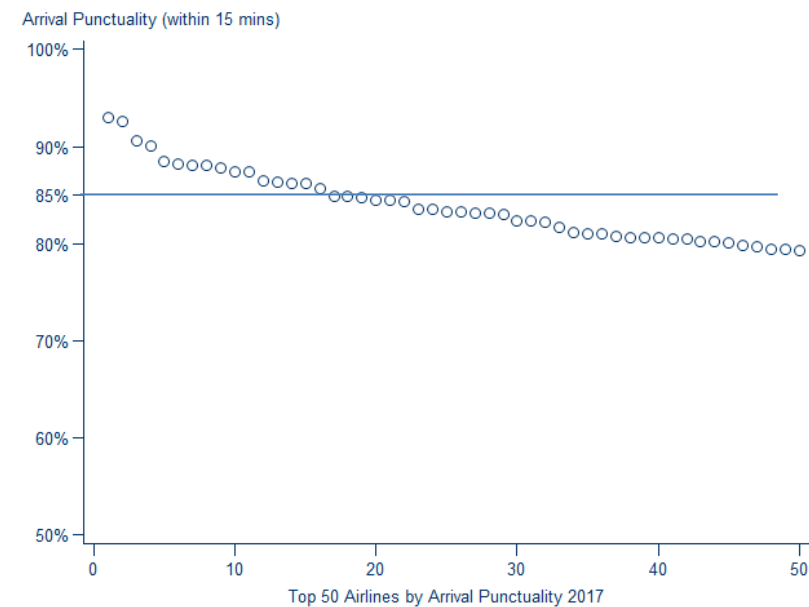
During the year, fewer airlines were able to maintain 15-minute arrival punctuality above 85%. A total of 12 airlines saw more than 85% of their flights arrive within 15 minutes of the scheduled time of arrival vs. 21 airlines in 2017.

8   Operational Flight Cancellations

These results are based on operational cancellation data supplied by 30 European coordinated airports reporting to CODA under EC Regulation N° 390 2013. Albeit based on data supplied by a restricted list (see the conditions below) of major European airports, these results already give a good indication of trends and effects of Network events like industrial actions or extreme weather.

The IFR flight coverage at the individual airports included in this analysis is 100%. Those airports currently unable to report operational cancellations in the required data format or those not meeting all of the criteria for operational cancellations were excluded from the analysis.

According to Annex V of EC Regulation N°390 2013 an 'Operational Cancellation' means an arrival or departure scheduled flight to which the following conditions apply:

•   The flight received an airport slot, and

•   The flight was confirmed by the air carrier the day before operations and or it was contained in the daily list of flight schedules produced by the airport operator the day before of operations, but

•   The actual landing or take-off never occurred.

Therefore this section of the CODA Digest reports on monthly and daily shares of operational cancellations of the total planned flights at day -1. Like delays, operational cancellations provide an insight into the impact of network events and associated disruption; e.g. industrial action or extreme weather events.

Figure 15. Monthly Rate of Operational Cancellations 2018
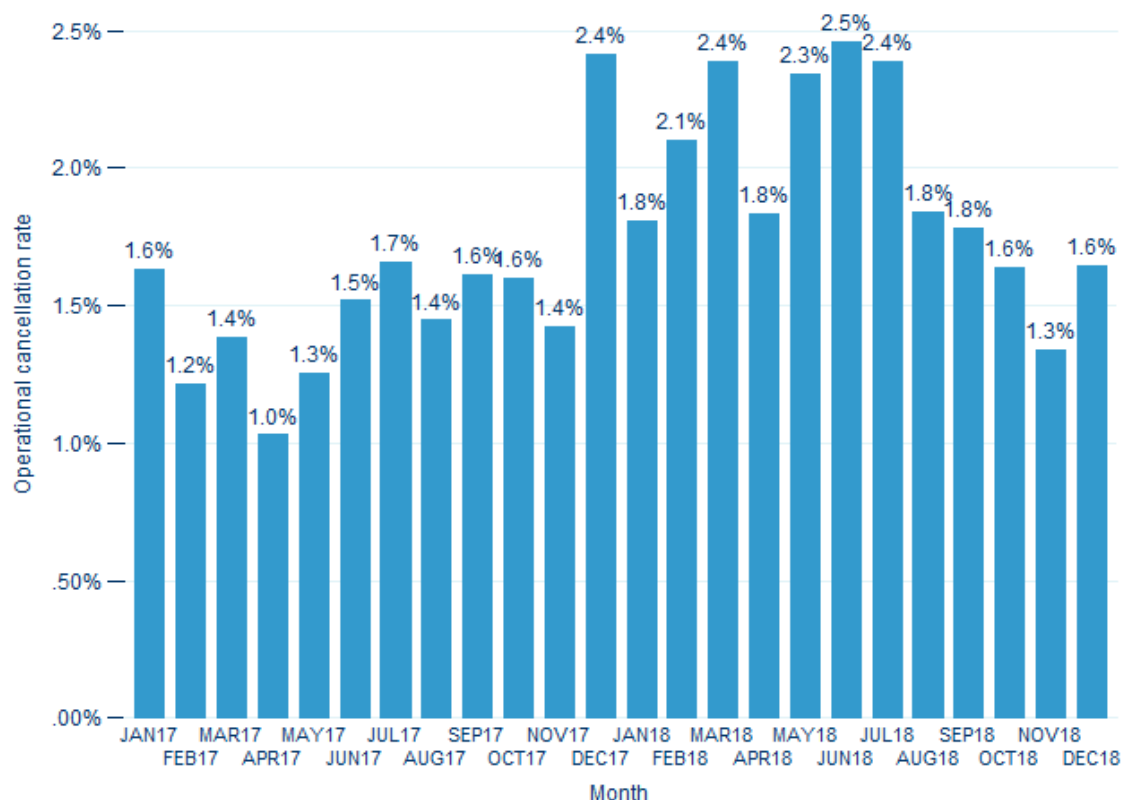
Figure 16. Average Daily Cancellation 2017 – 2018
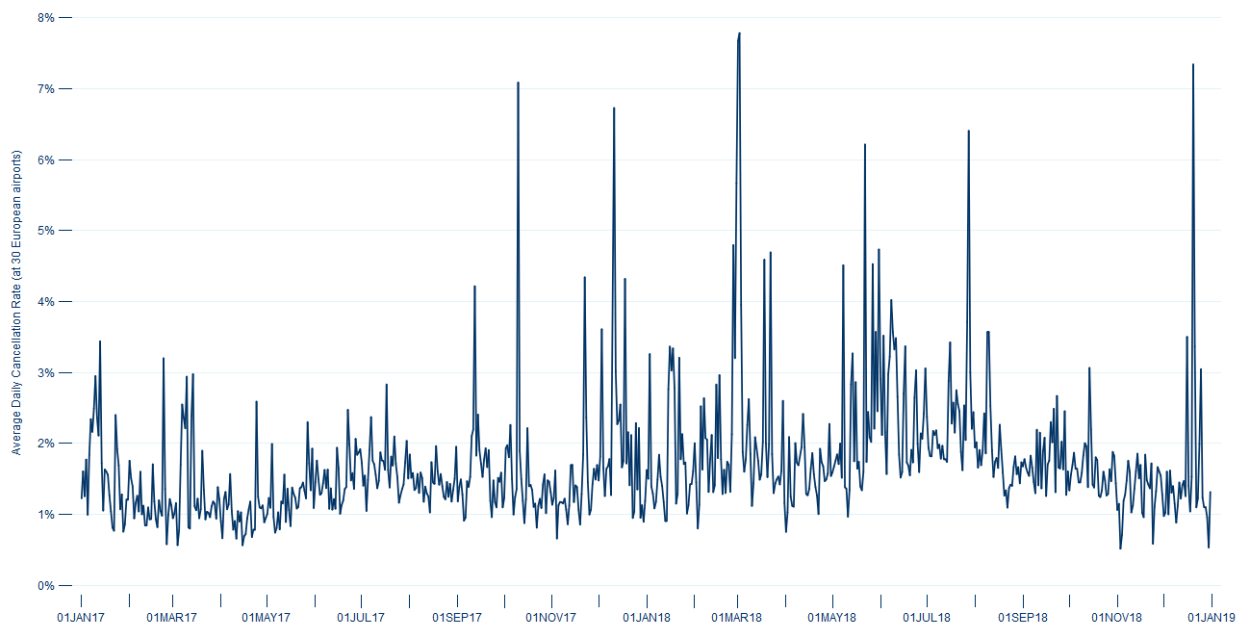
Figure 15 on page 11 shows the monthly rate of operational cancellations and Figure 16 provides the detail of cancellations by day from January 2017 to the end of December 2018. It should be noted that initial cancellations count as 'operational cancellations' under the terms of the regulation.

