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PRB Monitoring Report 2019 and RP2 Overview

The 2019 monitoring consists of five reports:

- **PRB Monitoring Report 2019**
- Annex I – Union-wide detailed analysis for experts
- Annex II – Member States' detailed analysis for experts
- Annex III – Safety Report
- Annex IV – CAPEX Report

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Document Change Record

The following table records the complete history of the successive editions of the present documents.

Edition number	Edition date	Reason for change	Pages affected
1.0	29/10/2020	• First publication n/a	
2.0	01/12/2020	• 3rd cost-efficiency graph (% difference between actual and determined costs and service units by year) on page 55 (page 54 in edition 1.0) was replaced with a corrected version. Accompanying text was updated.	Page 55
		• 1st capacity graph (ATFM delay per flight) on page 59 (page 58 in edition 1.0) had the marking for the target corrected to show the FABEC capacity target.	Page 59
		• 1st safety graph (ANSP EoSM by year) on page 89 (page 88 in edition 1.0) was replaced with a corrected version.	Page 89

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Remarks from the Chair

Reporting about the activities of air traffic management in 2019 feels like a journey back in time: Demand for air travel was robust, the industry was growing and no one could have imagined how drastically and fast the world would change and how the COVID-19 pandemic would impact global aviation. Although aviation has had to weather many crises, none brought global aviation to a prolonged standstill as has COVID-19. Recovery is slow and painful, and at the time of writing of this report, European flights have come back to about half of the 2019 levels, while intercontinental travel remains at 10% of what it was a year ago.

The capacity issues and the environmental concerns, which dominated the assessment of the performance of air navigation service providers in 2018 and 2019 have given way to consideration of how the aviation industry can survive until there is a solution available to contain and eliminate COVID-19, and governments will ease or lift travel restrictions, allowing passengers to travel again across borders. Difficult years are ahead for the entire aviation sector and air navigation service providers will have to prepare for years with low demand. During the COVID-19 crisis, cargo flights continued to operate, and air navigation service providers managed to keep essential services running without major outbreaks in any of the area control centers, demonstrating that they are able to cope with the difficult operational situations. An equally difficult challenge lays ahead of them: Managing the financial consequences of the COVID-19 pandemic. They need to adapt their plans for the third reference period to a scenario with substantially less revenues impacting liquidity, investment and – most of all – the need to prepare and respond to the unexpected with flexibility and scalability.

In view of uncertainties and financial constraints, many of the issues air navigation service providers had during the past years will accentuate and repeating past mistakes will become more costly than during the times when aviation was growing and the pie was getting bigger. In view of the long lead times in the industry, decisions taken during this crisis must be contrasted against their long-term impact.

This PRB Monitoring Report enables stakeholders to identify the strengths and weaknesses of the performance of European air traffic management looking not only at the performance during 2019 but also during the second reference period. In the coming months, Member States will start to discuss the Commission's proposal to revise the Single European Sky legal basis (SES II+). This will be an important opportunity to integrate learnings from the past, ensuring that air traffic management contributes in the best way to the recovery of European aviation from this historic crisis.

On behalf of the PRB and its Support Team, I would like to thank EUROCONTROL, EASA and the European Commission for the excellent cooperation preparing this report.

Regula Dettling-Ott
PRB Chair

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Executive Summary

2019 will go down in history as the last year before the COVID-19 crisis when the aviation industry continued to grow, more people than ever before took a plane and when most airlines made solid or record profits.

Air navigation service providers delivered air traffic management at the forecasted cost but as in 2018 - because of a few failing area control centres in the core of Europe - the network suffered high delays. Airspace users had to bear the substantial cost of these delays. Emergency measures implemented by the Network Manager deviated traffic away from underperforming centres, which helped mitigate the delays. Together with measures airspace users and airports had taken, the chaotic delay situations of summer 2018 with millions of passengers affected were reduced.

Member States and airspace users also failed to meet the environmental targets during the second reference period with aircraft flying longer distances, although the targets had factored in the extension of routes due to weather and availability of airspace.

In summary, the monitoring of 2019 and the second reference period shows the following:

Traffic levels and forecast

The number of aircraft movements in European airspace remained stable during the past 12 years. Traffic levels, in terms of the number of flights, at the end of the second reference period were only slightly higher than in 2008 (+6%) i.e. air navigation service providers did not handle significantly more movements. However, they obtained more revenues because their charges depend on the size (maximum take-off weight) of the aircraft and distances flown. These two factors increased because airspace users operated larger aircraft to serve more passengers and because they increased their global networks.

The forecast for the entire second reference period was accurate in terms of movements and conservative in terms of en route service units. The actual movements of instrumental flight rules flights was within the boundaries of the STATFOR forecast and only 1.7% above the baseline forecasts. The amount of service units per revenues in 2018 and 2019 was above the high forecast.

Despite the accurate forecasts of the number of movements in the Single European Sky, some Member States and their service providers were not able to adapt their planning to the forecast, which created increasing delays, although they had more revenues than planned. Some Member States planned using the low forecasts due to a lack of faith in the STATFOR forecasts and some also revised their performance plans due to the gap between planned and actuals.

Safety

Member States, air navigation service providers and airlines operated safely throughout the second reference period and in 2019. The European Union Aviation Safety Agency reported that there were no severe incidents and no fatal accidents caused by air traffic management. The indicators measured under the performance and charging scheme partially confirm this positive result. The Effectiveness of Safety Management in the authorities of Member States and within the air navigation service providers and the use of the Risk Analysis Tools have improved. But still, not all Member States and not all the service providers reached the maximum level or even reached the targets.

Environment

Environmental performance remained an issue throughout the reference period with many Member States not achieving their targets. Due to larger aircraft and more flights, the CO_2 output of European aviation continued to grow, despite higher fuel efficiency of the individual aircraft.

Air traffic management played a part in the increase because throughout the second reference period and in 2019, airspace users were flying longer routes than necessary even though many Member States implemented Free Route Airspace, allowing airlines to choose their preferred routing. There are several causes for this result: One seems to be that air navigation service providers did not offer the shortest routes to airspace users in Member States, which have not yet implemented Free Route Airspace. Where it is available, route restrictions imposed by air navigation service providers and available flight levels prevented maximum effectiveness. Other causes include airlines opting for longer routes to avoid delays and zones with higher charges. Contributing factors were the emergency measures the Network Manager agreed to with Member States in 2018 and 2019, deviating traffic away from underperforming area control centers that did not provide sufficient capacity in the core of Europe.

Although the current historically low traffic levels render some of these concerns moot, the European Green Deal, which is a priority of the European Union will require all stakeholders to improve the environmental performance of air traffic management.

Capacity

During the second reference period and in 2019, traffic was within the STATFOR forecasted range (and historically similar to the level of traffic ten years ago). Nevertheless, many Member States missed the capacity targets by far and airspace users had to bear the costs of delay. The reason for this unsatisfactory result is insufficient long-term structural planning by air navigation service providers and a lack of cross-border cooperation – i.e. not putting capacity where needed. Lack of financial resources was not a cause since many air navigation service providers received higher revenues than planned. They had enough money but have omitted to add capacity.

The second reference period and 2019 also show important learnings with respect to the number of air traffic controllers on duty and their productivity. Delays are not only depending on traffic, but on other factors such as rostering and productivity: In September 2019, some air navigation service providers managed the same number of flights with much lower delays than two months before, during summer vacation in June/July 2019. Some air navigation service providers urgently need to improve their rostering including planning of vacations of controllers. Aviation is a 24/7 business for all stakeholders.

Cost-efficiency

During the second reference period and in 2019, air navigation service providers were mostly able to control their costs. Some of them even put too much emphasis on cost savings, namely halting training of new air traffic controllers. In 2019, costs were above the planned values contrary to all preceding years of the second reference period, where actual costs were below the planned values.

Again, as in previous years, air navigation service providers did not bear the financial cost of delays: they remained within the airspace users, amounting to 1.7B€.

Certain cost items of air navigation service providers were an issue in 2019, as in previous years:

- Some air navigation service providers accumulated substantial surpluses during the reference period, which they do not have to return to airspace users. In view of the COVID-19 crisis, the PRB expects that those who accumulated surpluses will use the money to manage the liquidity gap in 2020 and 2021 and to reduce their cost during the crisis;
- Several air navigation service providers spent as planned only in the last year of the reference period. This may indicate that the additional spending helped to increase the baseline for the planning of cost during the third reference period;
- Staff cost remain the highest cost item on the balance sheet of air navigation service providers. There is still not sufficient data to monitor how staff cost correlate with productivity.

Outlook

The structural issues, which have affected air traffic management in the past years will not go away just because flying is temporarily at historically low levels. On the contrary: Many of the issues that have hampered European air traffic management in 2019 and during the entire reference period will manifest themselves more forcefully during the slow and painful recovery from the COVID-19 pandemic. The absence of a shared vision on how to deal with the crisis and the lack of flexibility in service provision will result in higher costs than necessary, because capacity cannot be offered where needed. Missing environmental targets may have new consequences because many governments have conditioned state aid for airlines and air navigation service providers to compliance with environmental objectives.

Air navigation services providers will need to adjust to the new reality and towards revised performance targets by developing roadmaps to adapt their businesses in size and complexity, whilst gaining the buy-in from stakeholders and social partner and ensuring sufficient revenues for essential air traffic management services. The ATM Master Plan should provide the necessary guidance to achieve this, whilst avoiding a sudden increase in charges to airspace users at times of limited levels of traffic.

Many airlines have received public funds to survive the current crisis. In many cases, air navigation service providers also need solutions to bridge the liquidity shortage and financing gaps during the crisis. There is considerable pressure on all stakeholders on how they spend taxpayers' money.

The European Commission and the Member States will have to urgently adapt the planning of the third reference period, which started in 2020 and lasts until 2024, i.e. it will be impacted by the COVID-19 pandemic until its end. Learnings from the second reference period and 2019 will be important to safeguard the performance of European air traffic management during the unprecedented crisis.

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1 About the document

1 The PRB Monitoring Report 2019 provides analysis of the performance achieved by Member States of the Single European Sky (SES), covering the fifth and final year (2019) of the second reference period (RP2).

2 The PRB Monitoring Report 2019 is supported by four Annexes to provide a detailed analysis of performance:

- Annex I – Union-wide detailed analysis for experts
- Annex II – Member States' detailed analysis for experts
- Annex III – Safety Report
- Annex IV – CAPEX Report

3 Monitoring is one of the primary tasks of the Performance Review Body, ensuring that Member States, the European Commission and stakeholders are informed about how air navigation service providers (ANSPs) perform in relation to performance targets.

4 The PRB Monitoring Report 2019 used data provided and verified by the Member States, the Performance Review Unit of Eurocontrol (PRU), the Network Manager (NM) and the European Aviation Safety Agency (EASA).

5 The Monitoring Report contains the most important results without technical detail. The detailed analysis including the analysis per Member State is in Annexes I-IV. The Member State factsheets are published in a new format providing readers with a snapshot of local performance in each Key Performance Area and include PRB comments.

2 Facts and figures from 2019

2.1 En route traffic continued to grow but the pace of growth slowed during the past five years

6 The number of flights operated under instrument flight rules (IFR) within Single European Sky (SES) airspace continued to grow in 2019 and increased by 1.16% (see Figure 1). This growth is less than in the previous years (2015 to 2018) during which traffic increased at a compounded annual growth rate of 2.53% per year.

7 The actual traffic confirms that the STATFOR 2014 base forecast was accurate: at Union-wide level, the actual flights remained within the high and low boundaries and close to the base forecast. In 2019, Romania and Bulgaria (DANUBE FAB) and Spain and Portugal (SW FAB) were the only Functional Airspace Blocks (FABs) where the actual traffic was outside of the range of the forecasts.

Increase of actual traffic during RP2 and comparison with forecast

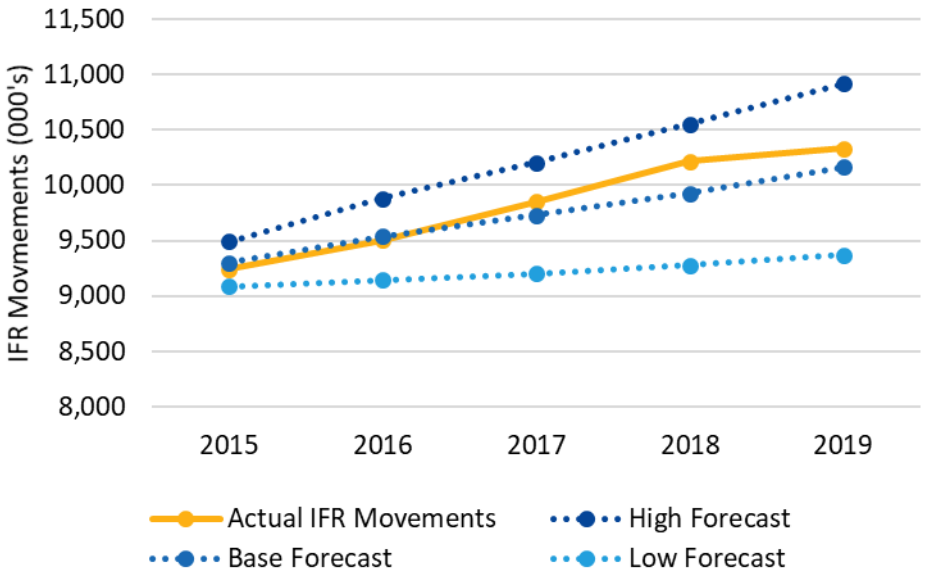


Figure 1 – Actual Union-wide movements compared with the STATFOR high, base and low forecasts (Source: EUROCONTROL Seven-Year Forecast February 2014), showing that traffic growth slowed down in 2019 and was always within the predicted range.

8 Under the performance scheme, traffic growth is not only measured in terms of movements, but also in terms of service units, which are a factor of maximum take-off weight and distance flown. An increase in service units thus does not necessarily mean more work for air navigation service providers (ANSPs), because airlines may be operating larger aircraft.

9 Throughout RP2, service units have increased and in 2018 and 2019 exceeded the high predictions in the STATFOR February 2014 base forecast as shown in Figure 2. The compounded annual growth rate during RP2 (2015-2019) was +3.7%.

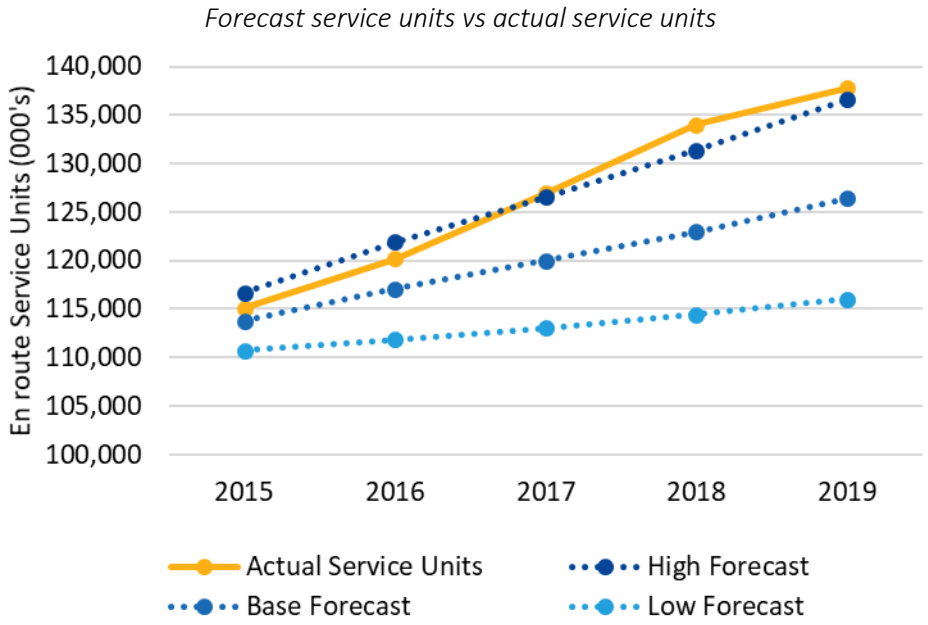


Figure 2 – Actual en route service units compared with the STATFOR high, base and low forecasts for service units (Source: EUROCONTROL Seven-Year Forecast February 2014), showing that service units continued to grow in 2019.

3 Safety

10 Under the performance and charging scheme[1], safety is monitored with three Key Performance Indicators (KPI): the effectiveness of safety management (EoSM) of national authorities and for the ANSPs, the risk analysis tool (RAT), referring to the reporting of certain categories of occurrences, and measuring the level of presence and corresponding level of absence of just culture at State and at ANSP level (FAB target).

11 The first indicator, EoSM KPI measures the minimum level of the effectiveness of safety management of the following Management Objectives (MOs) with respect to safety policy and objectives, safety risk management, safety assurance, safety promotion and safety culture. The EoSM KPI is assessed at two levels: at State level, the capability of authorities to manage the State Safety Programme (SSP) in place and, at a service provision level, the service provider's capability to manage an effective safety management system (SMS).

12 The second KPI covers the percentage of application of the severity classification based on the risk analysis tool (RAT) methodology to the reporting of certain categories of occurrences.

3.1 Effectiveness of Safety Management still needs to improve

13 In 2019, Member States continued to improve their EoSM, with a further five Member States reaching the RP2 target (maturity level "C" on all five MOs). 14 Member States did not reach all targets for RP2 achieving only level "B" on at least one component.

14 Of the 14 Member States, eight failed to reach the target for one component of EoSM (ES, FI, FR, IT, LT, LU, MT, RO). Four Member States failed to reach the target for two components (DK, NL, SE, SK), one Member State failed to reach the targets for three components (PT) and one Member State failed to reach the targets for four components (BG).This indicates that small improvements could see many Member States achieve the targets.

15 In 2019, eight Member States needed to improve in the safety culture and five needed to improve safety policy and objectives to achieve the targets.

16 All ANSPs achieved the target for safety culture, and most exceeded the targeted performance achieving either level 'D' or level 'E'.

17 Three ANSPs (CYATS of Cyprus, LFV of Sweden and LGS of Latvia) did not achieve the target in other MOs in 2019.

18 Comparing the performance of Member States with ANSPs, the ANSPs have performed much better than the Member States in respect to achieving the RP2 target. However, ANSPs started also RP2 in a better position than Member States.

19 Detailed assessments of the EoSM at State and ANSP level are available in Annex I and Annex III, including compliance with reporting.

3.2 Application of risk analysis tool (RAT) to severity classification still needs to improve

20 In 2019, the performance on the RAT KPI improved and is above or close to the targets. Only a few Member States or ANSPs are below the targets in more than one category (DK (no data provided), SP, PO). Application of the RAT by ANSPs to runway incursions (ground) trailed most behind the target in 2018, but improved in 2019 to become close to the target increasing from 81% to 99%.

[1] Commission Implementing Regulation (EU) No 390/2013 of 3 May 2013 laying down a performance scheme for air navigation services and network functions and Commission Implementing Regulation (EU) No 391/2013 of 3 May 2013 laying down a common charging scheme for air navigation services.

21 Detailed assessments of compliance with the risk analysis tool at State and ANSP level are available in Annex I and Annex III, including compliance with reporting, which in some Member States shows a considerable lack of compliance the national supervisory authorities (NSAs) and EASA should address.

3.3 Serious incidents and accidents with ANS contribution improved at Union-level

22 The number of accidents and serious incidents[2] with some contribution by the ANS shows a decreasing trend in the rate of accidents and serious incidents since 2010, with a minimum reached in 2019 without any accident with ANS contribution. The accidents shown in the graph were all non-fatal in the ten-year period analysed. Figure 3 also indicates that the trend in number of accidents (light blue bar) is decreasing from RP1 to RP2, from two accidents per year to less than one accident per year. This suggests that overall, safety outcomes with ANS contribution have improved since the beginning of the performance and charging scheme, even though there is no evidence of a causal effect with its introduction. The observation should be taken cautiously due to the low number of events considered.

Union-wide incidents and accidents with ANS contribution between 2009 and 2019

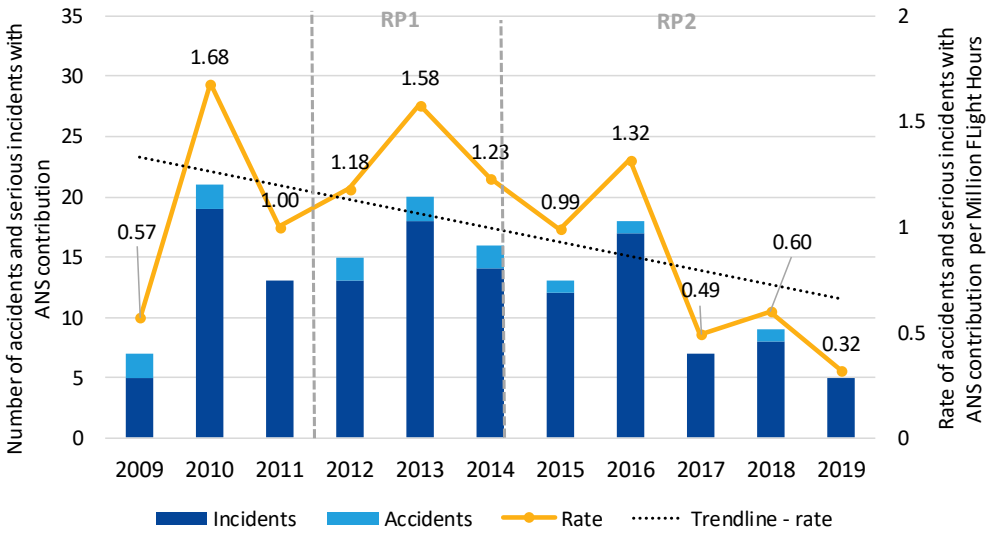


Figure 3 – ANS-related Union-wide accidents and serious incidents with ANS contribution (Source: EASA).

3.4 Cyber-security and Unmanned Aerial Vehicles (UAV)

23 Expected developments will affect the safety performance of European air traffic management. Cyber-security issues will most likely increase. The increasing use of drones will add complexity to air traffic management.

24 The effectiveness of cyber-security management will become equally important as the existing safety management. Drone operations will also require additional safety management systems, occurrence reporting and additional functions for the competent authorities. The PRB will liaise with EASA to further address these issues.

25 Proposed regulation (EASA Opinion 01/2020) related to integration of UAVs into controlled and uncontrolled airspace defined two associated services: Common Information Services (CIS) and U-

[2] Accident is an occurrence where a person is fatally or seriously injured, the aircraft sustains damage or structural failure or the aircraft is missing or is completely inaccessible. Serious incident is an incident involving circumstances indicating that an accident nearly occurred. The difference between an accident and a serious incident lies only in the result (ICAO Annex 13).

Space Services (USS) to be obtained from two different providers. While CIS Providers and USS Providers need to interact and exchange information with ANSPs, the services are not ATM/ANS services. The services are different to ANSPs with a complementary traffic management system and a separate financing mechanism. Consequently, the cost of operating CIS or USS cannot be introduced in the ANSP cost base (OPEX or CAPEX). Where an ANSP wish to provide such services, the cost shall be accounted separately and subject to a different charging mechanism than ANSPs.

4 Environment

4.1 En route environmental performance did not meet targets

26 The performance scheme measures environmental performance in terms of two KPIs, namely KEA (actual horizontal flight inefficiency) and KEP (planned horizontal flight inefficiency).

27 KEP and KEA measures environmental performance in terms of the excess horizontal length of the planned routes and actual routes respectively that an aircraft takes compared with the so-called achieved distance.

28 Both values are reported in terms of inefficiency, i.e. indicate the excess length aircraft fly. In 2019, neither of the targets was achieved (see Table 1). The actual routes flown showed an excess of 0.35 percentage points above the target and the planned routes an excess of 0.58 percentage points above the target.

29 Compared to 2018, these results are slightly better in terms of actual routes flown and slightly worse in terms of planned routes.

Environmental performance 2019		
Key Performance Indicators	Union-wide target	Actual performance
KEP – Horizontal flight inefficiency of planned route	4.10%	4.68%
KEA - Horizontal flight efficiency of actual route	2.60%	2.95%

Table 1 – Comparison of 2019 Union-wide environment targets and actual environment performances.

30 To better understand the excess planned and flown distances data shows, the PRB analysed the monthly values of KEA and KEP (see Figure 4 and Figure 5).

31 The targets for both actual and planned routes were not achieved in any month of 2019, not even in months with lower than average traffic. There are three main reasons for this outcome:

- The shortest constrained routes (SCR) according to the Network Manager's flight planning algorithms in each month of 2019 were higher than the target for planned flight efficiency, indicating that even if airspace users planned the shortest route possible, the targets could not have been achieved (i.e. ANSPs must work with the NM and neighbouring providers to shorten the length of plannable routes);[3]
- Not all Member States offer the option to airspace users to choose their route freely, without being constrained to a fixed route network (free route airspace). In 2019, 22 States offered free route airspace;
- Airspace users did not plan the shortest possible route to avoid delays or zones with high charges;
- In February 2019, even though traffic was lower than in January 2019, the actual horizontal flight efficiency worsened. There were fewer delays recorded in the network due to adverse weather and the shortest constrained route increased according to Figure 4. This

[3] SCR is the shortest route that an airspace user could have planned to fly according to the network manager.

suggests further room for improvement regarding the optimisation of airspace management.

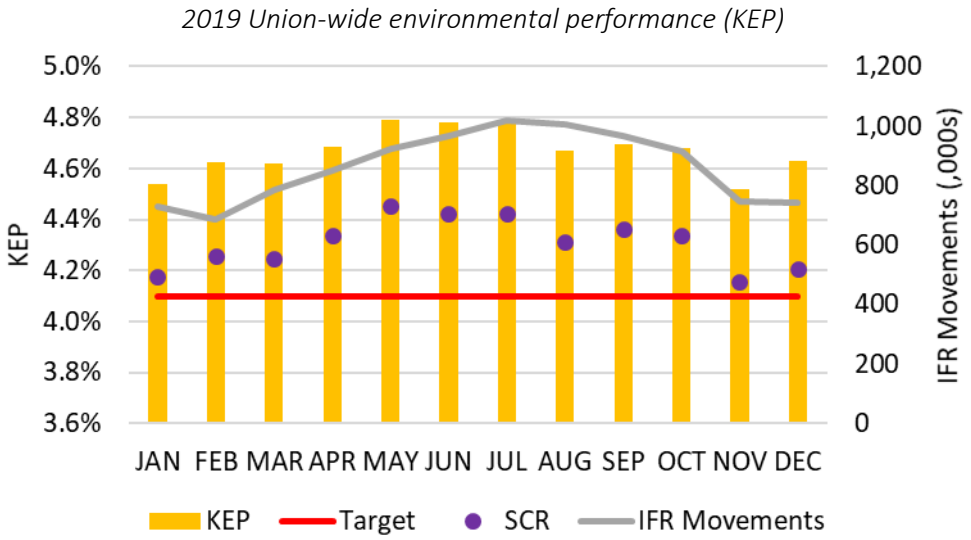


Figure 4 – Monthly KEP performance in 2019 (Source: PRB elaboration), showing the target was not achieved in any month of 2019.

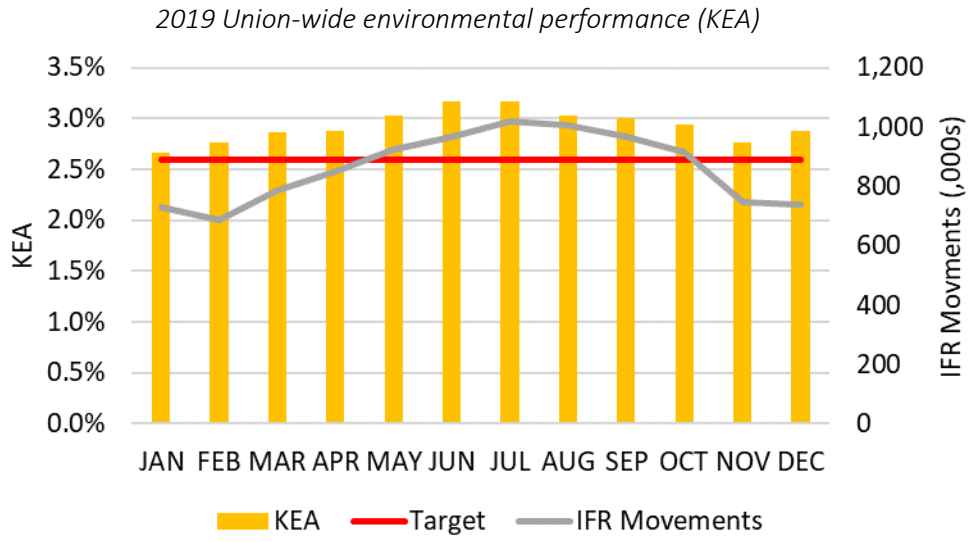


Figure 5 – Monthly KEA performance in 2019 (Source: PRB elaboration), showing the target was not achieved in any month of 2019.

4.2 *More than five minutes of additional taxi-out and holding times were spent by airspace users in terminal areas*

32 Under the performance scheme, Member States should report data for the additional time spent in terminal airspace and additional taxi-out time. The additional times are measured as those that

are considered more than the 'unimpeded' taxi-out and holding times[4].This data enables an assessment of gate-to gate environmental performance.

33 In 2019, only 40% of the regulated airports (i.e. those subject to performance monitoring) reported the required data for the additional time spend in terminal airspace and additional taxi-out time.

34 However, given the major European airports are among those airports that do report, the submitted data on environmental performance at airports covered 91% of IFR movements. Thus, it provides a good indication of the overall Union-wide environmental performance at EU airports as monitored under the Performance and Charging Regulation.

35 As shown in Figure 6, in 2019, airspace users spent on average 1.75 minutes per flight in additional holding times and 3.39 minutes per flight in additional taxi-out times.

Proportion of additional time spent to taxi out and holdings at regulated airports

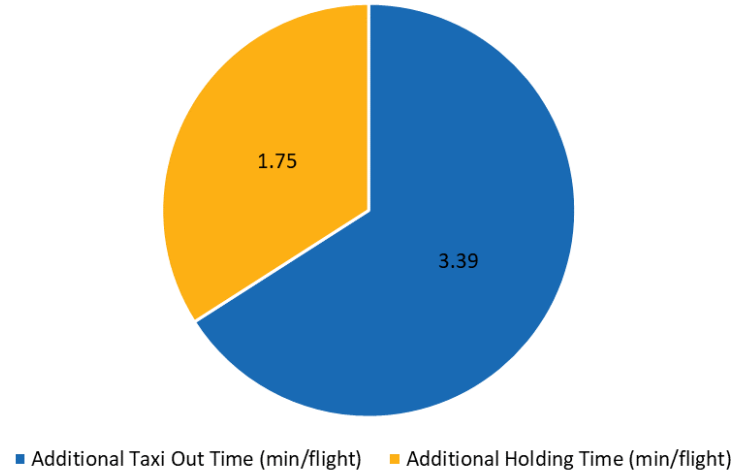


Figure 6 – Union-wide terminal environmental performance (Source: NSA Monitoring Reports), showing that additional taxi out time exceeded the additional holding times.

36 The data shows that airports need to focus on both improving ground performance and holding time performance since both constitute a sizeable portion of the overall additional time spent by airspace users in the terminal area.

37 According to Eurocontrol's Standard Inputs for Cost-Benefit Analyses, an aircraft burns three times as much fuel when it is holding in the air than on the ground taxiing. Therefore, even though additional taxi-out time is greater, both areas should be a focus for improvement.