In 2018 the operational cancellation rate was 2.0% compared to 1.5% in 2017.

Severe weather conditions (snowstorms) in UK, Ireland and across Western Europe throughout February and March (including winter storm Emma between 26 February and 05 March 2018) led to widespread flight cancellations.

An Italian ATC industrial action on 08 March and a French ATC industrial action from 21 March to 23 March caused an increase in flight cancellations.

Convective weather conditions (thunderstorms) affected large areas of North West Europe and French industrial actions throughout Q2 2018 leading to peaks in daily operational cancellation rates.

In July an FDPS failure in Brussels ACC occurred on 19 July, there was also a terminal evacuation in Munich on the 28 July. Convective weather conditions (thunderstorms) also affected large areas of North Western Europe throughout the summer season.

Towards the end of the year cancellations rates returned to more standard levels, with only industrial action in France on 14 December causing disruption.

9   Scheduling Indicators

Scheduling correctly is a difficult art: if too long a time is blocked for a flight, the airline will not be able to make best use of resources - staff, airframes, infrastructure. Too short a time can arguably be worse as late flights generate rotational delay with late incoming aircraft and passengers from previous flights having to be accommodated. When flights leave on time but arrive after the scheduled time of arrival they cause reactionary delays. Schedule padding is essential for air carriers in order to find schedules which work with the typical patterns of delay, so that they can deliver passengers on time, and get maximum use out of their aircraft. Consequently, when delays decrease it takes one or two (IATA) seasons for the airline to adapt its schedule accordingly.

Two CODA scheduling indicators help airline schedulers determine the optimal schedule based on historical flight data:

The **Delay Difference Indicator - Flight (DDI-F)** or the difference between departure and arrival punctuality expressed in minutes. This can be indicated as a positive or negative figure, for example, a flight departing with 20 minutes delay and arriving with 30 minutes arrival delay will have a DDI-F of +10 minutes. The European DDI-F in 2018 was -4.2 minutes, this was stable in comparison to 2017 where the DDI-F was also -4.2 indicating no increases of schedule buffering per flight when compared to 2017.

The **Block Time Overshoot (BTO)** is the percentage of flights with an actual block time which exceeds the scheduled block time. The European BTO in 2018 remained stable at 28% compared to 27% in 2017.

Figure 17. Block Time Overshoot (BTO) and Delay Difference Indicator - Flight (DDI-F) 2018
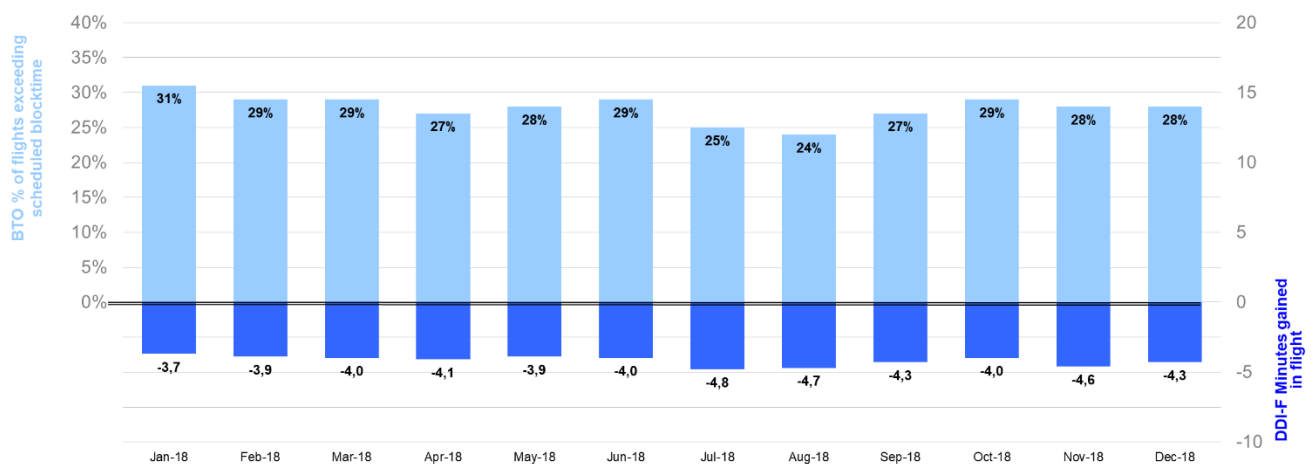
10 Reactionary Delay Analysis

In 2018 the share of reactionary delay (IATA delay codes 91-96) was 45% of delay minutes contributing 6.7 minutes per flight. Reactionary delays are generated as a result of an aircraft's late arrival from a previous flight which in turn affects the punctuality of its next flight with the same aircraft, as well as potentially delaying connecting passengers. See IATA Standard Delay Codes section for an overview of the IATA reactionary delay codes. Subsequently there are two types of reactionary delays: firstly as a result of the same aircraft being delayed on its next flight (rotational delay) and secondly when another aircraft is delayed as a result of another aircraft typically through passengers, crew and load connection (non-rotational delays).

This section concentrates on IATA delay code 93 rotational delays, as these have a significant share of overall reactionary delays (approximately 90%) and the largest effect on network performance and passenger experience.

In Figure 18 analysis shows that the median number of scheduled flights per sequence for an aircraft in 2018 was 5, up from 4 during 2017. The first and third quartile also increased compared to 2017. A sequence combines flights operated by the same aircraft with a normal planned ground time between flights. A sequence will end when the aircraft remains on the ground for a longer time compared to a normal turn-around time, e.g. night stop, maintenance slots etc. An increase in the scheduled sequence depth may also drive an increase in reactionary delays.

Figure 18. Median Scheduled Flight Sequence Depth and Share of Reactionary Departure Delay on Intra European Flights: 2017 –2018.
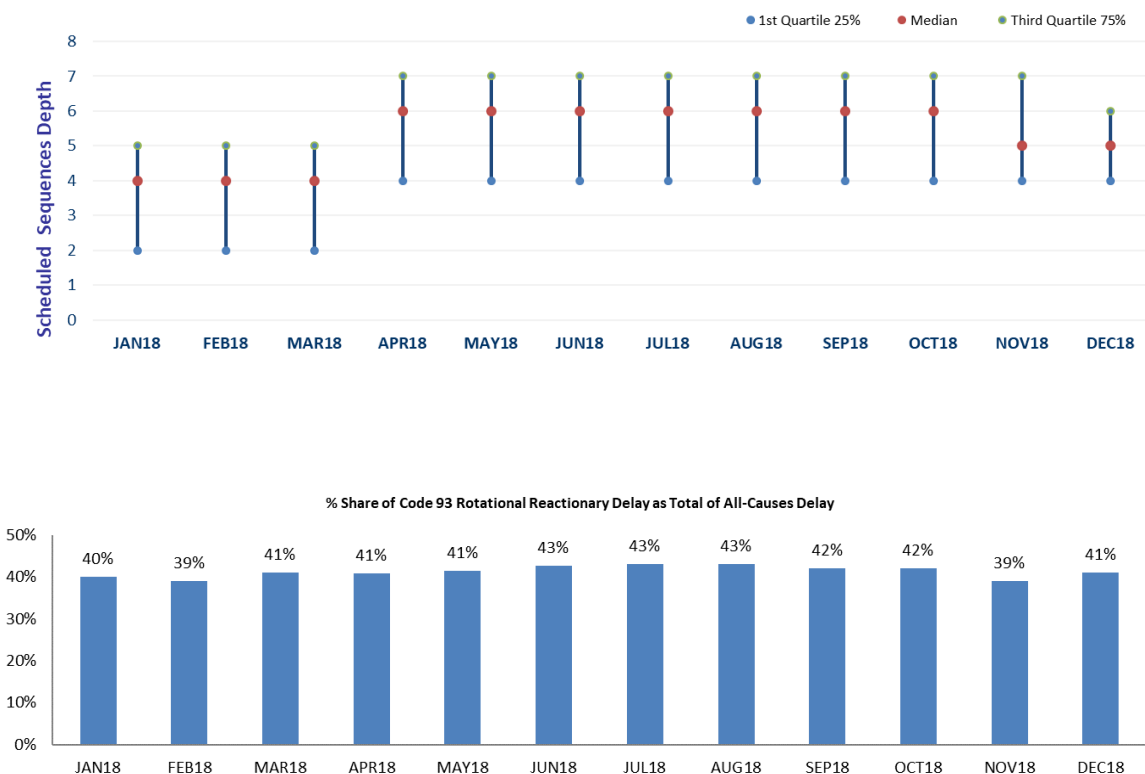
11   Average Departure Delay per Flight by Hour

Figure 19. Breakdown of the Average Departure Delay per Flight by Hour of the Day 2017 (top) vs. 2018 (bottom)

2017: Shares of all-cause delay reported by airlines, by hour of the day
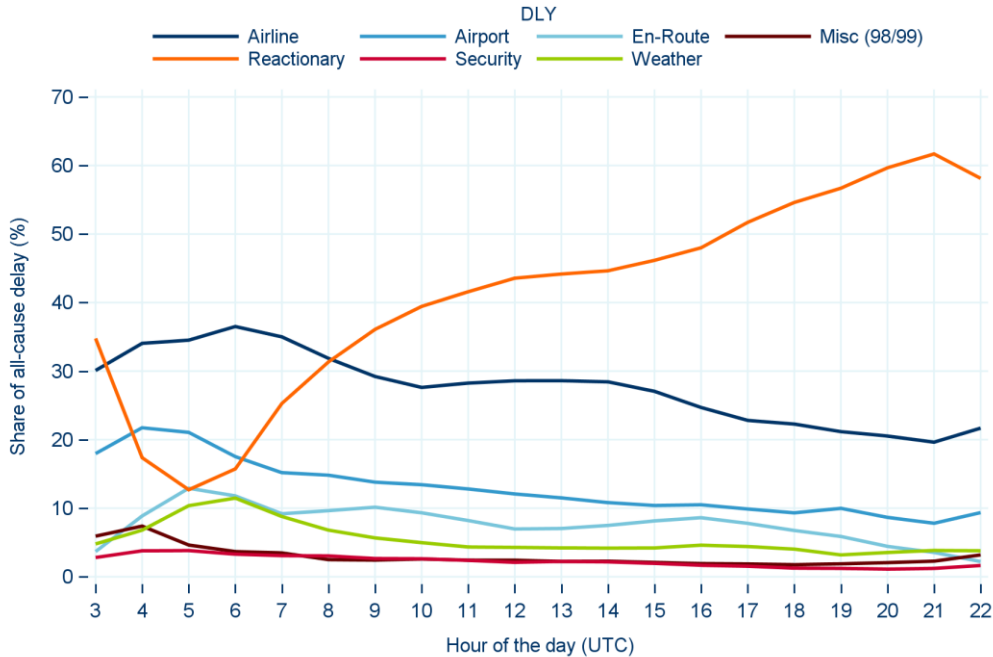
Based on CODA sample of 70.1% of commercial flights in the ECAC region in 2018   © EUROCONTROL 2019 www.eurocontrol.int/CODA

2018: Shares of all-cause delay reported by airlines, by hour of the day
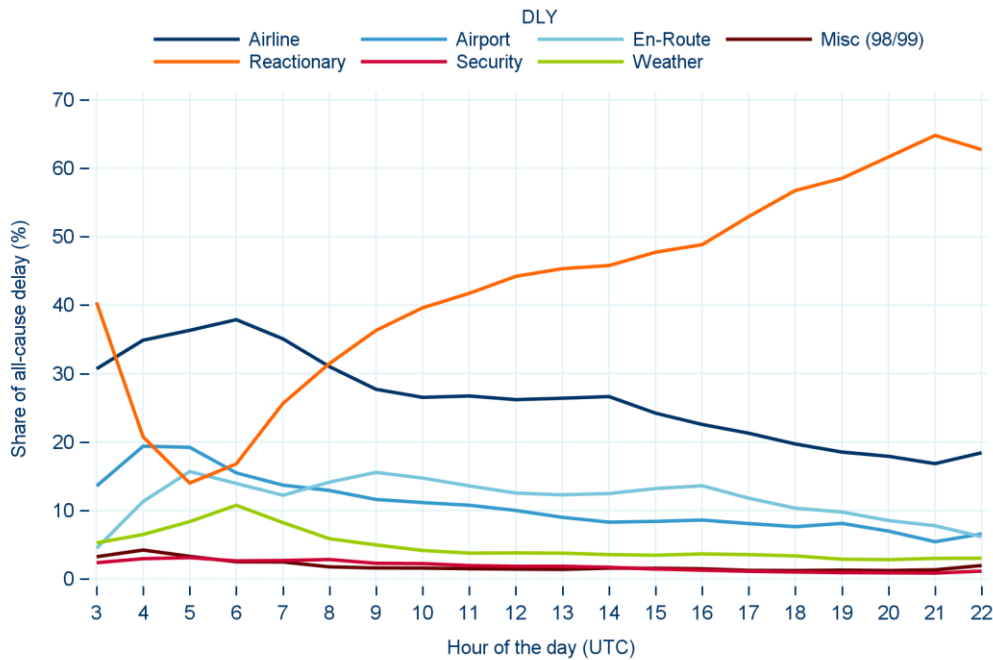
Based on CODA sample of 70.1% of commercial flights in the ECAC region in 2018   © EUROCONTROL 2019 www.eurocontrol.int/CODA

Figure 19 shows a higher share of en-route delay during the first rotation hours (between 0300 and 0900 UTC) when compared to 2017, peaking at 0900UTC and remaining high (above 10%) throughout the day. The peak share of airline delays was reached at 0600UTC, but remained similar to that of 2017. Reactionary delays showed a similar pattern compared to 2017 with the share exceeding 60% by 2000UTC during 2018.

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12 Average Delay per Delayed Flight vs Percentage of Delayed Flights

Figure 20. ADD vs. PDF on Departure
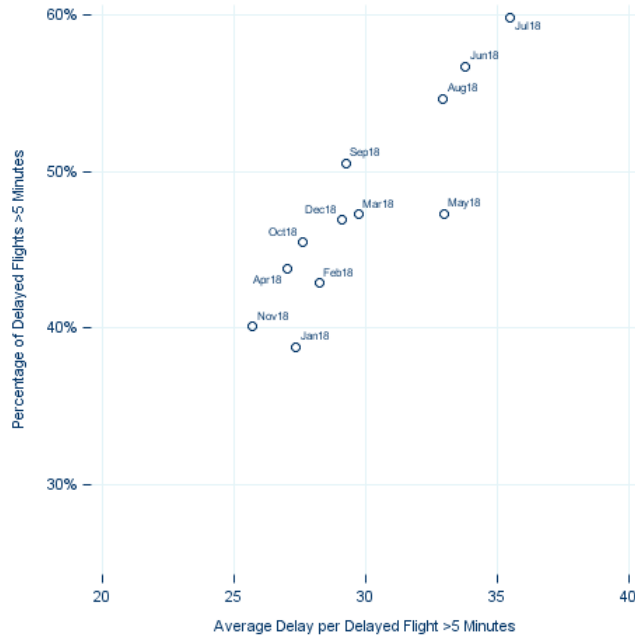
The notably poor performance in June, July and August can be observed in Figures 20 and Figure 21.

When grouped together in 2018 the percentage of flights delayed on departure (>=5 minutes) increased to 48.4%. The average delay per delayed (ADD) flight was 30.5 minutes, an increase of 2.5 minutes.