4.3 Environmental impact of capacity measures of the Network Manager during summer 2019

38 Following the experience of summer 2018 with the high delays, the Network Manager took measures in the summer of 2019 to reduce congestion in certain areas of the SES network, relieving underperforming area control centres (ACCs).

39 The enhanced Network Measures for summer 2019 (eNM/S19) were implemented at the end of April 2019 and lifted in November 2019. They involved re-routing or level-capping flights, among other measures.

[4] Unimpeded times are those taxi out/holding times that could typically be expected when there is little traffic congestion at the regulated airports.

40 The measures reduced delays, but at the expense of decreased environmental performance with increased fuel burn.

41 The re-routing of aircraft (3% of the daily traffic in the network) resulted in an additional flight length per flight of 1.62 nautical miles.[5] Assessing the impact of flight-level restrictions (4% of the daily traffic) is more difficult. Airlines were not offered their preferred flight level, leading to vertical flight inefficiency. The impact of these restrictions are not reflected in the environment performance indicators under the SES performance scheme.

42 The Network Manager estimated that the measures combined resulted in an additional 16,000 tonnes of CO_2 emissions, which is approximately 0.02% of the yearly CO_2 output of aviation in the SES area (2019). Not only was this a minimal impact; had Member States and the Network Manager not agreed the measures, capacity shortages may have created even more emissions.

[5] Draft Network Operations Report 2019.

4.4 Civil-military dimension

43 Cooperation between civil and military air traffic management (coordination and interoperability) are a key element within SES. The Performance and Charging Regulation required Member States to draw up performance plans including a description of the civil-military dimension of the plan describing the performance of Flexible Use of Airspace (FUA) application in order to increase capacity and relevant performance indicators and targets. The RP2 performance plans rarely included quantitative and tangible measures which could be used to assess their effective contribution to capacity increase.

44 The following tools are provided by the SES regulatory framework: the concept of FUA, Performance Indicators and the Network Manager's coordination processes and supporting technical systems (i.e. LARA, PRISMIL and CIMACT).[6]

45 The performance plans submitted by Member States during RP2 rarely included measures with respect to civil-military cooperation which could be used to assess their contribution to increase capacity. Performance indicators did not reflect developments in airspace management (e.g. expansion of Free Route Airspace (FRA) application).

46 Although the civil-military performance is evaluated within the environment KPA, the civil-military relationship impacts other key performance areas as well, most directly capacity. En route and terminal delays may increase because of military activities. However, the current PIs for environment and capacity should be complemented to ensure a full understanding of the civil-military dimension. Currently, the PIs only measure the effectiveness of booking procedures which indicates the length of time that military reserved certain airspace for its own use, and how much of that time military actually used it along with their inclination to release airspace that is no longer required (see below section 4.4.1).

47 Further details on the assessment of the cooperation between civil and military air traffic management are provided in Annex I.

4.4.1 Use of booking procedures regarding use of airspace released by military remained inefficient but environmental impact still unclear

48 Improving the procedures allowing the use of airspace reserved for military purposes for civil aviation (so-called booking procedures) could improve performance of air traffic management for civil aviation in different ways: it could enhance capacity or improve environmental performance by enabling aircraft to fly shorter routes. It goes without saying that military use always has priority; the issue is whether airspace reserved for military use, and ultimately not required for that purpose, can be released for civil aircraft, allowing the FUA. Airspace reserved for special purposes must be released as efficiently as possible when not being used.

49 The performance and charging scheme aims to measure the application of FUA by setting up PIs on the effectiveness of airspace booking procedures. The PI is the ratio of time that a part of airspace is reserved and the time that the airspace was used for the reserved activity. The indicator will show how many hours a certain part of the airspace was reserved without being used.

50 In 2019, airspace was reserved for military use for a total of 670,028 hours. 46% of these hours of reservation ended up not being used for the proposed activity (see Figure 7). With respect to the reserved area, 75% of the total reservations were made by four FABs (BALTIC, DANUBE, FAB CE and FABEC).

[6] LARA, PRISMIL and CIMACT are tools available to ANSPs to plan the reservation of airspace and assess the impact it could have on civilian traffic in addition to monitoring the impact of the actual use of the airspace.

51 Only BLUE MED FAB used most of its reserved airspace. The other Member States or FABs kept most of the initially reserved airspace (79% of the initial reservations) until three hours before the planned use. As seen below, more than half of this airspace was ultimately not used.

52 Airspace not required for military use should be released as early as possible to allow airspace users to optimise their flight plans. Priority should be given for areas that have the greatest potential to shorten routes and improve capacity for civilian airspace users. However, as discussed in section 4.1, there is scope for airspace users to improve the effectiveness of their flight planning to take advantage of the airspace that is being made available.

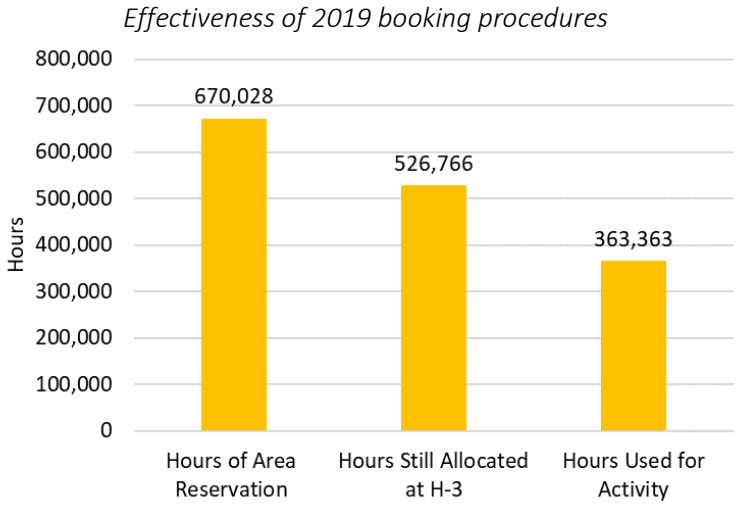


Figure 7 – Union-wide effectiveness of booking procedures (Source: NSA Monitoring Reports), showing that many hours or reserved airspace remain unused.

53 The impact of the effectiveness of booking procedures on environmental performance is unclear. It is influenced by the geographical location of the area reservations with respect to major traffic flows. Additionally, airspace users can fly through some area reservations with (ad hoc) air traffic control (ATC) clearance. Further data is necessary for assessing the environmental impact of booking procedures.

54 Currently available data, however, does allow to assess the overall environmental impact of military activity on the environmental performance of the SES: military training and related activity mostly takes place during the week and much less during weekends. Consequently, the PRB compared the KEA performance on weekend and weekdays in 2019 to help isolate the impact of area reservations on flight efficiency.[7]

55 On weekends in 2019, actual flight inefficiency (KEA) was 0.27 percentage points lower than during weekdays. Taking into account – and as shown above – that a sizeable part of the airspace reserved for the military activity was never used by the military, there is room for improvement. This particularly applies to weekdays, in order to better use the airspace the military had reserved but did not use.

56 The data suggests that while improved civil-military cooperation will improve environmental performance, it alone will not be enough to help Member States to achieve the targets.

[7] However, such an analysis in the absence of further data has limited relevance because many factors can affect weekend KEA other than area reservations, including less airspace demand and different traffic flows.

Impact on KEA between weekends and weekdays			
	Weekday	Weekend	Difference
Union-wide KEA	3.03%	2.76%	- 0.27 pp

Table 2 – Impact on KEA between weekends and weekdays.

5 Capacity

5.1 Slight improvement in en route delays, but still far away from meeting the target

57 In 2019, the Union-wide target for capacity has again been missed by far. As Table 3 shows, average en route air traffic flow management (ATFM) delay was 1.66 minutes per flight compared to a target of 0.50 minutes per flight.

Capacity performance 2019		
Key performance indicator	Union-wide Target	Actual performance
Average en route ATFM delay per flight	0.50 minutes per flight	1.66 minutes per flight

Table 3 – Comparison of 2019 Union-wide capacity target and actual capacity performance.

58 Compared to 2018, the performance with respect to delays improved and the worst fears following the untenable delays affecting millions of passengers were avoided.

59 Despite a slight increase in traffic (1.2%), average en route ATFM delays decreased by 9% in 2019. Even with the improvement compared to 2018, the delays incurred in 2019 are still 1.16 minutes higher than the Union-wide target for RP2 (as shown in Table 4).

Capacity performance in 2018 and 2019			
	2018	2019	Change
En route instrument flight rule movements	10,215,122	10,334,109	1.16%
Total minutes of en route ATFM delays	18,661,553	17,177,086	-7.95%
Average en route ATFM delay minutes per flight	1.83	1.66	-9.01%

Table 4 – Comparison between 2018 and 2019.

60 As in 2019, most of the delays were accumulated in the busy summer months as shown in Figure 8, which provides insight into the distribution of average en route ATFM delays in 2019 per month, as well as the different delay codes used by ANSPs.

61 The data shows that traffic in September 2019 was almost the same as in June, yet air navigation service providers produced much less delays in the autumn. This is presumably driven by two factors:

- Weather related delays are more common during the summer months;
- Summer months are more affected by holidays of ANSPs staff. Hence, rostering can be challenging and can reduce the resilience of certain area control centres.

62 Another outliner in terms of average delay occurred in December 2019 which was caused by industrial action (ER Disruptions (ATC) delay code) in France.

63 As in 2018, ATC capacity and ATC staffing remained the two main contributors to delay, with weather also being significant, especially during the summer months. Network Manager analysis shows that indeed the use of weather codes by ANSPs corroborated with adverse weather in Europe and shows that ANSPs did deal with challenging weather.

64 When compared to 2018, the share of delays with ATC capacity code increased from 38% to 44%, while the share of delays with ATC staffing code increased from 23% to 24%. This highlights the fact that longstanding structural capacity problems affected the network.

65 The proportion of the use of ATC related disruption code and the use of the weather delay code both decreased by four percentage points (from 7% to 3% and from 25% to 21% respectively).

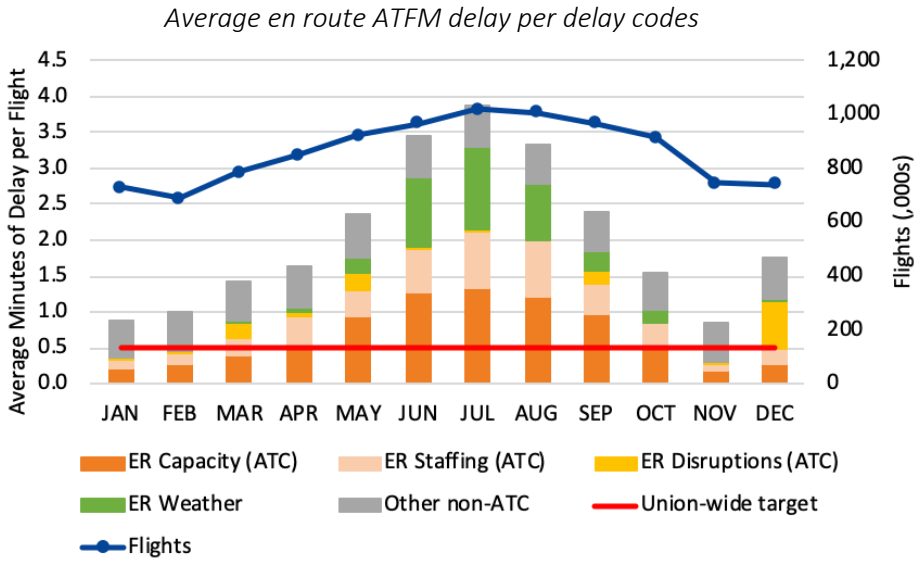


Figure 8 – Average en route ATFM delay per delay codes, compared to the Union-wide target for the KPA of capacity and instrument flight rule flights (Source: PRB interpretation of PRU Data on www.anspperformance.eu), showing that the capacity target was not achieved in any month of 2019, including those that saw non-peak levels of traffic.

66 In 2019, the geographical distribution of delays shifted significantly to the East. Union-wide en route ATFM delays of the Functional Airspace Block Europe Central (FABEC) decreased by -10%, whilst FAB Central Europe's (FAB CE's) Union-wide en route contribution increased by almost +11.5%. The combined contribution of these two FABs represents more than 83% of total en route ATFM delays, which is similar to 2018.

67 The observed shift in contributions of delays was driven by two major factors:

- Improvement of capacity performance in the Maastricht Upper Area Control Centre (MUAC). MUAC was able to reduce the average en route delay per flight by -80% - a remarkable accomplishment;
- Deterioration of performance in the area control-centres of Vienna and Budapest, with an average increase of more than +100% and +300% in average en route ATFM delay per flight, respectively. These two centres experienced a significant increase in traffic in 2017, 2018 and 2019.

68 The ACCs which generated most of the delays in 2018 (MUAC, Karlsruhe UAC, Marseille ACC, Reims ACC, Brest ACC) were able to improve their capacity performance in 2019. This improvement was not enough to meet Union-wide capacity targets and some centres (most notably Karlsruhe UAC and Marseille ACC) continued to experience structural problems and consequently contributed significantly to en route ATFM delays.

5.2 *Terminal capacity still deteriorating in 2019*

69 As well as en route ATFM delay, the performance and charging scheme establishes a local key performance indicator to target and monitor the terminal capacity offered by airports. Delays can be caused by lack of capacity at the arrival airport (so called airport arrival ATFM delays).[8]

70 The average airport arrival ATFM delay was 0.86 minutes per arrival in 2019, a 10% increase compared to 2018 as shown in Table 5. Average ATC pre-departure delay was 0.68 minutes per departure, a 6% increase compared to 2018. As for slot adherence, 94.3% of slot regulated departures managed to depart within the designated 15 minutes ATFM departure slots, representing an improvement of almost one percentage point, compared to 2018.

Terminal capacity performance		
	2018	2019
Airport arrival ATFM delay per arrival (minutes per arrival)	0.78	0.86
ATC pre-departure delay (minutes per departure)	0.64	0.68
ATFM slot adherence (percentage of regulated departures within15 minutes ATFM slot)	93.4%	94.3%

Table 5 – Average airport arrival ATFM delay, ATC pre-departure delay and ATFM slot adherence, compared to 2018 (Source: PRB interpretation of PRU Data on www.anspperformance.eu).

71 During most months, weather continued to be the main driver behind airport arrival delays, despite a more than 10 percentage points reduction in its share as compared to 2018 (57.5% to 47.2%). ATC capacity related delays peaked during the summer months, representing almost 29% of all airport arrival ATFM delays in July and August as shown in Figure 9.

72 Reasons not attributable to ATC were also significant drivers behind airport arrival ATFM delays in 2019, especially in May, June, July and September (these reasons include de-icing, airport equipment failure related disruptions, industrial action by airport staff, airport capacity, etc.).

[8] Terminal capacity is also monitored through local performance indicators, which are ATFM slot adherence i.e. the proportion of aircraft departing within 15 minutes of their allocated departure slot time and ATC pre-departure delays i.e. the delays caused by ATC, affecting the departure of flights.

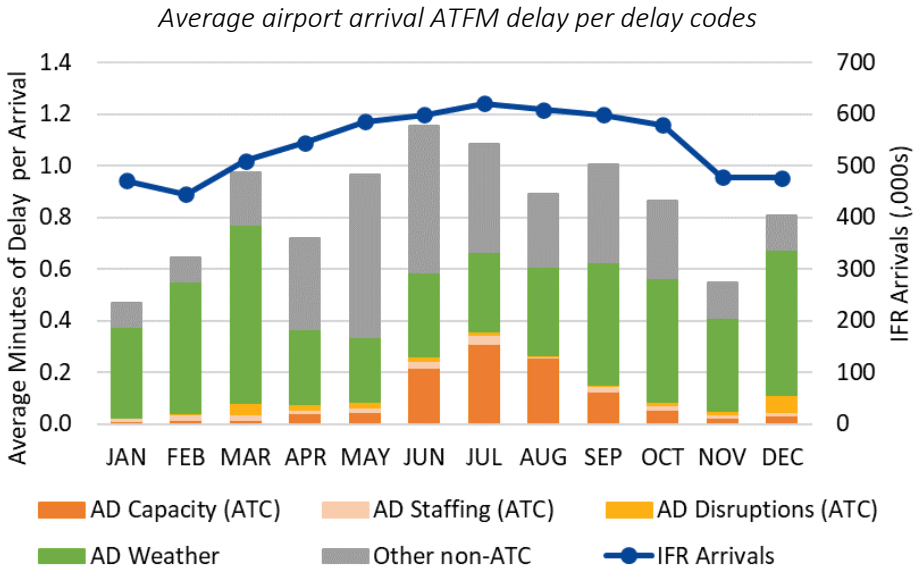


Figure 9 – Average airport arrival ATFM delay per delay codes, compared to instrument flight rule arrivals (Source: PRB interpretation of PRU Data on www.anspperformance.eu), showing the Weather code was the highest driving factor behind arrival ATM delays in almost all months in 2019.