Figure 21. ADD vs. PDF on Arrival

The average delay per delayed flight on arrival from all-causes was 32.3 minutes per flight in 2018 an increase of 2.4 minutes per flight. The percentage of delayed arrivals also increased, this by 4.1 percentage points to 42.8% in comparison to 2017.

Use of schedule buffering can be observed as the percentage of delayed arrivals decreases, by comparing Figures 20 and 21, as the difference between the percentage of delayed arrivals and delayed departures in percentage points. In 2018 this increased year on year from 3.1 % points in 2014 to 5.6 % points in 2018.

13   Top 20 Delay Affected Departure Airports

Figure 22. All-Causes Delay. Top 20 Affected Departure Airports 2018

Rank	Departure airport	ICAO Code	Average delay per departure (mins)	Delay Change	Average delay per delayed departure	Percentage delayed departures	Average Reactionary Delay Per Departure (Mins)
1	LONDON STANSTED	EGSS	24.4	67%	36.0	67.7%	8.4
2	COLOGNE-BONN	EDDK	23.0	56%	39.3	58.4%	9.5
3	LISBON	LPPT	22.8	32%	33.3	68.6%	10.3
4	PALMA DE MALLORCA	LEPA	21.5	28%	39.4	54.5%	11.3
5	BARCELONA	LEBL	20.1	57%	36.7	54.6%	8.6
6	LONDON LUTON	EGGW	19.9	16%	32.1	62.1%	9.3
7	BRISTOL	EGGD	18.8	.	34.7	54.3%	7.1
8	TEL AVIV BEN GURION	LLBG	18.3	15%	31.8	57.6%	6.7
9	PORTO	LPPR	18.3	50%	36.2	50.5%	11.4
10	PRAGUE	LKPR	18.2	44%	32.6	55.8%	8.7
11	NICE	LFMN	17.7	25%	35.0	50.6%	9.0
12	BUDAPEST	LHBP	17.5	32%	31.2	55.9%	8.3
13	BRUSSELS NATIONAL	EBBR	17.4	23%	27.5	63.4%	6.4
14	LONDON GATWICK	EGKK	17.3	9%	32.7	52.8%	7.5
15	BIRMINGHAM	EGBB	17.2	13%	33.7	51.2%	7.5
16	MANCHESTER	EGCC	17.2	6%	31.5	54.6%	7.0
17	WARSAW	EPWA	17.2	.	30.3	56.6%	8.2
18	CATANIA	LICC	17.1	.	33.0	51.9%	9.8
19	PARIS CH DE GAULLE	LFPG	17.0	18%	29.0	58.7%	3.6
20	MILAN MALPENSA	LIMC	17.0	18%	33.7	50.3%	8.4

London Stansted ranked 1st in the top 20 affected airports with an average delay per departure of 24.4 minutes, flights departing from the airport suffering from en-route delay as well as airport delays. Cologne airport ranked 2nd with an average delay per flight of 23 minutes, with airlines also suffering en-route delays. Lisbon was affected with airport capacity delays during the year as well as en-route regulations. Airlines with flights departing from Palma de Mallorca suffered mostly from reactionary delay and en-route delays.

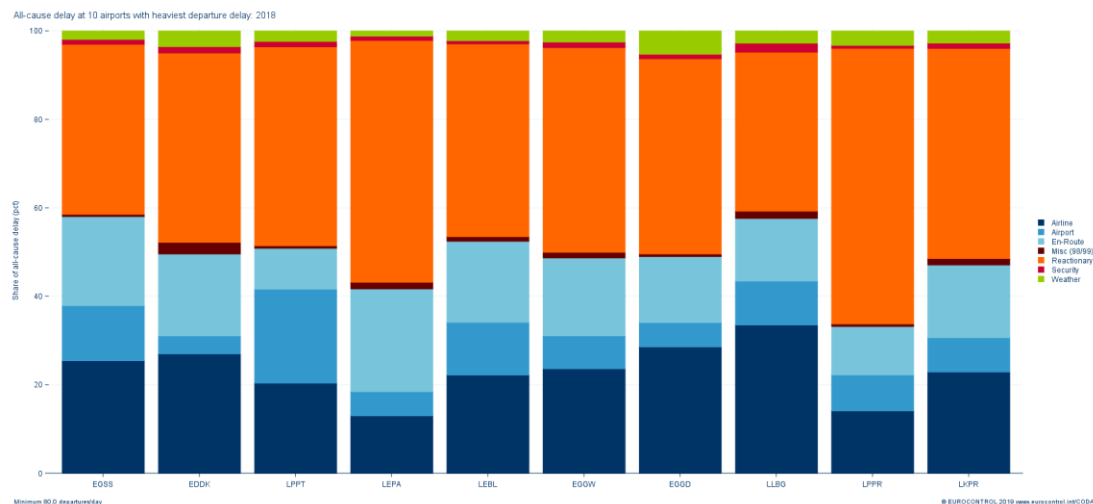**Figure 23. Main Delay Causes at the Top 10 Affected Departure Airports**

14 Top 20 Delay Affected Arrival Airports

Figure 24. All-Causes Delay. Top 20 Affected Arrival Airports 2018

Rank	Arrival airport	ICAO Code	Average delay per arrival (mins)	Delay Change	Average delay per delayed arrival	Percentage delayed arrivals	Average Reactionary Delay Per Arrival (Mins)
1	LONDON STANSTED	EGSS	22.9	56%	42.9	53.3%	13.6
2	BARCELONA	LEBL	21.4	68%	42.2	50.6%	11.7
3	COLOGNE-BONN	EDDK	21.4	54%	44.2	48.3%	12.8
4	LISBON	LPPT	20.9	31%	36.7	56.9%	11.6
5	BRISTOL	EGGD	20.8	22%	40.1	51.9%	12.0
6	LONDON GATWICK	EGKK	19.3	-10%	41.4	46.7%	10.9
7	PORTO	LPPR	19.1	52%	37.3	51.1%	10.0
8	LONDON LUTON	EGGW	18.5	23%	38.6	47.9%	12.2
9	TEL AVIV BEN GURION	LLBG	17.8	23%	32.5	54.8%	6.5
10	PALMA DE MALLORCA	LEPA	17.7	34%	38.6	45.7%	7.8
11	PRAGUE	LKPR	17.0	38%	35.3	48.2%	10.1
12	MANCHESTER	EGCC	16.7	4%	36.3	46.0%	9.3
13	BUDAPEST	LHBP	15.9	28%	32.3	49.3%	8.1
14	MILAN MALPENSA	LIMC	15.9	15%	35.5	44.7%	8.8
15	BIRMINGHAM	EGBB	15.9	14%	35.3	44.9%	8.9
16	BUCHAREST OTP-INTL.	LROP	15.3	24%	30.0	50.8%	8.1
17	DUBLIN	EIDW	15.2	38%	32.4	46.9%	8.4
18	MILAN BERGAMO	LIME	15.2	53%	36.0	42.3%	7.8
19	EDINBURGH	EGPH	14.9	19%	32.9	45.4%	9.5
20	BRUSSELS NATIONAL	EBBR	14.3	17%	31.1	45.8%	7.2

London Stansted ranked number one for arrival delays in 2018, with an average delay per flight on arrival of 22.9 minutes, with high reactionary delays as a result of first rotation en-route delays. Barcelona was affected by weather delays, mainly thunderstorms as well as en-route delays.