73 The seasonal changes in airport arrival ATFM delays followed a slightly different pattern than that of 2018, most notably by a peak in March, due to adverse weather. Also, industrial action in France had a notable effect on delays in December.

74 Even though there are no Union-wide targets for terminal capacity, airspace users suffered from these delays in addition to en route ATFM delays. A more detailed analysis of local terminal capacity performance is available in Annex II of this report.

5.3 Measures of the Network Manager to mitigate delays

75 The measures taken by the Network Manager in Summer 2019 (see also section 4.4), to reduce capacity bottlenecks, focused on most constrained ACCs in the core area of Europe. As a result of the measures, traffic declined in Karlsruhe (-3%) and Maastricht (-1%) , Bremen (-3%) and remained stable in Langen.

76 The Network Manager analysed the effect of its measures against a 'no-measures' scenario, concluding that 24 million minutes of en route ATFM delay were avoided.[9] Under a 'no measures' scenario, the average en route ATFM delay per flight would have been almost four minutes per flight.

77 The measures taken by the Network Manager were possible because Member States were willing to approve the initiative taken by Eurocontrol. The measures proved to be effective, mitigating the effect of staff shortages in Karlsruhe and capacity shortages in Maastricht, whereas the situation in Marseille remained as before.

78 However, the measures were a 'fire-fighting' exercise without resolving structural issues of certain area control centres. The COVID-19 pandemic has changed this all, hopefully motivating ANSPs to use the period with low traffic to address their structural issues.

79 The measures taken by the Network Manager also had negative effects: they resulted in delays for those ANSPs receiving additional traffic redirected from the most congested sectors. Negatively

[9] Source: Network Manager Annual Network Operations Report 2019 Section 5.4, https://www.eurocontrol.int/publication/annual-network-operations-report-2019

impacted Member States include Spain, Austria, Croatia, Poland, Czech Republic, UK, Italy and Portugal. Following a collaborative decision-making (CDM) process, around 970,000 minutes of en route ATFM delay was reattributed to the ANSPs causing the shortage of capacity (mostly DFS, DSNA and MUAC).

80 In addition to these measures, the Network Manager Operations Centre (NMOC) helped to avoid an additional 2.2 million minutes of en route ATFM delay, proposing alternative routes for airlines.

81 However, to better understand the impact of these measures and the full potential such measures may have for the performance of ANSPs on the long run, more analysis will be needed.

5.4 Gate-to-gate delay analysis

82 The performance and charging scheme does not define a Performance Indicator specifically for gate-to-gate delays, i.e. a measure of the overall delays endured by airspace users including en route, terminal and ground causes. However, the PRB believes a gate-to-gate delay analysis reveals how the different types of sources of delay and flight time extensions add together to impact airspace users and will enable stakeholders to better understand the capacity challenges.

83 In this analysis, five performance indicators are used to derive a gate-to-gate delay total. These are:

- En route delay incurred due to en route sector capacity constraints;
- Arrival delay incurred due to terminal capacity constraints;
- Air traffic control pre-departure delays i.e. holding an aircraft at the stand to avoid queues on the airfield;
- Additional taxi-out time that airspace users had to wait to take-off (the additional time is calculated as the time spent taxiing beyond the standard expected taxi out time at regulated airports);
- Additional holding time before landing.

84 Due to technical difficulties of monitoring the data for air traffic control pre-departure delay, additional taxi-out time, and additional Arrival Sequencing and Metering Area (ASMA) time, only around 70 airports reported valid data out of the 174 airports in the performance scheme.

85 For the airports that reported the data, gate-to-gate delay was stable (there was an increase of 0.02 minutes per flight). The analysis shows that on average airspace users were delayed by 8.59 minutes per flight (see Table 6). Compared to 2018, performance improved in en route ATFM delays but largely remained the same in additional taxi-out time. Performance deteriorated in all other components.

Gate-to-gate delay performance		
	2018	2019
En route ATFM delay per flight (min/flight)	1.83	1.66
Arrival ATFM delay per arrival (min/arrival)	0.78	0.86
ATC pre-departure delay per departure (min/departure)	0.64	0.68
Additional taxi-out time per departure (minutes/departure)	3.57	3.56
Additional ASMA time per arrival (minutes/arrival)	1.75	1.83
Total	**8.57**	**8.59**

Table 6 – Values of gate-to-gate delay components in 2018 and 2019.

6 Cost-efficiency

6.1 *Union-wide target is achieved, however, actual costs exceeded the determined costs for the first time during the reference period*

86 In 2019, Member States met the en route cost-efficiency Union-wide target which is expressed in cost per service unit. The Union-wide actual unit costs were almost 5€$_{2009}$ lower than the 2019 determined unit cost as shown in Table 7. The Union-wide target was achieved despite the en route actual costs being higher than the determined costs (+1.4%). This positive result was possible because in 2019 the actual service units were well above the determined values (+11%).

Cost-efficiency performance 2019		
Key performance indicator	Union-wide target[10]	Actual performance
En route cost per forecast service unit (€$_{2009}$)	49.10	44.61

Table 7 – Comparison of 2019 Union-wide cost-efficiency target and actual cost-efficiency performance.

87 The numbers from 2019 illustrate that under the current performance scheme, the cost-efficiency performance of ANSPs can exceed the targets not only because they managed their business better, but because airlines used larger aircraft and operated longer flights. The increase of service units in 2019 was substantial (+11%) and at the high end of the forecast. The ANSPs benefitted from this positive development obtaining more revenues than planned. Some of the additional revenues will be returned to the airlines under the traffic risk scheme, however the ANSPs can still retain a substantial amount. The downside of this system is evident: the positive financial result may camouflage structural inefficiencies which would need action. Many of them now become more of an issue as traffic is shrinking and ANSPs are faced with high fixed cost.

88 Looking at the actual en route costs, the result of 2019 is less positive: the actual costs (6.2B€$_{2009}$) were higher than what Member States had planned in the performance plans (6.1B€$_{2009}$, +1.4%). It was the first time in RP2 that Member States spent more than planned.

89 At local levels, most of the Member States met the cost-efficiency target. Nine Member States (Belgium and Luxembourg, the Czech Republic, Estonia, the Netherlands, Norway, Portugal, Romania, Malta and Sweden) did not achieve the cost-efficiency targets. Two of these Member States (Portugal and Sweden) also did not achieve the local targets in 2018.

6.2 *Total economic costs for airspace users*

90 In 2019, the total economic cost of European air traffic management for airspace users amounted to 7.8B€$_{2009}$, out of which 6.2B€$_{2009}$ correspond to the actual costs of the service provided (6.1B€$_{2009}$ in 2018). The difference between charged amounts and actual costs was 59.6M€$_{2009}$ (343M€$_{2009}$ in 2018). In addition to the amounts airlines paid as charges, they had to absorb the cost of delays which in 2019 amounted to 1.6B€$_{2009}$ (1.7B€$_{2009}$ in 2018). ANSPs received a 0.5M€$_{2009}$ bonus for 2019 performances. This figure indicates the clear mismatch between the incentive scheme and the actual results.

[10] Union-wide target according to Commission Implementing Decision 2014/132/EU.

91 However, this analysis must take into consideration part of the actual costs that may be accounted as additional gain to the service provider, specifically the surplus embedded in the cost of capital. This surplus amounts to 272M€$_{2009}$ in 2019 (278M€$_{2009}$ in 2018). However, at the same time, part of the amounts charged in 2018 and 2019 must be returned to the airspace users in 2020 and 2021 (around 1.3B€$_{2009}$).[11]

92 The estimated cost to airspace users for air navigation services, including the cost of delay (at 100€ per minute) incurred was 7.8B€$_{2009}$. Figure 10 shows that 20% of these costs were due to en route ATFM delays.

Breakdown of the total economic cost to airspace users in 2019

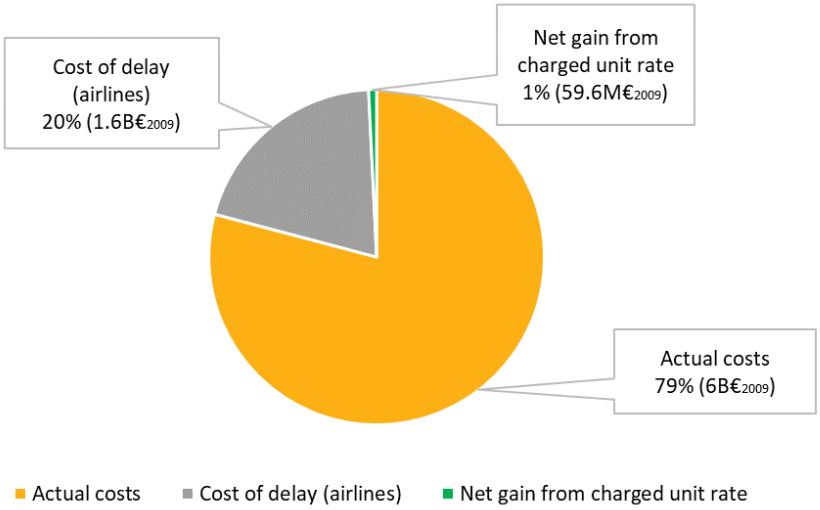


Figure 10 – Union-wide 2019 total economic cost for airspace users (Source: PRB elaboration), showing that the actual costs of ANSPs represented 79% of the total economic cost.

6.3 Staff costs

93 Staff cost remained the biggest cost block of ANSPs in 2019 (61% of the actual costs). In 2019, Member States spent 3.8B€$_{2009}$ on staff and, as in the past years, they increased above the planned values (+138M€$_{2009}$). The United Kingdom had the highest increase of actual staff costs with respect to the determined values, spending an additional +42M€$_{2009}$ (+17%), Spain Continental, spending +21M€$_{2009}$ (+6%) and Poland, spending +13M€$_{2009}$ (+2%).

94 On the other side of the spectrum, France reduced the actual staff cost with respect to the determined values by 19M€$_{2009}$ (-3%), Italy by 12M€$_{2009}$ (-4%) and Bulgaria, by 6M€$_{2009}$ (-9%). For 2019, only five charging zones (CZs), Bulgaria, France, Ireland, Italy and Switzerland registered lower than determined actual staff costs. The situation differs from 2018, when 11 CZs had lower than planned staff costs.

95 Figure 11 presents a breakdown per CZ of the determined and actual staff costs in 2019. The blue bars represent the determined staff costs for 2019, while the orange bars represent the actual staff costs registered in 2019. The grey line on the secondary axis displays the actual versus determined staff costs throughout the period, in percentages.

[11] These amounts correspond to the N+2 mechanisms (e.g. inflation adjustments, traffic risk sharing mechanism, etc.).

Staff costs 2019 determined vs actual for each charging zone (CZ)[12]

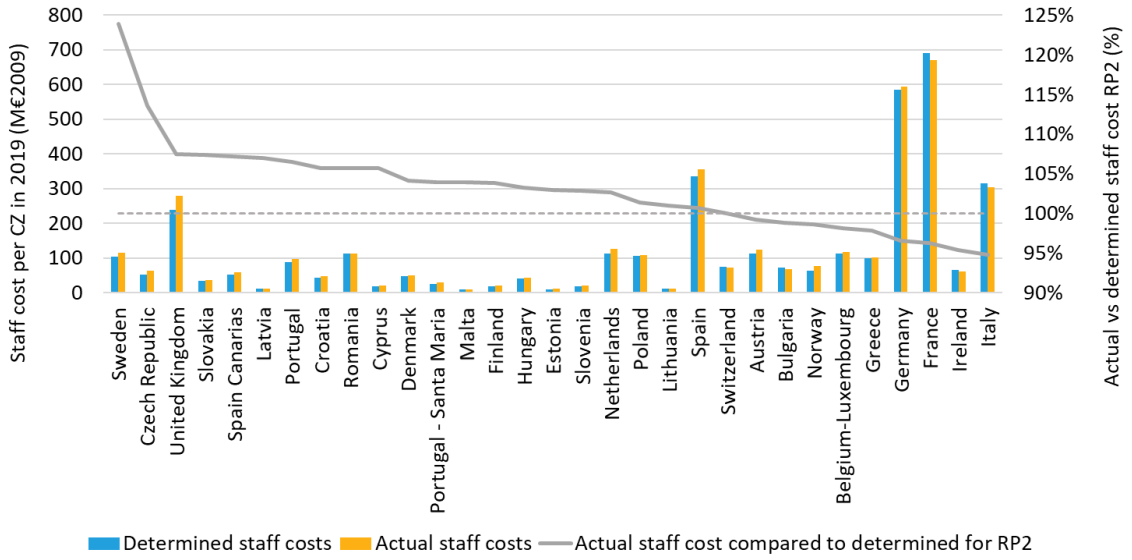


Figure 11 – 2019 Staff costs actual vs determined staff costs (Source: PRB elaboration), showing that most Member States registered higher staff costs than initially determined.

6.4 Capital expenditure (CAPEX)

96 In terms of investments, during the last year of the reference period, the Member States invested more than planned. In 2019, at Union-wide level, ANSPs overspent 144M€$_{2009}$ (+18%) with respect to planned capital expenditure.

97 The Member States with the highest capital overspend in 2019 compared to the planned amounts were the Netherlands, which spent +49M€$_{2009}$ (+474%), the United Kingdom, which spent +39M€$_{2009}$ (+44%), and Spain, which spent +25M€$_{2009}$ (+38%). The Member States that underspent most in 2019 with respect to the planned amounts were Greece, with -20M€$_{2009}$ (-93%), Ireland, with -8M€$_{2009}$ (-53%) and MUAC, with -7M€$_{2009}$ (-54%). See Figure 12 for the CAPEX for all Member States.

98 Despite higher than planned capital expenditure, in 2019, the actual costs associated to investments (depreciation and cost of capital) amount to 1,064M€$_{2009}$, being 61M€$_{2009}$ (-5%) lower than the determined costs of investments. The difference between the determined and actual costs of investments stems from the lower than planned capital expenditure in the first years of the reference period.

[12] A charging zone (CZ) is the area for which a Member State will receive revenues for the provision of air navigation services.

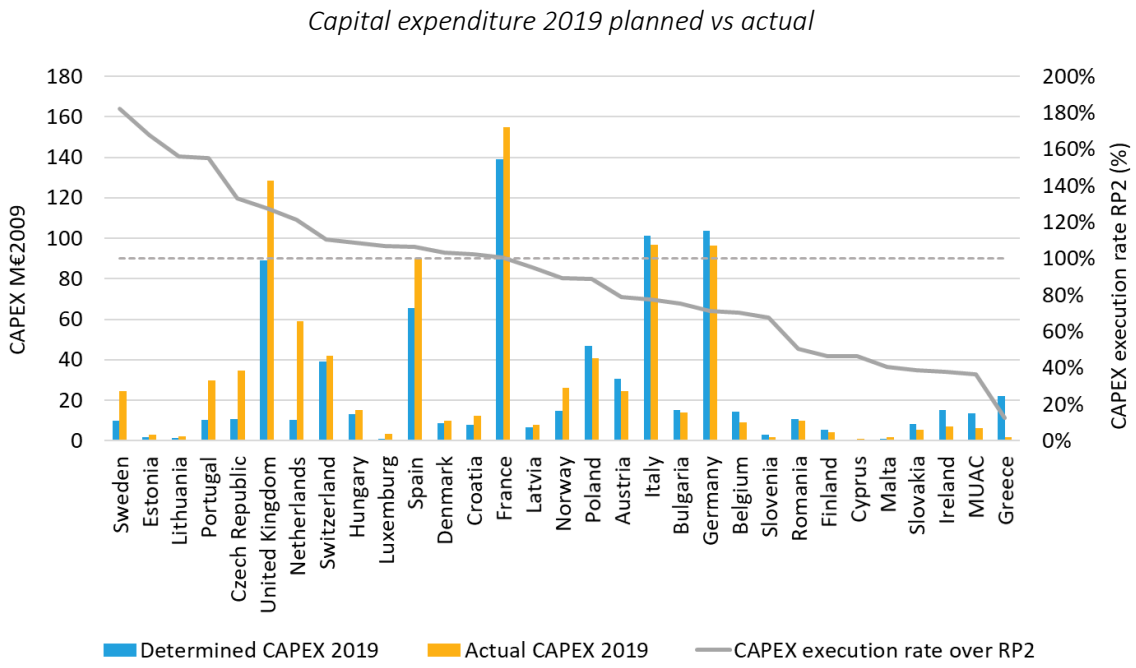


Figure 12 – Actual capital expenditure compared to planned (Source: PRB elaboration). Most Member States spent more than planned in terms of capital expenditure during 2019.[13]

[13] The amounts displayed for France do not include the category unplanned "OPEX related to CAPEX".

7 RP2 overview

99 This section provides an RP2 overview of the performance in each Key Performance Area as defined in the Performance and Charging Regulation. The analysis is based on the analysis of 2019 presented in the previous sections, and on the previous Monitoring Reports published by the PRB.

7.1 RP2 safety overview

7.1.1 Member States must improve EoSM more than their ANSPs

100 In 2015, the first year of RP2, 29 out of 30 Member States were below the FAB level targets on the Effectiveness of their Safety Management System; only the UK achieved them. In 2019, when RP2 ended, 14 Member States remained below the targets (Figure 13).

Average Union-wide Member State EoSM Scores and number of States not achieving the targets

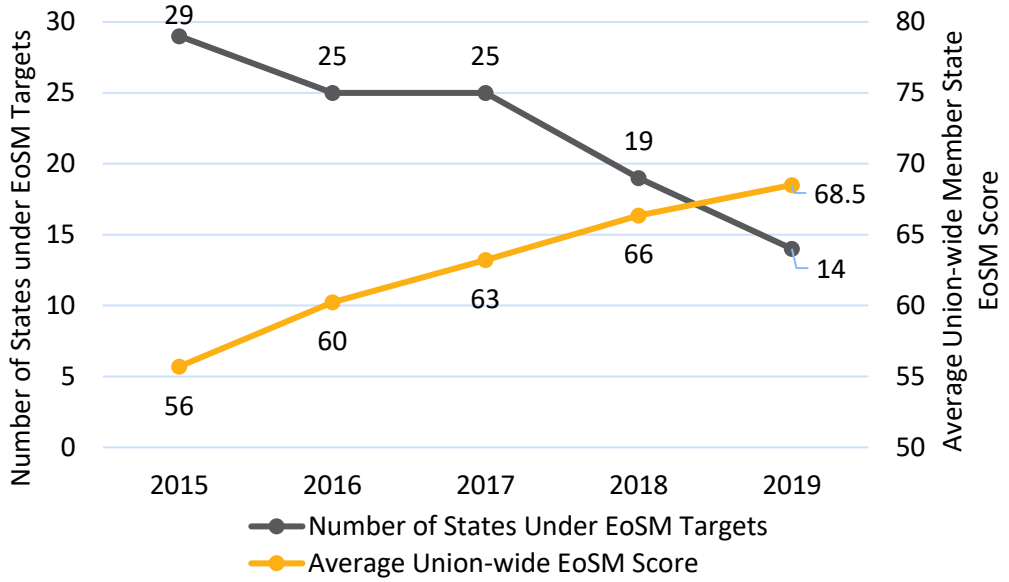


Figure 13 – Monitoring and assessment of NSA performance in the effectiveness of safety management key performance indicator (KPI) (Source: EASA), showing that substantial improvements were made and 15 Member States improved to achieve the RP2 targets.

101 Of the Member States failing to meet the FAB level targets for RP2, their performances fall in three categories:

- Four Member States implemented modest improvements or even saw their EoSM score reduced over RP2. They consequently did not reach the target;
- Three Member States implemented significant improvements and improved their EoSM score by more than 40%, but still did not reach the target on one EoSM component despite considerable effort;
- Six Member States did improve their performance, but not sufficiently to meet the target typically increasing their score by between +40% and +20% .

102 On the other hand, 21 ANSPs were below the FAB level EoSM targets in 2015 (the first year of RP2) and three ANSPs remained below the FAB level target when RP2 ended in 2019 (Figure 14). The rather modest increase in the average Union-wide ANSP EoSM score shows that many ANSPs started RP2 close to the FAB level targets and needed to improve a few areas to reach them.

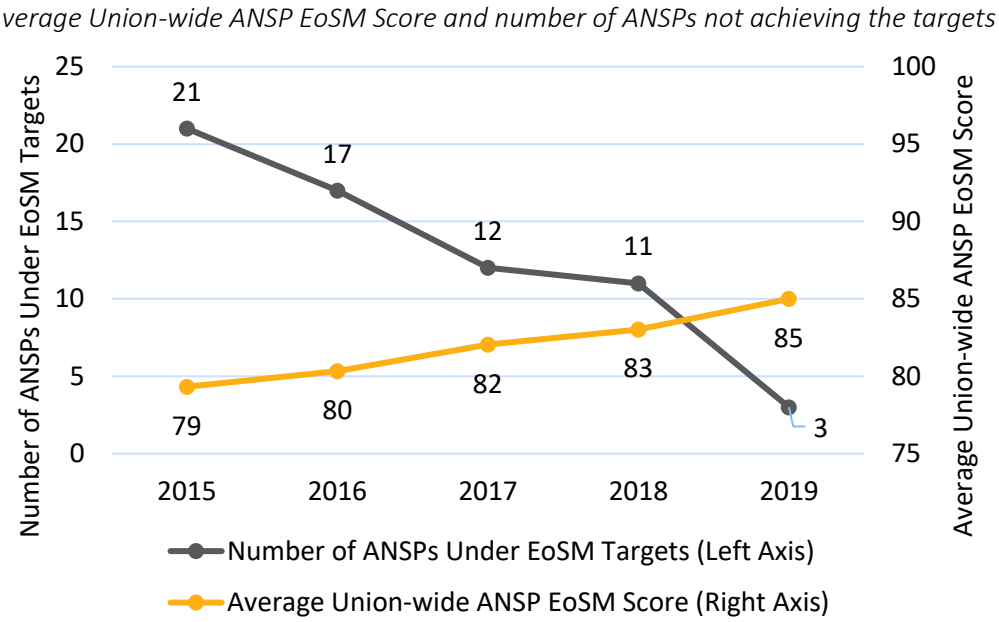


Figure 14 – Monitoring and assessment of ANSP performance in the EoSM KPI (Source: EASA), showing the number of ANSPs that are not achieving the safety targets in each year of RP2 (grey) and the development of the Union-wide average EoSM score (orange).

103 At the beginning of RP2, only one ANSP (PANSA) was below the RP2 FAB level target of level 'C' for the safety culture. PANSA improved its level in 2015 and 2016, hence all ANSPs achieved the target level 'C' for safety culture.

104 Of the ANSPs that remained below the RP2 FAB level targets at the end of the reference period, some started RP2 at a low level of maturity in several components but significantly improved over the period. These ANSPs fell only slightly short of the target for a few components. One ANSP (CYATS) was below the FAB level target on all components, except for Safety Culture.

105 The KPI for EoSM of Member States will be discontinued in RP3 according to Regulation (EU) No 2019/371 to simplify the safety part of the performance scheme and to reduce the burden on the States. Consequently, the PRB will no longer monitor the EoSM of the Member States.

106 As of RP3, Member States will be subject to the oversight by the European Union Aviation Safety Agency (EASA) in respect to their compliance with requirements under Regulation (EU) 2017/373 as part of the regular standardisation inspection process.

7.1.2 RAT performance improved but reporting on runway incursion requires improvement

107 From the Union-wide perspective, and taking all occurrences reported into account, the application of the Risk Analysis Tool (RAT) to severity classification improved between 2018 and 2019 for all types of occurrences. The analysis of occurrences and allocating the severity classification using the RAT methodology is split by the scope of the assessment: ATM Ground is assessed by ANSPs and ATM, and Overall is assessed by Member States (NSAs).

108 The application of RAT for runway incursion (RI) improved in 2019 as opposed to previous years but remained slightly below the RP2 FAB level target. The number of ANSPs / NSAs achieving the 2019 target has increased.

109 While the RAT application for RI Ground and ATM-S Ground did not reach the target of 100%, they are quite close and further improvements to reach 100% will only be required for few ANSPs.

7.2 RP2 environment overview

7.2.1 Environment targets were not achieved and no progress was made towards the KEA target relative to 2015 performance

110 In each year of RP2, the shortest constrained route (SCR) i.e. the shortest plannable routes according to the Network Manager was above the targets for the planned routes (KEP). Therefore, the targets could not have been achieved even if airspace users had planned to file flight plans according to the best routes available (see Figure 15). This indicates that ANSPs must ensure the airspace is available so that they do not restrict efficient flight planning – especially since it is correlated with actual flown distances.

111 In 2016 the KEP worsened, which could be due to a deterioration in the SCR between 2015 and 2016 although since the data is not available before 2016, it is not possible to draw a firm conclusion.

112 However, it is clear that, overall, Member States and ANSPs have worked together to ensure that an improved route network and free route airspace (where offered) is available to allow for more direct flight planning as the shortest constrained route has marginally improved year on year since 2016.

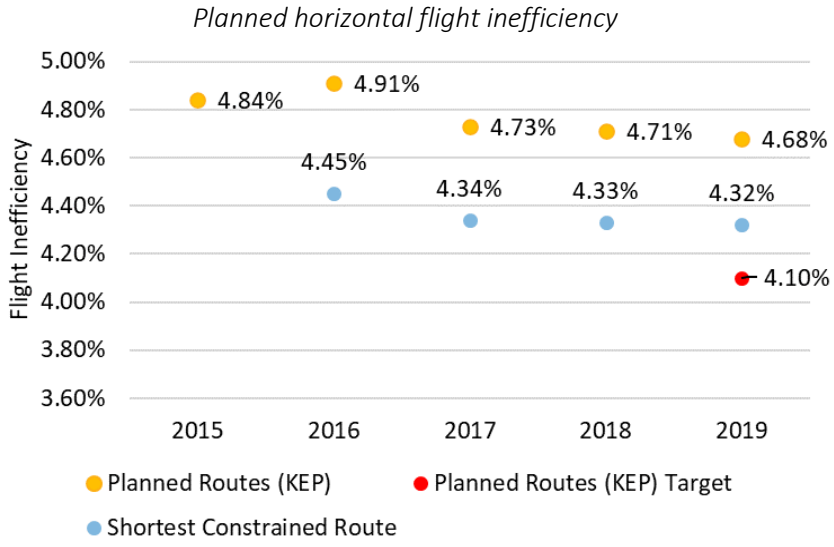


Figure 15 – Union-wide KEP and shortest constrained route (SCR) performance with the RP2 target. SCR data was only available from 2016 onwards (Source: PRB interpretation of PRU Data on www.anspperformance.eu), showing that the KEP target was not achieved in RP2.

113 Actual routes (KEA) performance also worsened in 2019 compared to the previous year and compared to the beginning of the reference period (2015). It did not reach the target which Member States should have achieved at the end of RP2 (Figure 16).

114 The flown distance is affected by many factors e.g. wind patterns, route charges, en route capacity shortages, airspace reservations, geo-political issues and – in summer 2018 and 2019 – Network Manager measures. The PRB does not have the data to assess the individual contributions of each of these factors on the environmental performance, but as the Member State factsheets at the end of this report show, there is a clear interdependency between capacity offered and environmental performance. The poor capacity performance impacted the environmental situation in 2019, particularly the delays caused by staffing and capacity of certain area control centres.

115 The environmental targets for RP2 – albeit challenging – were achievable. They were set based on historical performance and the ten worse days of performance are not considered meaning special events or particularly bad weather is not accounted for to some extent. One reason for missing the targets is the fact that free route airspace which should improve horizontal flight efficiency but is yet to be available Union-wide.

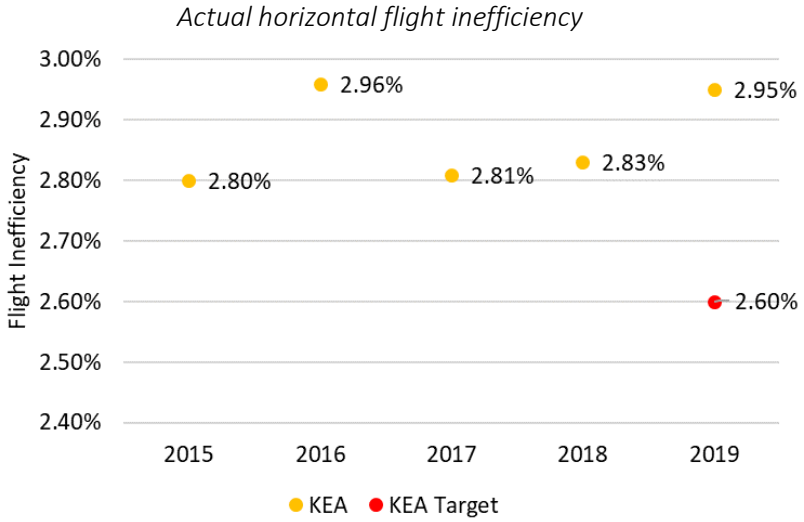


Figure 16 – Union-wide KEA performance during RP2 with the RP2 target (Source: PRB interpretation of PRU Data on www.anspperformance.eu), showing that the KEP target was not achieved.

7.2.2 CO_2 output of European aviation continued to increase

116 Reducing man-made greenhouse gas emissions has become a political priority, especially in the EU. Aviation is also expected to reduce its CO_2 emissions.

117 Although the KPIs provide a good assessment of environmental performance by measuring distances flown compared to the most direct distance, the translation of this into actual greenhouse gas emissions is not as straightforward.

118 A unit of distance is not equal when it comes to calculating the emissions of aircraft since the latter depends on the weather, altitude, aircraft type, configuration, payload and other factors. For this reason, the PRB is evaluating which additional measure and metrics could be considered to finetune and improve the environmental impact of Member States and ANSPs under the performance scheme.

119 For these reasons, the PRB used the EU Emissions Trading System (EU ETS) data to understand the trends of CO_2 equivalent emissions within the Single European Sky attributed to aviation in order to assess the results of environmental performance discussed in the previous section. Under the EU ETS, airlines operating flights[14] within the EU and the European Economic Area (EEA), are required to monitor, report, and verify their emissions.[15]

120 The CO_2 equivalents ($MtCO_2e$) emitted by aircraft flying from those States that are a part of the SES RP2 area continued to increase in 2019. Figure 17 shows however that the growth in emission slowed down as traffic growth did likewise.