Figure 25. Main Delay Causes at the Top 10 Affected Arrival Airports
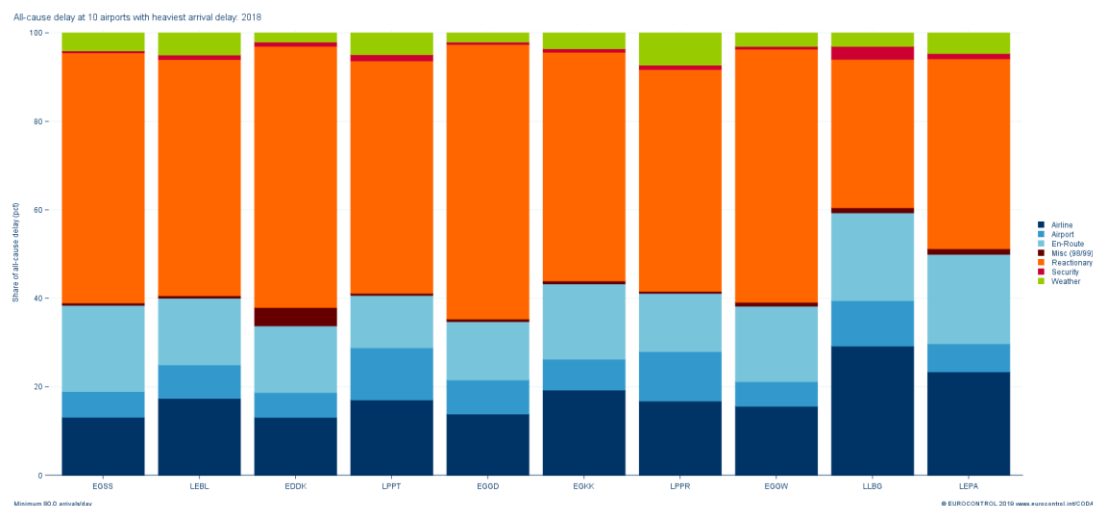
15   Top 20 Delay Affected Airport Pairs

Figure 26. All-Causes Delay Situation for the 20 Most Delayed Airport Pairs 2018

Rank	Departure Airport	Arrival Airport	Average Delay Per Departure	Change since Previous Period	Average Delay Per Delayed Departure	Percentage Delayed Departures
1	PALMA DE MALLORCA	COLOGNE-BONN	34.3	50%	50.8	67.6%
2	IBIZA	BARCELONA	29.1	83%	46.4	62.7%
3	COLOGNE -BONN	PALMA DE MALLORCA	28.8	51%	42.8	67.3%
4	PORTO	LISBON	28.3	103%	42.9	65.9%
5	ROME FIUMICINO	BARCELONA	27.8	59%	40.1	69.3%
6	LISBON	PORTO	27.3	104%	40.5	67.3%
7	LISBON	BARCELONA	26.7	58%	37.9	70.5%
8	LONDON GATWICK	BARCELONA	26.5	38%	41.6	63.7%
9	AMSTERDAM SCHIPHOL	BARCELONA	26.3	37%	38.7	67.9%
10	BARCELONA	LISBON	25.7	45%	39.2	65.6%
11	PARIS ORLY	BARCELONA	25.2	64%	41.2	61.1%
12	BARCELONA	LONDON GATWICK	24.8	51%	42.0	59.1%
13	LONDON STANSTED	DUBLIN	23.9	78%	36.5	65.6%
14	LISBON	MADEIRA	23.7	51%	34.8	68.0%
15	DUBLIN	LONDON STANSTED	23.3	85%	38.1	61.0%
16	BARCELONA	BRUSSELS NATIONAL	23.2	38%	36.6	63.3%
17	BARCELONA	IBIZA	22.8	120%	39.7	57.4%
18	BARCELONA	AMSTERDAM SCHIPHOL	22.7	34%	34.9	65.0%
19	PARIS CH DE GAULLE	BARCELONA	22.5	29%	35.8	63.0%
20	AMSTERDAM SCHIPHOL	LONDON LUTON	22.5	5%	39.0	57.7%

Flights between Palma de Mallorca and Cologne-Bonn ranked highest in the most delayed airport pairs, with flights on this route suffering from en-route capacity delays, with significant delays being observed during the summer season. Elsewhere in the network en-route and weather delays impacted flights in and out of Barcelona, with this airport appearing in 10 of the 20 most delayed pairs. Flights between Lisbon and Porto also experienced delays as Lisbon airport suffered from capacity delays.

16   Year on Year Trends in All-Causes Indicators

This section summarises the year-on-year trends in the main indicators of delay from all-causes. A flight is considered delayed from 5 minutes.

Further references to these graphs can be found in departure and arrival sections (sections 6 & 7) of this report. The below graphs are based on CODA data covering 70% of commercial flights in the ECAC region in 2018.

Figure 27 Average all-causes delay delayed flight (departures top, arrivals bottom)
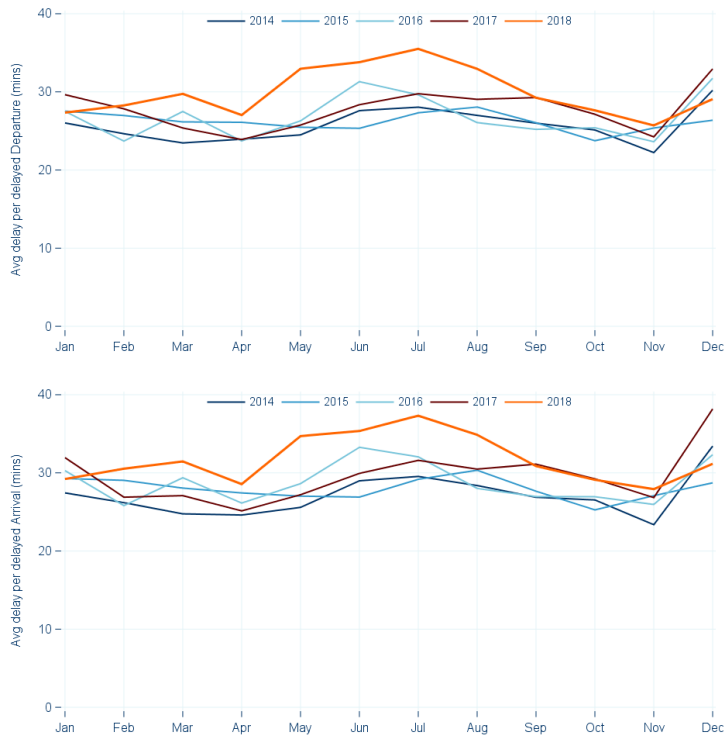
Figure 28. Percentage of flights delayed for all-causes delay (departures top, arrivals bottom)
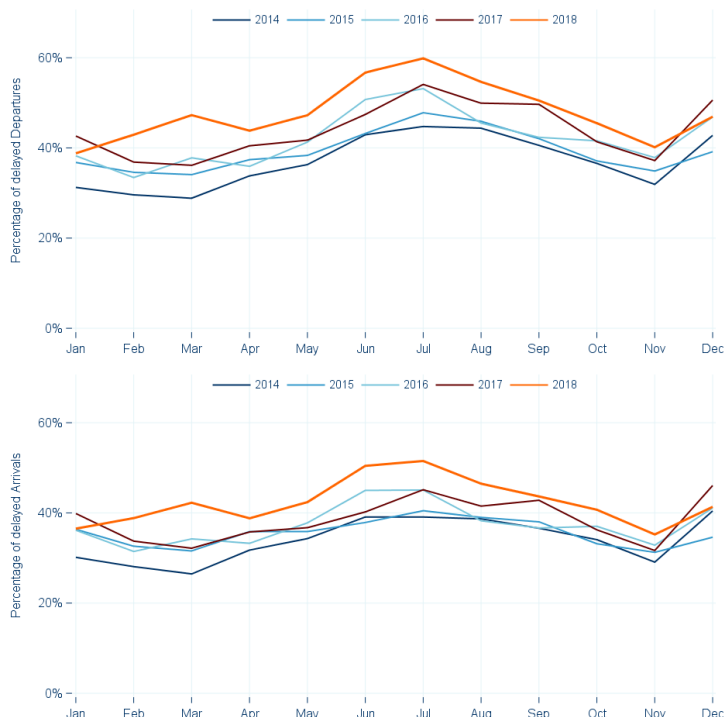
Figure 29. Percentage of flights delayed >15mins for all-causes (departures top, arrivals bottom)