[14] All flights that are not State, humanitarian, medical, military or fire-fighting missions
[15] EU Emissions Trading Scheme

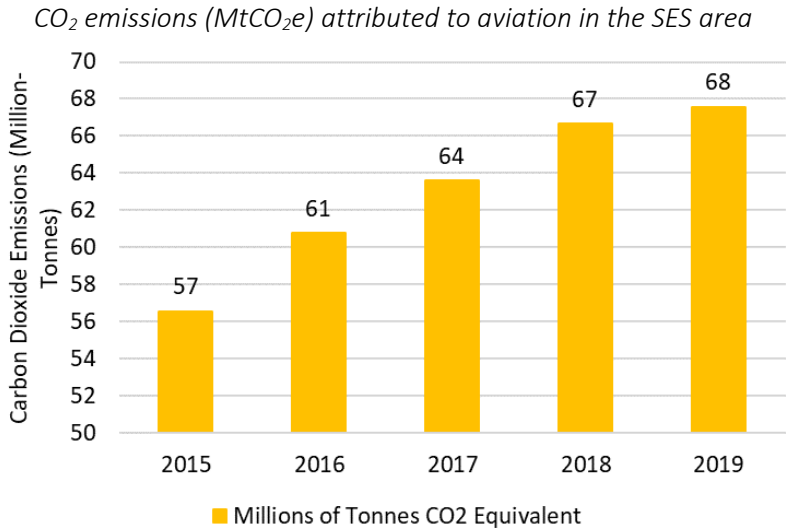


Figure 17 – CO_2 emissions attributed to aviation according to the EU Emissions Trading System data (Source: EU ETS data), showing that greenhouse gas emissions continued to rise in 2018.

121 Aviation-related emissions increased between 2015 and 2018 by approximately 17%. As the KEA indicator shows, an additional 30 meters of excess distance was flown for every 100km. However, this does not fully explain the increase in emissions. Other factors such as longer distances flown or higher maximum take-off weights play a role.

122 The PRB has initiated several steps to help identify meaningful additional metrics for the performance scheme to enhance the Members States' and ANSPs ability to impact the level of greenhouse gas emissions.

7.2.3 Terminal environmental performance worsened during RP2

123 In addition to the en route KPIs, the performance and charging scheme established terminal performance indicators that measure additional taxi-out times and additional sequencing and metering area time.

124 Figure 18 shows that during RP2, the additional time that airspace users had to spend in the terminal area either taxiing out or holding has slowly increased. In addition to being harmful for the environment, the additional time costs airspace users time which could be spent optimising the block time and hence has a monetary impact too. The additional time spent holding in terminal airspace reduced slightly in 2019 compared to 2015, indicating a stable performance.

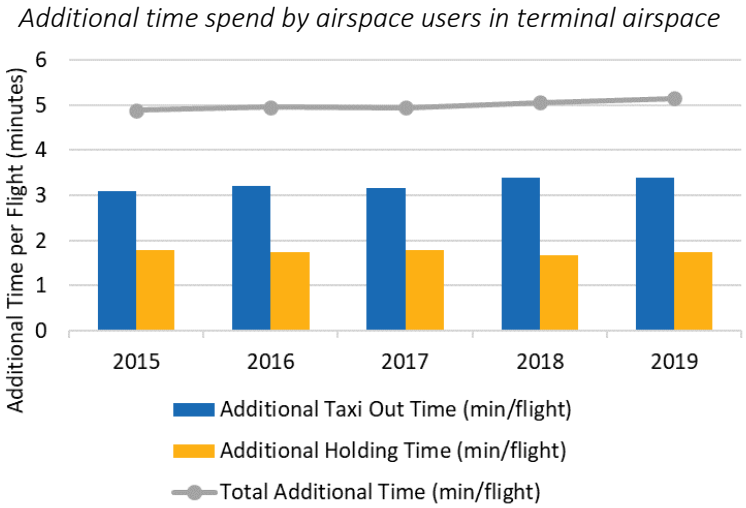


Figure 18 – Progress of regulated airports in terminal environmental performance (Source: NSA Monitoring Reports), showing that performance worsened slightly led by higher additional taxi-out times.

7.3 RP2 capacity overview

7.3.1 Improvement in 2019, following four years of deterioration

125 The Union-wide target for average en route delay was set at 0.5 minutes per flight for all years of RP2. Member States were not able to meet the Union-wide target in any of the years of RP2. To the contrary, en route delays increased over RP2, reaching their peak in 2018 with 1.83 minutes per flight despite the fact that the number of movements increased at a much lower rate (year-on-year increase ranging from +1.2% - +3.7%). During RP2, traffic increased by +13% and delays increased by +209% in total minutes of en route ATFM delay (Figure 19).

En route (ER) delays per delay code with the instrument flight rule movements and delays shown indexed to the previous year

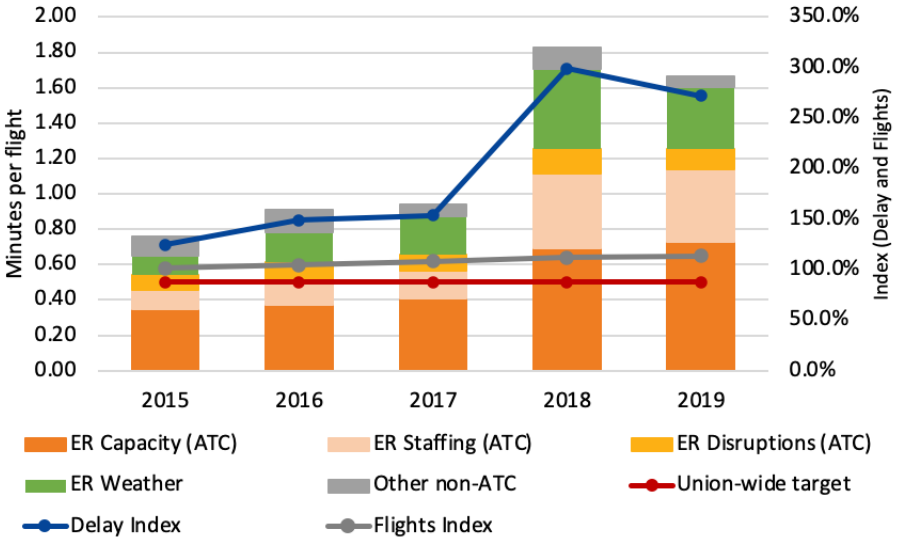


Figure 19 – The evolution of average en route ATFM delay and the distribution across delay codes in RP2 (Source: PRB interpretation of PRU Data on www.anspperformance.eu), the delay and traffic indices show the change compared to the previous year.

126 The distribution of the delays across delay codes remained mostly the same year to year during RP2. Based on the codes allocated to the delays by the ANSPs, capacity in the control centres, weather and staffing were the main reasons and increased in absolute terms during RP2. Industrial action occurred during each year, causing delays at Union-wide level. The proportion of the ATC staffing code increased by +9 percentage points, from 15% to 24% over the period.

127 The geographical distribution of en route ATFM delays changed significantly over RP2. This tendency was partly caused by several geopolitical crises affecting the airspace over Ukraine and the Middle East. This resulted in an unexpected growth of traffic, especially in the Eastern and South-Eastern parts of the SES area. Increasing delays in FAB CE led to an increase in the FAB's contribution to total Union-wide delays by almost 20 percentage points over RP2. At the same time, the contribution of the other FABs decreased (most notably the contribution of FABEC, by around ten percentage points), although FABEC still contributed 61.5% towards the total delays.

128 The improvement in en route capacity performance in 2019 may give rise to some optimism, namely considering that the unacceptable delays during 2018 led to a joint effort to mitigate delays. The Network Manager took an initiative which Member States supported and implemented at national levels. At the same time, all stakeholders (namely airlines and airports) successfully

started joint actions. This sense of essential cooperation not only helped to improve the delay situation in 2019 but will be crucially important to manage the dramatic impact of COVID-19 on aviation.

129 The reasons for the sobering capacity results during RP2 are also structural. ANSPs are unable to react to changes in traffic levels on the short term, and cannot maintain an optimum capacity buffer which would help absorb variations. They also struggle to implement the necessary large scale changes and to engage in more dynamic and flexible cross-border cooperation to mitigate peaks and growth in demand.

130 Based on the results achieved by some ANSPs in 2019 (most notably MUAC and NATS), and given the improvements due to the co-ordinated measures from the Network Manager, the Union-wide capacity targets set for RP2 should have been achievable.

7.3.2 A steady deterioration of terminal capacity performance over RP2

131 During RP2, the average arrival and pre-departure delay at airports has deteriorated in every year of RP2, when compared to the previous year. However, slot adherence, improved consistently in every year of RP2. Table 8 summarises terminal capacity performance in RP2.

Terminal capacity performance over RP2					
	2015	2016	2017	2018	2019
Airport arrival ATFM delay per arrival (minutes per arrival)	0.64	0.67	0.74	0.78	0.86
ATC pre-departure delay (minutes per departure)	0.46	0.53	0.57	0.64	0.68
ATFM slot adherence (percentage of regulated departures within15 minutes ATFM slot)	91.4%	91.7%	92.3%	93.4%	94.3%

Table 8 – Average airport arrival ATFM delay, ATC pre-departure delay and ATFM slot adherence over RP2 (Source PRB interpretation of PRU Data on www.anspperformance.eu), showing a deteriorating performance in delays, and a steady improvement in slot adherence.

132 As shown in Figure 20, adverse weather was the main contributing factor throughout RP2 in arrival ATFM delays, together with non-ATC related causes. ATC capacity-related delays represent an increasing proportion in RP2, with an almost 10 percentage point increase in their contribution. ATC disruptions and ATC staffing stayed low during RP2 in absolute values, as well as compared to other delay causes.

133 There has been a substantial increase in the proportion and absolute values of ATC capacity related airport arrival ATFM delays, which indicates that there are structural problems behind the deteriorating performance during RP2.

Aerodrome (AD) delays per delay code and the number of instrument flight rule arrivals by year

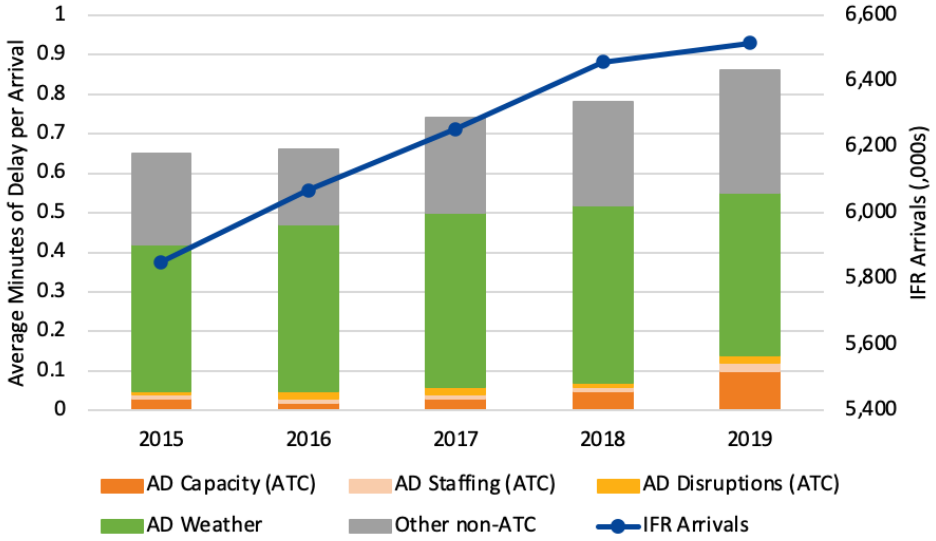


Figure 20 – Average airport arrival ATFM delays across delay codes and compared to arrivals in RP2 (Source: PRB interpretation of PRU Data on www.anspperformance.eu), showing a deterioration of performance in every year of RP2.

7.4 RP2 cost-efficiency overview

7.4.1 Union-wide targets were achieved in each year of RP2

134 During RP2, the en route cost-efficiency Union-wide targets have been achieved in each year of the reference period. The Union-wide actual unit cost decreased by -13% over the reference period (from 52.87€$_{2009}$ to 44.61€$_{2009}$) and has been on average 5€$_{2009}$ (-9%) below the determined unit cost within the RP2 decision (4€$_{2009}$ below the determined unit cost of the aggregated performance plans).[16]

135 Higher service units and lower actual costs than the determined cost allowed Member States to achieve the Union-wide targets for each year of the reference period.

136 The lower actual costs may signal a deficiency in the planning process, in which some ANSPs prioritised accounting conservatism over the ambition of more efficiency and the provision of more capacity. Alternatively, the lower actual unit cost may indicate that the targets lacked ambition. Both reasons have led to the current situation in which the system is far from optimality and, if repeated in RP3, would move away from the SES ambitions.

137 Actual costs remained flat over the reference period (on average 6.1B€$_{2009}$) and below the determined cost, with the only exception of 2019. This behaviour may signal a tendency to increase of the cost base in preparation of the third reference period (2019 is the baseline used for the RP3 targets).

138 Figure 21 shows the evolution of actual and determined values over RP2 (in terms of total costs and unit costs). The blue bars represent the determined costs, and the orange bars represent the actual costs. On the secondary axis, the blue line represents the evolution of the determined unit costs, while the orange line represents the evolution of the actual unit costs.

Actual costs vs determined (planned) costs

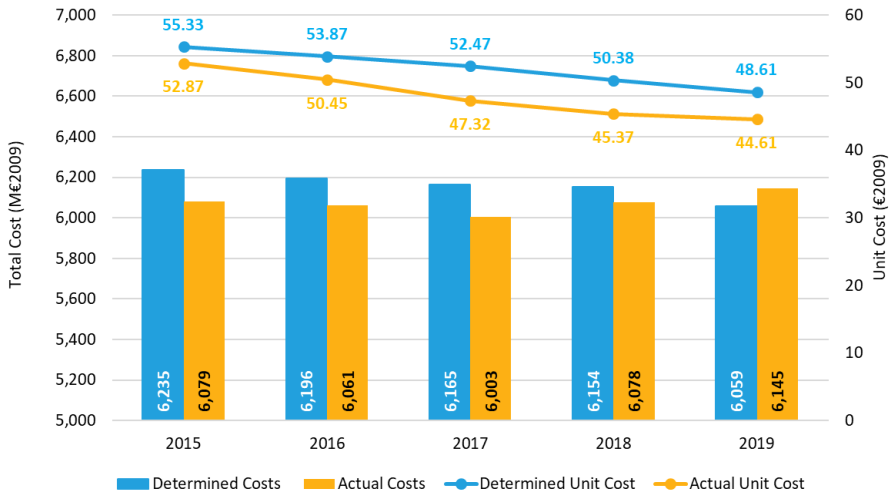


Figure 21 – En route unit and total cost actual vs. performance plans (Source: PRB elaboration), showing actual costs below the determined cost except for the last year of the second reference period.

139 Throughout the period, Member States (at CZ level) registered actual staff costs 57M€$_{2009}$ higher than the determined staff cost. However, this did not necessarily translate into performance improvements as the delays throughout the period remained at a high level. Despite being one of

[16] Union-wide target according to Commission Implementing Decision 2014/132/EU.

the main contributors to the total delays, CZs such as Germany and France underspent in staff costs throughout the period (with respect to the determined values), being among the CZs in which the lower than planned actual staff cost showed the biggest difference (in %) with the determined values.

140 Despite overspending in the last two years of the period, the Member States are still lagging behind by 404M€$_{2009}$ (-8%) compared to the total planned investments for RP2. During the last two years of RP2, higher CAPEX was spent compared to the plans, which indicates that ANSPs intended to "catch up" with the amounts underspent during the first years of the period. The delays in investments resulted in actual costs related to investments (i.e. depreciation and cost of capital) lower than the determined values. During RP2, a total amount of 371M€$_{2009}$ has been charged to airspace users for investments not realised.[17]

7.4.2 Total economic cost for airspace users was 10% higher in 2019 compared to 2015

141 During RP2, the total economic cost of airspace users for en route air navigation services amounts to over 37.6B€$_{2009}$, out of which 30.4B€$_{2009}$ (80%) correspond to actual costs of the en route air navigation service provision. 1.7B€$_{2009}$ (5%) represent the difference between charged amounts and actual costs, and 5.5B€$_{2009}$ (15%) represent the costs of the ATFM delay.[18]

142 Compared to 2015, the 2019 total economic cost to airspace users increased by 10% (from 7.1B€$_{2009}$ to 7.8B€$_{2009}$), although there was an improvement for the first time in the total economic cost between 2018 and 2019 driven by the poor delay performance in 2018 and the improvements in 2019. Delay costs averaged 1.1 B€$_{2009}$ over the reference period, increasing from 0.6B€$_{2009}$ in 2015 to 1.6B€$_{2009}$ in 2019. At the same time, ANSPs have received an average of 9M€$_{2009}$ bonus from the incentive scheme over the reference period.

143 Figure 22 shows the estimated cost to airspace users for air navigation services, including the cost of delay (at 100€ per minute) incurred.[19] The grey bars represent the cost of delays incurred by airspace users, the green bars represent the difference between the charged costs and actual costs, while the orange bars represent the actual costs. On the secondary axis, the black line represents the instrument flight rule movements index while the blue line represents the total economic cost for airspace users index (2015=1).

[17] The value includes both en route and terminal.
[18] Part of the amounts charged in 2018 and 2019 must be returned to the airspace users through the N+2 mechanisms (e.g. inflation adjustments, traffic risk sharing mechanism, etc.).
[19] 100€ in 2014 Euros as defined in the study by the University of Westminster 'The cost of delay to air transport in Europe', corresponding to 90.7€$_{2009}$.

Total economic cost to airspace users since 2015 (RP2) including the increase in traffic and the total economic cost for airspace users index

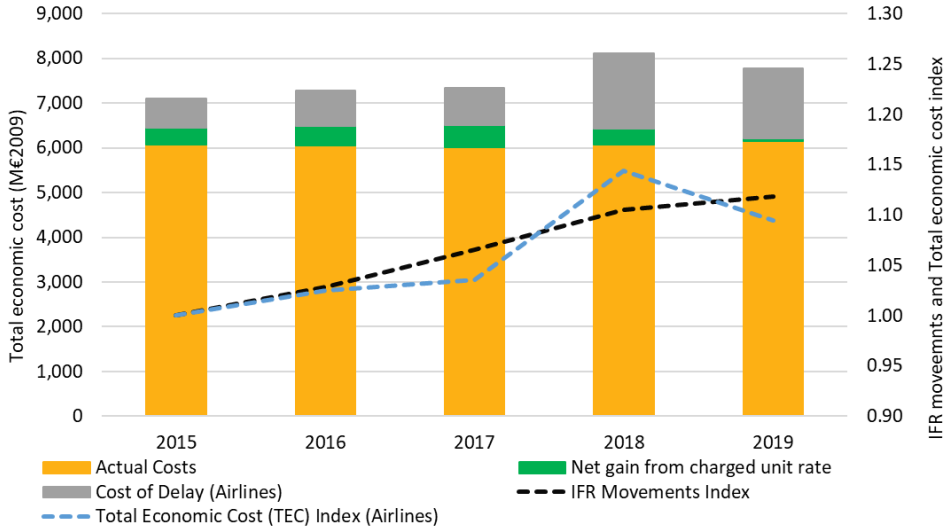


Figure 22 – Union-wide total economic cost for airspace users (Source: PRB elaboration), showing that actual costs of ANSPs remained constant, while the total economic cost borne by airspace users slightly decreased in 2019 compared to 2018.

8 Key conclusions and PRB recommendations

144 The key conclusions from the PRB monitoring of 2019 performance are summarised for each KPA in this section, followed by a specific PRB recommendation to help improve the future ANS performance.

8.1 Safety

145 Based on the analysis presented in section 3 and 7.1, the PRB makes the following conclusions and recommendations:

146 Conclusion 1: Despite significant improvements in the effectiveness of safety management during RP2, almost half of Member States did not achieve the targets.

SAF-1: The Commission should encourage EASA to monitor the continued oversight of Member States' measures to improve the maturity of the Safety Management Systems despite the discontinued use of EoSM on the basis of Commission Implementing Regulation (EU) 2017/373 and the result of EASA standardisation inspections.

147 Conclusion 2: Most ANSPs achieved the EoSM targets at the end of RP2 with slight improvements in their scores compared to 2015. This indicates that ANSPs were not far from achieving the targets and with small improvements, all ANSPs should achieve the targets in the first year of RP3.

SAF-2: The Commission should encourage EASA and the NSAs to support the three ANSPs (CYATS from Cyprus, LFV from Sweden and LGS from Latvia) not reaching the RP2 target on the EoSM to improve quickly at the start of RP3.

148 Conclusion 3: The development of the number of occurrences over RP2 show an increasing trend in absolute numbers for runway incursions, airspace infringement and ATM specific occurrences. The rates of accidents and serious incidents improved over RP2.

SAF 3: The Commission should encourage EASA to analyse, through engagement with local ANSPs and NSAs, the trend in number of occurrences to ensure that it does not reflect a deterioration of safety performance.

149 Conclusion 4: The year-by-year change of reported occurrences within FABs are a concern as they continue to show large variations as also reported for 2017 and 2018 (e.g. between 2018 and 2019 runway incursions for UK FAB increased by 374%, airspace infringement for FAB CE increased by 226%, ATM specific occurrences increased by 296% for DK-SE FAB). The underlying factors giving the variations are unknown.

SAF 4: The Commission should encourage EASA to closely analyse what has led to the substantial variations and as applicable address the root cause where such indicate a deterioration of safety performance through engagement with local ANSPs and NSAs.

8.2 Environment

150 Based on the analysis presented in section 4 and 7.2, the PRB makes the following conclusions and recommendations:

151 Conclusion 1: The achieved KEP is higher than the shortest constrained route according to the Network Manager. Airspace users did not plan flights to take advantage of the shortest available routes due to other priorities i.e. costs and delays.

ENV-1: The Commission should encourage the Network Manager to improve the re-routing proposals for airspace users to ensure greater awareness of shorter flight plannable routes and improve uptake of proposed routings. The Commission should encourage the Network Manager to work with ANSPs to minimise route restrictions.

152 Conclusion 2: The shortest constrained route according to the Network Manager's flight planning algorithms is longer than the Union-wide KEP target, indicating that airspace users could not have achieved the target because airspace was not available (due to airspace and route restrictions). Nevertheless, according to the European Route Network Improvement Plan the targets should have been met if the suggested airspace and route projects were implemented.

ENV-2: The Commission should encourage collaboration with the Network Manager to implement Free Route Airspace and Flexible Use of Airspace. Accordingly, airspace users should plan flights effectively.

153 Conclusion 3: The achieved KEA missed the targets by 0.2 percentage points in 2015 and since then has only gotten further away from achieving the target (KEA target was missed by 0.35 percentage points in 2019). Contributions to the observed performance are attributable to both airspace users and ANSPs.

ENV-3: The Commission should encourage ANSPs to accelerate the deployment of FRA projects to allow airspace users the possibility to fly more direct routes. Until now, 22 Member States have some form of FRA, although many of these could improve the availability and lowest available flight level limits. FRA has the possibility to offer tangible benefits that depend on the effectiveness of implementation.

154 Conclusion 4: Terminal environmental performance worsened but no targets could be set as the current regulatory framework does not require them. This meant that Member States did not adopt corrective measures.

ENV-4: The Commission should consider improving the environmental KPIs to establish target setting for terminal environmental performance. The PRB is investigating new KPIs for the Commission to consider for RP4 and will take account of work conducted by other bodies.

8.3 Capacity

155 Based on the analysis presented in section 5 and 7.2, the PRB make the following conclusions and recommendations:

156 Conclusion 1: Five ANSPs (DFS, DSNA, Austro Control, HungaroControl, and ENAIRE) generated around 80% of the Union-wide delays in 2019. The use of delay codes behind these delays show, that the lack of ATC capacity and ATC staffing issues were the main causes, apart from Austro Control, where adverse weather was a key driver. In 2018 the situation was similar, but the five ANSPs were DSNA, DFS, MUAC, ENAIRE, and NATS. Out of these, NATS and MUAC was able to significantly improve their capacity performance in 2019.

CAP-1: The Commission should encourage NSAs and ANSPs (in particular MUAC and NATS) to share best practices as regards the resolution of capacity and staffing related problems in ACCs to continue the reduction of delays.

Conclusion 2: In 2019, Network Manager actively intervened in the flows of traffic between April and November, with the implementation of the eNM/S19 measures. Based on the Network Manager Annual Network Operations Report 2019, the measures helped to avoid significant delays during the summer months. The PRB finds it crucial to understand in detail the mechanisms

through which the capacity benefits have been realised, and how these mechanisms affected the individual ACCs and the European ATM network as well.

CAP-2: The Commission should invite EASA to conduct more detailed analysis regarding the impact of the eNM/S19 measures.

157 Conclusion 3: Weather delays were again more often attributed to the cause of delays during the summer, which the Network Manager confirmed as justified. Improved cooperation between MET offices, airspace users and the Network Manager will be important.

CAP-3: The Commission should encourage ANSPs to increase their resilience to the impact of adverse weather on en route capacity by establishing strong CDM processes with their MET offices, airspace users and the Network Manager.

158 Conclusion 4: Staffing shortages due to strikes created delays in December 2019 that would not normally occur and caused significant delays during the summer months.

CAP-4: The Commission should encourage Member States, NSAs and ANSPs to mitigate the impact of industrial action related disruptions on capacity performance, by applying comprehensive change management procedures.

159 Conclusion 5: Capacity performance shows that some ANSPs have excess capacity and some do not offer sufficient capacity.

CAP-5: The Commission should encourage ANSPs to increase their overall resilience of volatility in traffic demand and their flexibility through more dynamic cross-border cooperation.

160 Conclusion 6: Many FABs were not able to manage growth, even when it was around their baseline forecasts. Delay performance shows that some ANSPs in FABEC, SW FAB, and BLUE MED were not prepared to handle traffic growth. ANSPs in FAB CE and DANUBE experienced high traffic growth, between 2017 and 2019, and were not able to accommodate the additional traffic without increasing delays. The traffic growth increased revenues of ANSPs, which would have enabled them to finance capacity improvement measures. However, most ANSPs were not able to invest additional money in a way to improve capacity. This has led to a continuously deteriorating performance between 2015 and 2018, with only a slight improvement in 2019.

CAP-6: The Commission should consider introducing stronger incentives to drive ANSPs towards investing additional revenues stemming from traffic growth into improving their capacity.

161 Conclusion 7: Despite all the efforts spent in SESAR projects, and the best intention of some ANSPs, the opportunities to share and allocate capacity between ANSPs and balance out insufficient capacity when demand was high have been very limited.

CAP-7: The Commission should encourage Member States to implement SESAR solutions and opportunities and their introduction into the daily operation of ANSPs in a structured manner, as this is key to resolving the longstanding capacity problems. The potential of digitalisation as illustrated by the Airspace Architecture Study should be exploited in this regard.

162 Conclusion 8: Technical difficulties of implementing the required monitoring systems hinder the measurement of terminal capacity PIs for a significant number of airports, which are under the scope of the performance and charging scheme. This results in an incomplete view of capacity performance and is blocking the full application of the scheme.

CAP-8: The Commission should encourage Member States, ANSPs, and airports to deploy the necessary equipment and implement the processes required to measure all relevant PIs, and provide valid data for all airports subject to the performance and charging scheme.

8.4 Cost-efficiency

163 Based on the analysis presented in section 6 and 7.4, the PRB makes the following conclusions and recommendations:

164 Conclusion 1: Overall, Member States incurred actual costs that were below the determined costs over RP2.

CEF-1: The Commission should encourage Member States to ensure that their ANSPs invest the gains accumulated from regulated activities into capacity enhancing measures.

165 Conclusion 2: Between 2015 and 2018, Member States consistently spent less than the determined costs, but in 2019 (the year used to establish a baseline determined cost for RP3) actual cost was higher than the determined cost.

CEF-2: The Commission should establish the baseline starting point of the subsequent reference period based not only on a single year of the period.

166 Conclusion 3: During RP2, Member States have received 371M€$_{2009}$ for investments not materialised.

CEF-3: The Commission should encourage Member States to oblige their ANSPs to not double charge these amounts in RP3, especially in view of the extremely challenging financial situation of airlines due to the COVID-19 pandemic.

167 Conclusion 4: The impact of the incentive scheme was limited in terms of motivating ANSPs to improve their performance, especially considering that ANSPs underperformances in terms of delays are passed through airlines.

CEF-4: The Commission should establish an effective incentive scheme (bonus and penalties). It should consider the interdependencies between all KPAs to effectively drive ANSPs behaviour.

168 Conclusion 5: During RP2, the actual unit cost were on average 9% lower than the target adopted by the Commission following the SSC's examination procedure and 1% lower than the initial proposal of the Commission. This raises the question whether the adopted targets were adequate.

CEF-5: The Commission should discuss this matter with the Single Sky Committee and recall the importance of defining ambitious targets to drive ANSPs' behaviours in order avoid monopolistic rents both in the COVID-19 recovery phase and in subsequent period.[20]

169 Conclusion 6: During RP2, 2B€$_{2009}$ of ANSPs' additional revenues have been subject to the traffic risk sharing mechanism. It is not clear if the traffic risk sharing is calibrated in order to properly incentivise ANSPs behaviours. This became evident in 2020 during the COVID-19 crisis.

CEF-6: The Commission should review the effectiveness of the traffic risk sharing mechanism.

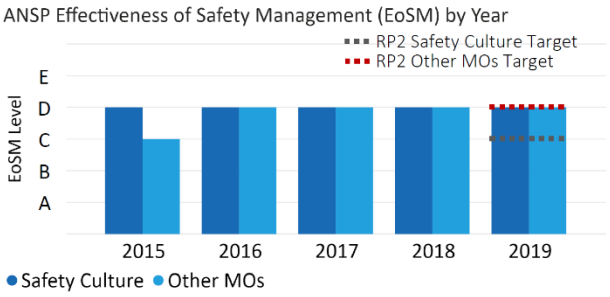
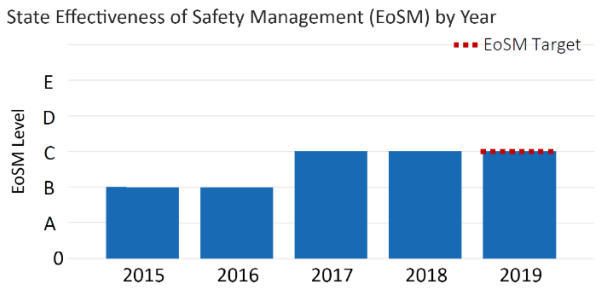
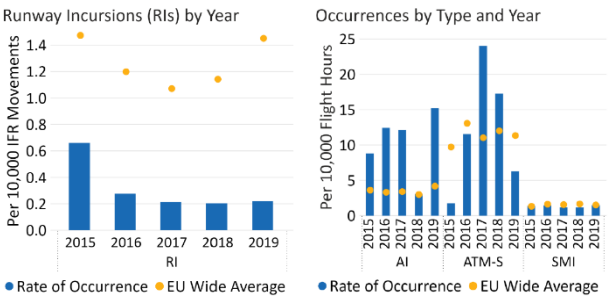
[20] Monopoly rent refers to the situation wherein a monopoly producer lacks competition and thus can sell its goods and services at a price far above the otherwise competitive market price would be, at the expense of consumers.