17   CODA Delay Groupings

	CODA CAUSE	Description	IATA Code
Primary Delay Causes	**Airline**	Passenger and Baggage	11-19
		Cargo and Mail	21-29
		Aircraft and Ramp Handling	31-39
		Technical and Aircraft Equipment	41-48
		Damage to Aircraft & EDP Automated Equipment Failure	51-58
		Flight Operations and Crewing	61-69
		Other Airline Related Causes	Others
	Airport	ATFM due to Restriction at Destination Airport	83
		Airport Facilities	87
		Restrictions at Airport of Destination	88
		Restrictions at Airport of Departure	89
	En-Route	ATFM due to ATC En-Route Demand Capacity	81
		ATFM due to ATC Staff Equipment En-Route	82
	Governmental	Security and Immigration	85-86
	Weather	Weather (other than ATFM)	71-77
		ATFM due to Weather at Destination	84
	Miscellaneous	Miscellaneous	98-99
	Reactionary	Late Arrival of Aircraft, Crew, Passengers or Load	91-96

18 Correlation between IATA Delay Codes and the NM Regulation Codes

Note: updated version published in the ATFCM Users Manual 20.1.1[1]

Correlation Between IATA Delay Codes and NM Regulation Reasons (Edition 20.1.1)

Regulation Cause	Code	Regulation Location	NM Guidelines	IATA Code	IATA Delay Cause
ATC Capacity	C	D	En Route: Demand exceeds or complexity reduces declared or expected ATC capacity. Airport: Demand exceeds declared or expected ATC capacity	89	RESTRICTIONS AT AIRPORT OF DEPARTURE
		E		81	ATFM due to ATC ENROUTE DEMAND/CAPACITY
		A		83	ATFM due to RESTRICTION AT DESTINATION AIRPORT
ATC Industrial Action	I	D		89	RESTRICTIONS AT AIRPORT OF DEPARTURE
		E	Reduction in any capacity due to industrial action by ATC staff	82	ATFM due to ATC STAFF/EQUIPMENT ENROUTE
		A		83	ATFM due to RESTRICTION AT DESTINATION AIRPORT
ATC Routeings	R	D	Network Solutions / Scenarios used to balance demand and capacity	81	ATFM due to ATC ENROUTE DEMAND/CAPACITY
ATC Staffing	S	D		89	RESTRICTIONS AT AIRPORT OF DEPARTURE
		E	Unplanned staff shortage reducing expected capacity	82	ATFM due to ATC STAFF/EQUIPMENT ENROUTE
		A		83	ATFM due to RESTRICTION AT DESTINATION AIRPORT
ATC Equipment	T	D		89	RESTRICTIONS AT AIRPORT OF DEPARTURE
		E	Reduction of expected of declared capacity due to the non-availability or degradation of equipment used to provide an ATC service	82	ATFM due to ATC STAFF/EQUIPMENT ENROUTE
		A		83	ATFM due to RESTRICTION AT DESTINATION AIRPORT
Accident/Incident	A	D		89	RESTRICTIONS AT AIRPORT OF DEPARTURE
		A	Reduction of expected ATC capacity due to an aircraft accident/incident	83	ATFM due to RESTRICTION AT DESTINATION AIRPORT
Aerodrome Capacity	G	D	Reduction in declared or expected capacity due to the degradation or non-availability of infrastructure at an airport e.g. work in progress, shortage of aircraft stands etc. Or when demand exeeds expected aerodrome capacity.	89	RESTRICTIONS AT AIRPORT OF DEPARTURE
		A		83	ATFM due to RESTRICTION AT DESTINATION AIRPORT
Aerodrome Services	E	D	Reduced capacity due to the degradation or non-availability of support equipment at an airport e.g. Fire Service, De-Icing / Snow Removal equipment or toher ground handling equipment	99	OTHER
		A		99	OTHER
Industrial Action NON-ATC	N	D	A reduction in expected / planned capacity due to industrial action by non-ATC personnel	98	INDUSTRIAL ACTION OUTSIDE OWN AIRLINE
		A		98	INDUSTRIAL ACTION OUTSIDE OWN AIRLINE
Airspace Management	M	D		89	RESTRICTIONS AT AIRPORT OF DEPARTURE
		E	Reduction in delared or expected capacity following changes in airspace / route availability due to small scale military activity	82	ATFM due to ATC STAFF/EQUIPMENT ENROUTE
		A		83	ATFM due to RESTRICTION AT DESTINATION AIRPORT
Special Event	P	D	Reduction in planned, declared or expected capacity or when demand exceeds the above capacities as a result of a major sporting, governmental or social event. It may also be sued for ATM system upgrades and transitions. Large multinational exercises may also use this reason.	89	RESTRICTIONS AT AIRPORT OF DEPARTURE
		E		82	ATFM due to ATC STAFF/EQUIPMENT ENROUTE
		A	This category should only be used with prior approval during the planning process	83	ATFM due to RESTRICTION AT DESTINATION AIRPORT
Weather	W	D	Reduction in expected capacity due to any weather phenomena. This includes were weather impacts airport infrastructure capacity, but where aerodrome services are operating as planned / expected	89	RESTRICTIONS AT AIRPORT OF DEPARTURE
		E		81	ATFM due to ATC ENROUTE DEMAND/CAPACITY
		A		84	ATFM due to WEATHER AT DESTINATION
Environmental issue	V	D	Reduction in any capacity or when demand exceeds capacity due to agreed local noise, runway or similar procedures. This category should only be used with prior agreement in the planning process.	89	RESTRICTIONS AT AIRPORT OF DEPARTURE
		E		81	ATFM due to ATC ENROUTE DEMAND/CAPACITY
		A		83	ATFM due to RESTRICTION AT DESTINATION AIRPORT
Other	O	D	This category should be used in exceptional circumstances when no other category is sufficient.	89	RESTRICTIONS AT AIRPORT OF DEPARTURE
		E	An explanatory ANM remark MUST be given to allow post ops analysis	81	ATFM due to ATC ENROUTE DEMAND/CAPACITY
		A		83	ATFM due to RESTRICTION AT DESTINATION AIRPORT

[1] http://www.eurocontrol.int/sites/default/files/content/documents/nm/network-operations/HANDBOOK/atfcm-users-manual-current.pdf

19   Standard IATA Delay Codes (AHM 730)

Others

00-05	AIRLINE INTERNAL CODES
06 (OA)	NO GATE STAND AVAILABILITY DUE TO OWN AIRLINE ACTIVITY Including Early Arrivals
09 (SG)	SCHEDULED GROUND TIME LESS THAN DECLARED MINIMUM GROUND TIME

Passenger and Baggage

11 (PD)	LATE CHECK-IN, acceptance after deadline
12 (PL)	LATE CHECK-IN, congestions in check-in area
13 (PE)	CHECK-IN ERROR, passenger and baggage
14 (PO)	OVERSALES, booking errors
15 (PH)	BOARDING, discrepancies and paging, missing checked-in passenger
16 (PS)	COMMERCIAL PUBLICITY PASSENGER CONVENIENCE, VIP, press, ground meals and missing personal items
17 (PC)	CATERING ORDER, late or incorrect order given to supplier
18 (PB)	BAGGAGE PROCESSING, sorting etc.
19 (PW)	REDUCED MOBILITY, boarding deboarding of passengers with reduced mobility.

Cargo and Mail

21 (CD)	DOCUMENTATION, errors etc.
22 (CP)	LATE POSITIONING
23 (CC)	LATE ACCEPTANCE
24 (CI)	INADEQUATE PACKING
25 (CO)	OVERSALES, booking errors
26 (CU)	LATE PREPARATION IN WAREHOUSE
27 (CE)	DOCUMENTATION, PACKING etc *(Mail Only)*
28 (CL)	LATE POSITIONING *(Mail Only)*
29 (CA)	LATE ACCEPTANCE *(Mail Only)*

Aircraft and Ramp Handling

31 (GD)	AIRCRAFT DOCUMENTATION LATE INACCURATE, weight and balance, general declaration, pax manifest, etc.
32 (GL)	LOADING UNLOADING, bulky, special load, cabin load, lack of loading staff
33 (GE)	LOADING EQUIPMENT, lack of or breakdown, e.g. container pallet loader, lack of staff
34 (GS)	SERVICING EQUIPMENT, lack of or breakdown, lack of staff, e.g. steps
35 (GC)	AIRCRAFT CLEANING
36 (GF)	FUELLING DEFUELLING, fuel supplier
37 (GB)	CATERING, late delivery or loading
38 (GU)	ULD, lack of or serviceability
39 (GT)	TECHNICAL EQUIPMENT, lack of or breakdown, lack of staff, e.g. pushback

Technical and Aircraft Equipment

41 (TD)	AIRCRAFT DEFECTS.
42 (TM)	SCHEDULED MAINTENANCE, late release.
43 (TN)	NON-SCHEDULED MAINTENANCE, special checks and or additional works beyond normal maintenance schedule.
44 (TS)	SPARES AND MAINTENANCE EQUIPMENT, lack of or breakdown.
45 (TA)	AOG SPARES, to be carried to another station.
46 (TC)	AIRCRAFT CHANGE, for technical reasons.
47 (TL)	STAND-BY AIRCRAFT, lack of planned stand-by aircraft for technical reasons.
48 (TV)	SCHEDULED CABIN CONFIGURATION VERSION ADJUSTMENTS.

Damage to Aircraft & EDP Automated Equipment Failure

51 (DF)	DAMAGE DURING FLIGHT OPERATIONS, bird or lightning strike, turbulence, heavy or overweight landing, collision during taxiing
52 (DG)	DAMAGE DURING GROUND OPERATIONS, collisions (other than during taxiing), loading off-loading damage, contamination, towing, extreme weather conditions
55 (ED)	DEPARTURE CONTROL
56 (EC)	CARGO PREPARATION DOCUMENTATION
57 (EF)	FLIGHT PLANS
58 (EO)	OTHER AUTOMATED SYSTEM

Flight Operations and Crewing

61 (FP)	FLIGHT PLAN, late completion or change of, flight documentation
62 (FF)	OPERATIONAL REQUIREMENTS, fuel, load alteration

63 (FT)   LATE CREW BOARDING OR DEPARTURE PROCEDURES, other than connection and standby (flight deck or entire crew)

64 (FS)   FLIGHT DECK CREW SHORTAGE, sickness, awaiting standby, flight time limitations, crew meals, valid visa, health documents, etc.

65 (FR)   FLIGHT DECK CREW SPECIAL REQUEST, not within operational requirements

66 (FL)   LATE CABIN CREW BOARDING OR DEPARTURE PROCEDURES, other than connection and standby

67 (FC)   CABIN CREW SHORTAGE, sickness, awaiting standby, flight time limitations, crew meals, valid visa, health documents, etc.

68 (FA)   CABIN CREW ERROR OR SPECIAL REQUEST, not within operational requirements

69 (FB)   CAPTAIN REQUEST FOR SECURITY CHECK, extraordinary

Weather

71 (WO)   DEPARTURE STATION

72 (WT)   DESTINATION STATION

73 (WR)   EN ROUTE OR ALTERNATE

75 (WI)   DE-ICING OF AIRCRAFT, removal of ice and or snow, frost prevention excluding unserviceability of equipment

76 (WS)   REMOVAL OF SNOW, ICE, WATER AND SAND FROM AIRPORT

77 (WG)   GROUND HANDLING IMPAIRED BY ADVERSE WEATHER CONDITIONS

Air Traffic Flow Management Restrictions

81 (AT)   ATFM due to ATC EN-ROUTE DEMAND CAPACITY, standard demand capacity problems

82 (AX)   ATFM due to ATC STAFF EQUIPMENT EN-ROUTE, reduced capacity caused by industrial action or staff shortage, equipment failure, military exercise or extraordinary demand due to capacity reduction in neighbouring area

83 (AE)   ATFM due to RESTRICTION AT DESTINATION AIRPORT, airport and or runway closed due to obstruction, industrial action, staff shortage, political unrest, noise abatement, night curfew, special flights

84 (AW)   ATFM due to WEATHER AT DESTINATION

Airport and Government Authorities

85 (AS)   MANDATORY SECURITY

86 (AG)   IMMIGRATION, CUSTOMS, HEALTH

87 (AF)   AIRPORT FACILITIES, parking stands, ramp congestion, lighting, buildings, gate limitations, etc.

88 (AD)   RESTRICTIONS AT AIRPORT OF DESTINATION, airport and or runway closed due to obstruction, industrial action, staff shortage, political unrest, noise abatement, night curfew, special flights

89 (AM)   RESTRICTIONS AT AIRPORT OF DEPARTURE WITH OR WITHOUT ATFM RESTRICTIONS, including Air Traffic Services, start-up and pushback, airport and or runway closed due to obstruction or weather[2], industrial action, staff shortage, political unrest, noise abatement, night curfew, special flights

Reactionary

91 (RL)   LOAD CONNECTION, awaiting load from another flight

92 (RT)   THROUGH CHECK-IN ERROR, passenger and baggage

93 (RA)   AIRCRAFT ROTATION, late arrival of aircraft from another flight or previous sector

94 (RS)   CABIN CREW ROTATION, awaiting cabin crew from another flight

95 (RC)   CREW ROTATION, awaiting crew from another flight (flight deck or entire crew)

96 (RO)   OPERATIONS CONTROL, re-routing, diversion, consolidation, aircraft change for reasons other than technical

Miscellaneous

97 (MI)   INDUSTRIAL ACTION WITH OWN AIRLINE

98 (MO)   INDUSTRIAL ACTION OUTSIDE OWN AIRLINE, excluding ATS

99 (MX)   OTHER REASON, not matching any code above

SOURCE: IATA – Airport Handling Manual (730 & 731)

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[2] Restriction due to weather in case of ATFM regulation only, else refer to code 71 (WO)
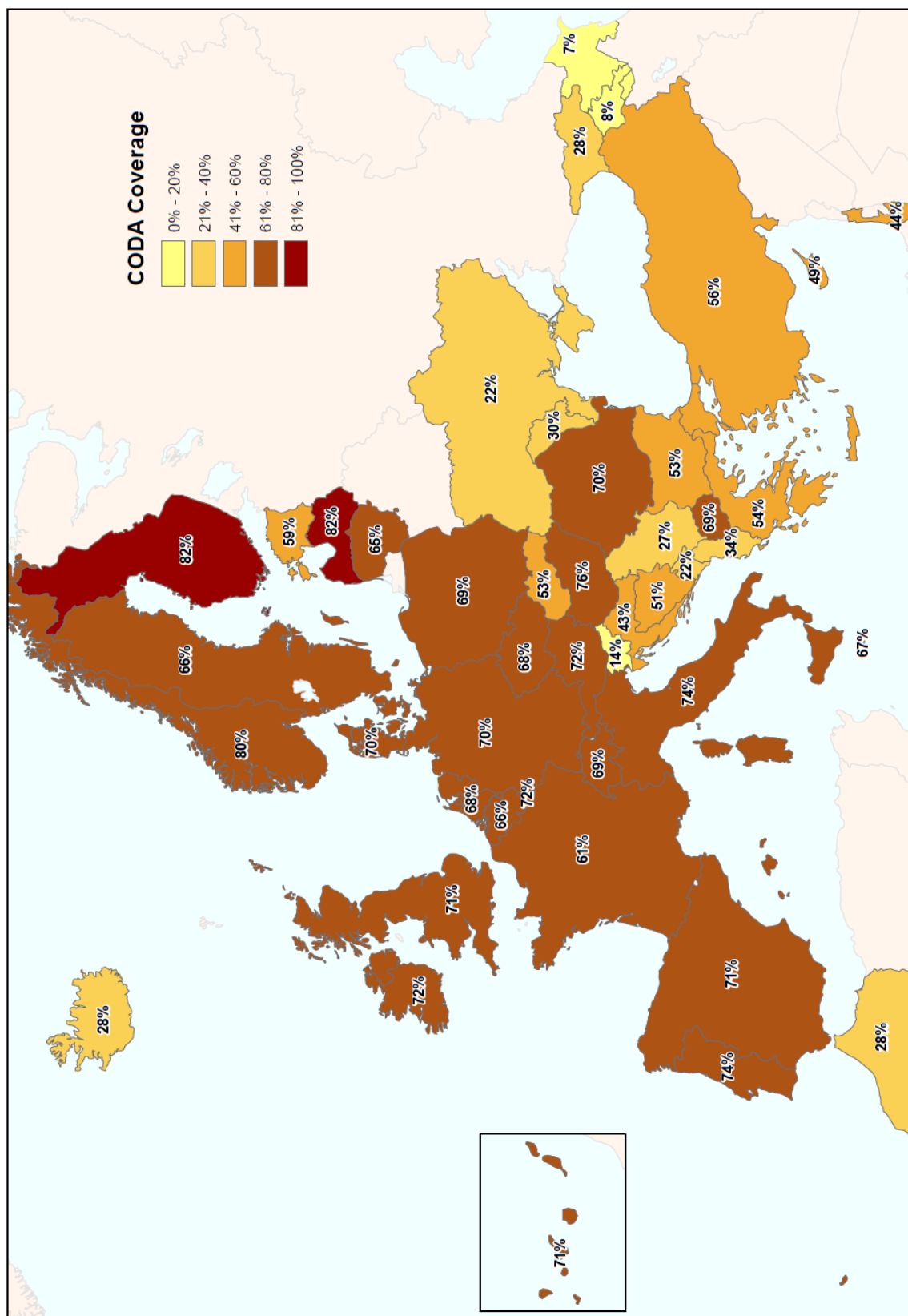
20   Standard IATA Delay Code Sub-Codes (AHM 731)

73 (WR)   **WEATHER: EN ROUTE OR ALTERNATE**
- **Z**   OUTSIDE AIRCRAFT LIMITS
- **Y**   OUTSIDE CREW LIMITS
- **X**   ETOPS

81 (AT)   **ATFM DUE TO ATC EN-ROUTE DEMAND CAPACITY, standard demand capacity problems**
- **Z**   ATC ROUTEING
- **Y**   HIGH DEMAND OR CAPACITY
- **X**   ENVIRONMENTAL
- **W**   WEATHER
- **G**   OTHER

82 (AX)   **ATFM DUE TO ATC STAFF EQUIPMENT EN-ROUTE, reduced capacity caused by industrial action or shortage or equipment failure, extraordinary demand due to capacity reduction in neighbouring area**
- **Z**   INDUSTRIAL ACTION
- **Y**   EQUIPMENT FAILURE
- **X**   STAFF SHORTAGE
- **W**   MILITARY ACTIVITY
- **V**   SPECIAL EVENT

83 (AE)   **ATFM DUE TO RESTRICTION AT DESTINATION AIRPORT, airport and or runway closed due to obstruction, industrial action, staff shortage, political unrest, noise abatement, night curfew, special flights**
- **Z**   HIGH DEMAND ATC CAPACITY
- **Y**   INDUSTRIAL ACTION
- **X**   EQUIPMENT FAILURE
- **W**   STAFF SHORTAGE
- **V**   ACCIDENT INCIDENT
- **U**   MILITARY ACTIVITY
- **T**   SPECIAL EVENT
- **S**   NOISE ABATEMENT NIGHT CURFEW
- **P**   HIGH DEMAND AIRPORT FACILTIES

85 (AS)   **MANDATORY SECURITY**
- **Z**   MANDATORY SECURITY CHECK
- **Y**   SECURITY CONTROL CHECKPOINTS
- **X**   BAGGAGE AVI SECURITY
- **W**   BAGGAGE IDENTIFICATION UNLOADING INTENDED
- **V**   AIRPORT TERMINAL SECURITY
- **U**   AIRLINE AIRCRAFT SECURITY CHECK
- **T**   EXTRAORDINARY SECURITY EVENTS
- **G**   OTHER

86 (AG)   **IMMIGRATION, CUSTOMS, HEALTH**
- **Z**   IMMIGRATION EMMIGRATION
- **Y**   CUSTOMS
- **X**   HEALTH
- **G**   OTHER

87 (AF)   **AIRPORT FACILITIES, parking stands, ramp congestion, lighting, buildings, gate limitations, etc.**
- **Z**   PARKING STANDS LIMITATION NO PARKING STANDS AVAILABLE, EXCLUDING EARLY ARRIVALS
- **Y**   RAMP CONGESTION, ABNORMAL STAND ACCESS LIMITATION (NON-ATC)
- **X**   BUILDINGS
- **W**   GATE LIMITATION NO GATE AVAILABLE EXCLUDING EARLY ARRIVALS
- **V**   BAGGAGE SORTING SYSTEM DOWN SLOW
- **U**   NO PUSH BACK CLEARANCE DUE TO INFRASTRUCTURE (NON-ATC)
- **T**   JET BRIDGE INOPERATIVE
- **S**   LACK OF CHECK IN COUNTERS
- **R**   AIRFIELD ELECTRICAL SYSTEM FAILURE
- **P**   PASSENGER TRANSPORT SYSTEM FAILURE
- **N**   PUBLIC ADDRESS FLIGHT INFORMATION DISPLAY SYSTEM FAILURE
- **M**   INSUFFICIENT FIRE COVER
- **J**   LATE POSITIONING OF AIRCRAFT (WHEN RESPONSIBILITY OF AIRPORT)
- **I**   SERVICE ROAD RESTRICTION
- **H**   LATE ARRIVAL OR LACK OF FOLLOW ME VEHICLE
- **G**   ANY OF THE ABOVE AT THE DESTINATION AIRPORT

89 (AM)   **RESTRICTIONS AT AIRPORT OF DEPARTURE WITH OR WITHOUT ATFM RESTRICTIONS, including Air Traffic Services, start-up and pushback, airport and or runway closed due to obstruction or weather.**

- **Z** ATC CAPACITY
- **Y** ATC INDUSTRIAL ACTION
- **X** ATC STAFFING
- **W** ATC EQUIPMENT
- **V** ATC ACCIDENT INCIDENT
- **U** MILITARY ACTIVITY SPECIAL FLIGHTS VIP
- **T** ATC SPECIAL EVENT
- **S** ATC WEATHER
- **O** ENVIRONMENTAL BENEFIT, DELAYED START-UP PUSHBACK DUE TO USE OF REDUCED STANDARD TAXI TIMES
- **R** ATC RESTRICTIONS DUE TO CURFEW
- **P** ATC POLITICAL UNREST
- **N** ATC ENVIRONMENTAL
- **M** AIRPORT CLOSURE
- **L** RUNWAY CLOSURE
- **K** MISCELLANEOUS START-UP DELAY (LOCAL ATC)
- **J** LOST FLIGHT PLAN BY ATC
- **I** LATE PUSHBACK GIVEN DUE TO OTHER REASONS THAN INFRASTRUCTURE
- **H** CONSTRUCTION WORK MAINTENENCE
- **G** OTHER

93 (RA)   **AIRCRAFT ROTATION, late arrival of aircraft from another flight**

- **Z** LATE ARRIVAL DUE DEPARTURE DELAY AT PREVIOUS STATION
- **Y** LATE ARRIVAL DUE ENROUTE DELAY
- **X** LATE ARRIVAL DUE DELAY AFTER LANDING
- **W** LATE ARRIVAL DUE TO HIGH DEMAND FOR DESTINATION STATION
- **V** LATE ARRIVAL DUE TO WEATHER AT DESTINATION
- **U** LATE ARRIVAL DUE TO TECHNICAL REASONS

21 Glossary of Terms and Abbreviations

ACC	Area Control Centre
ADD	Average Delay per Delayed Flight
AHM	Airport Handling Manual
AIBT	Actual In Block Time
AOBT	Actual Off Block Time
ATFCM	Air Traffic Flow and Capacity Management
ATFM	Air Traffic Flow Management (used by IATA in the Standard IATA Delay Codes)
ATS	Air Traffic Services
BTO	Block Time Overshoot
CODA	Central Office for Delay Analysis
DDI-F	Delay Difference Indicator – Flight
ECAC	European Civil Aviation Conference
FIR	Flight Information Region
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
NM	Network Manager
NMOC	Network Manager Operations Centre
PDF	Percentage of Delayed Flights
STA	Scheduled Time of Arrival
STD	Scheduled Time of Departure
TDF	Total Delayed Flights
TDM	Total Delay in Minutes
TTF	Total Flights

22   CODA Coverage of IFR Flights in 2018

EUROCONTROL Member States and Partner Countries

DOCUMENT FINAL PAGE