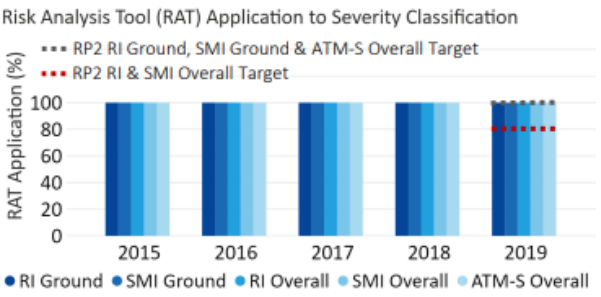
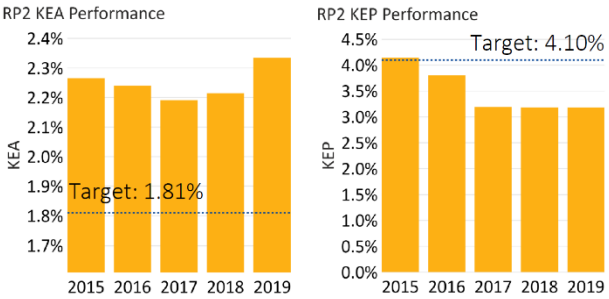
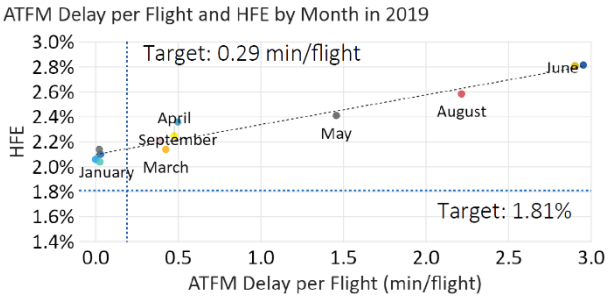
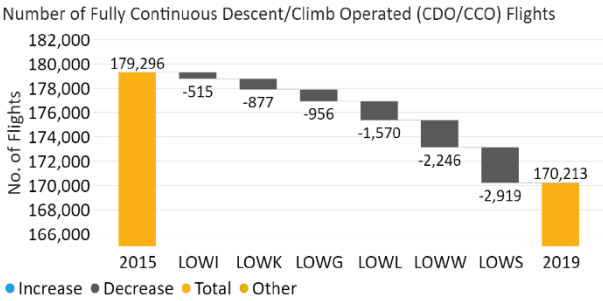
9 Member States' Factsheet

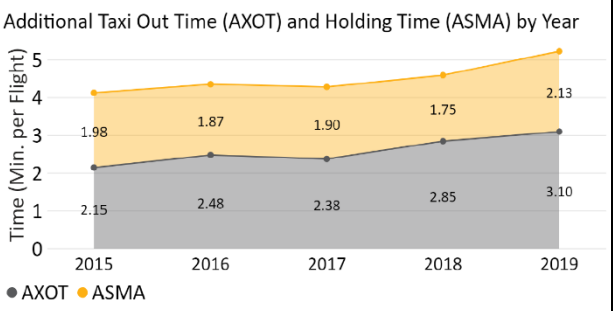
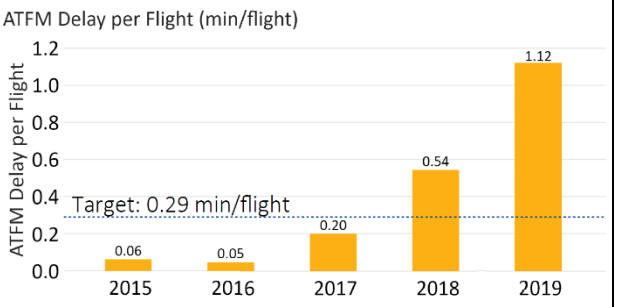
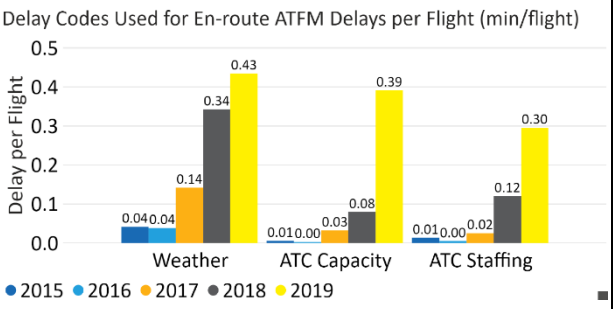
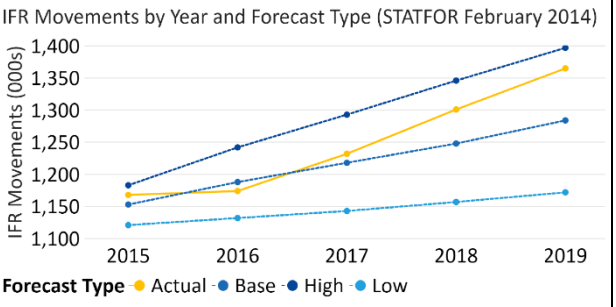
170 This section aims to provide readers with a snapshot of 2019 en route performance in each Member State through factsheets that summarise key data into concise charts and provide PRB commentary on observed performances.

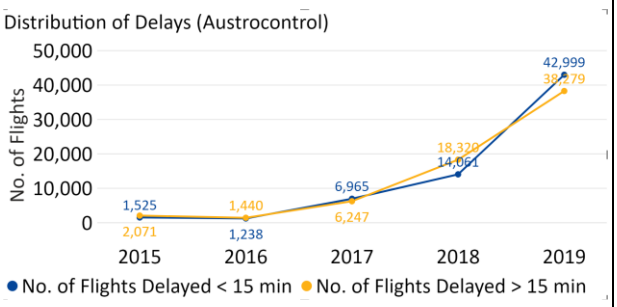
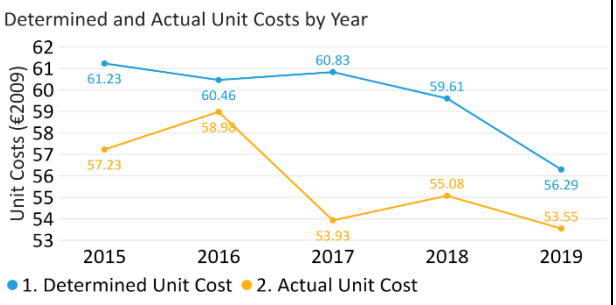
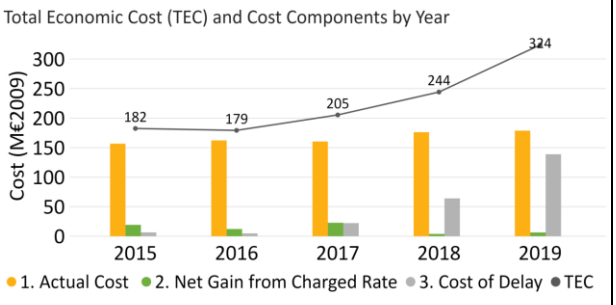
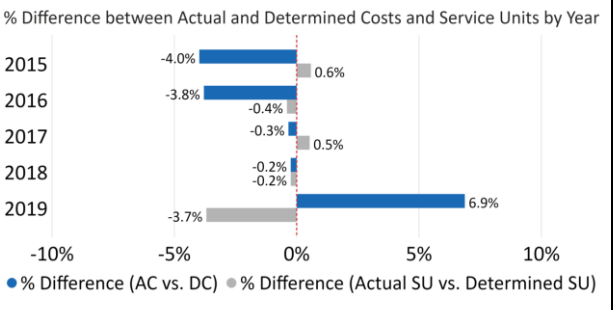
171 The factsheets comprise of three pages, the first page provides comments from the PRB on the observed performance in each Member State per KPA and is based on the charts shown on the second and third page.

172 The charts shown on the second and third page are split into four sections, one for each KPA and each one has a factual caption that describes what it is showing.

KPA	Chart	Description
Safety		Shows the minimum level of EoSM achieved by the Member State's ANSP. The safety culture Management Objective is differentiated from the other Management Objectives. The dotted grey and red lines shows the targets in 2019.
Safety		Shows the minimum level of EoSM achieved by the Member States. The dotted red line shows the target in 2019.
Safety		Shows the rates of occurrence of runway incursions (RIs), airspace infringements (AIs), ATM-S and separation minima infringements (SMIs) for the Member State. The yellow dots show the Union-wide average rates of occurrences for each occurrence type.

Safety		Shows the application of the Risk Analysis Tool (RAT) to severity classification of occurrences. Blank columns indicate that the were no applicable occurrences to apply the RAT. Zero scores or the lack of data is marked separately.
Environment		Shows the achieved horizontal flight inefficiency (KEA) and planned horizontal flight inefficiency (KEP) by the Member State. The dotted lines show the FAB reference value.
Environment		Shows the monthly interdependency between ATFM delays and horizontal flight efficiency in 2019. The dotted vertical line shows the capacity target and the horizontal dotted line shows the KEA reference value.
Environment		Shows the number of flights that conducted fully continuous climb/descent operations (as defined by the Eurocontrol taskforce on vertical flight efficiency) at the Member States' regulated airports.

Environment		Shows the average additional time to taxi-out and additional holding time spent by airspace users at airports that reported data.
Capacity		Shows the average en route ATFM delay incurred per flight in each year of RP2 by airspace users flying in the Member State's airspace. The blue dotted line indicates the capacity target (either national if applicable or the FAB reference value).
Capacity		Delay reasons given by the ANSP. The top three reasons are shown.
Capacity		Shows the actual number of instrument flight rules (IFR) movements managed by the Member State in relation to the high, base and low forecasts from the STATFOR 2014 February forecast.

Capacity		Number of flights delayed more than and less than 15 minutes.
Cost Efficiency		Actual unit cost compared to the determined (planned) unit cost. Costs are expressed in 2009 Euros.
Cost Efficiency		Total economic costs that airspace users (airlines) incur for using a Member State's airspace. Costs are expressed in 2009 Euros. See section 7.4.2 for the definition of the total economic cost.
Cost Efficiency		Difference between actual costs and service units and the planned costs and service units.

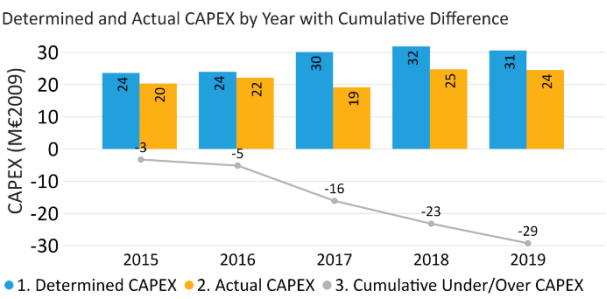
Cost Efficiency		Determined (planned) CAPEX and the actual CAPEX. The grey line shows the cumulative over/underspent CAPEX.

Table 9 – Explanation of each of the figures used in the Member State factsheets.

Comments from the Performance Review Body:

Safety:

- Austria and Austro Control achieved the required level of safety in all Management Objectives.
- Austria and Austro Control achieved the Risk Analysis Tool application target since 2015.
- The number of Separation Minima Infringement (SMI), Airspace Infringement (AI) and Air Traffic Management Specific (ATM-S) per flight hour increased in 2019 relative to 2015.

Environment:

- Austria did not contribute positively towards FAB CE's actual horizontal flight efficiency environment targets (KEA) in any year of RP2 although the planned horizontal flight efficiency (KEP) targets were achieved from 2016 onwards.
- Weather, capacity bottlenecks in western Europe and airspace users opting for cheaper routes were cited by the NSA as causes for the underperformance. However, the targets were not met in any month—even when there were minimal delays in Austria and when other FAB CE members could perform better.
- KEA and en route delays show a correlation of +0.2% per minute of delay in Austria, which suggests improving capacity could improve environmental performance.
- Terminal vertical flight efficiency did not improve as fewer flights completed fully continuous climb/descent at Austrian airports in 2019 compared to 2015.
- On average, airspace users spent 5.23 additional minutes per flight taxiing out or in terminal airspace in 2019. Only one out of six regulated Austrian airports provided data, so the full situation is not clear.

Capacity:

- Austria did not contribute positively towards FAB CE's en route ATFM delay per flight target in 2019. It missed the target for the second consecutive year since 2018.
- Traffic growth gradually shifted between 2017 and 2019 towards the STATFOR high scenario. In 2019, the traffic growth was 5%, which corresponded to an increase of 107% in total delays.
- As in 2018, weather remained the most driving factor behind the delays in 2019, but ATC capacity and staffing issues also emerged.
- The proportion of flights that were delayed by more than 15 minutes decreased compared to 2018 in 2019 and was 47% of all delayed flights.

Cost-efficiency:

- Austria achieved the en route cost-efficiency target in 2019, with the actual unit cost (53.55€$_{2009}$) being lower than the determined unit cost (56.29€$_{2009}$). Austria achieved the en route cost-efficiency targets in each year of RP2.
- In 2019, en route actual costs were above the determined costs by +5.4%. The difference was mainly due to staff costs that have been impacted by changed actuarial parameters (part of them not cost-exempt) and higher than planned service units.
- En route actual costs show an increase over the period, especially from 2018.
- In 2019, Austria underspent –6M€$_{2009}$ in CAPEX (-29M€$_{2009}$ over RP2). Considering the level of delays produced in 2018 and 2019, investments are paramount to ensure improved performance.
- As a result of the underinvestment, in 2019 Austria charged +2.2M€$_{2009}$ (+7.3M€$_{2009}$ over RP2) in cost of capital and depreciation for investments not materialised. Austria should take into account these amounts when developing the RP3 performance plan.

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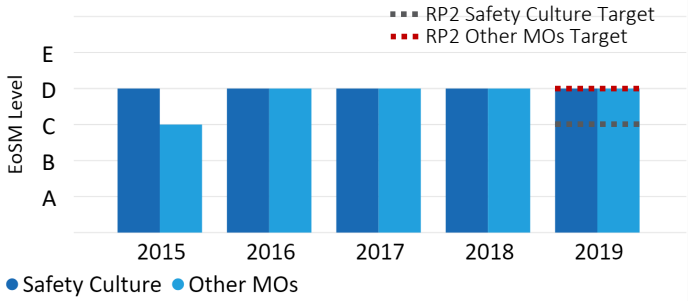
Austria Factsheet

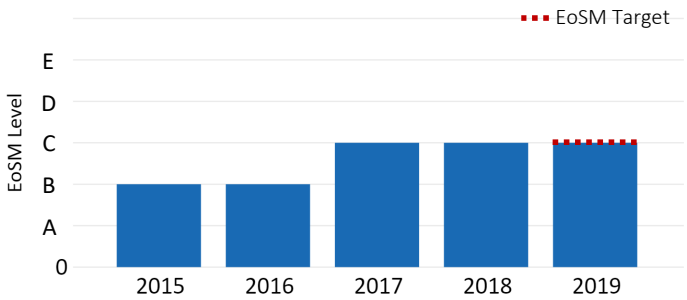
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



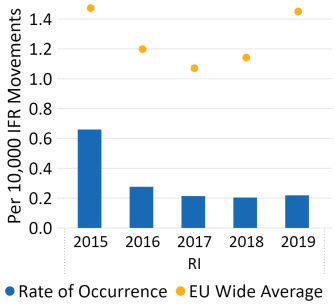
Austro Control has achieved the targets for the EoSM in all management objectives since 2016.

State Effectiveness of Safety Management (EoSM) by Year

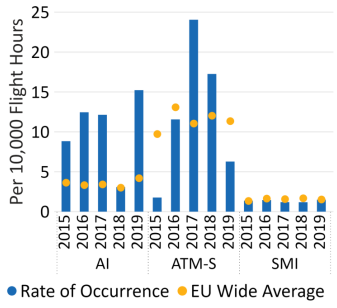


Austria has achieved the targets for the EoSM in all management objectives since 2017.

Runway Incursions (RIs) by Year

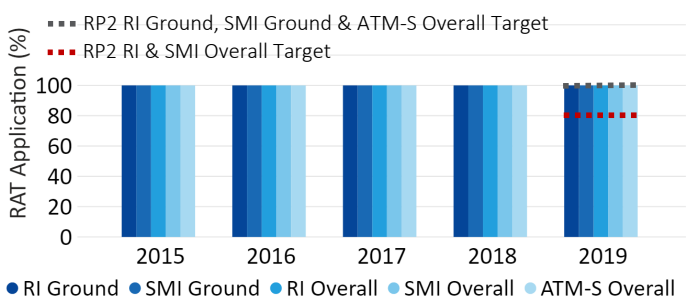


Occurrences by Type and Year



Between 2018 and 2019, RIs, AIs and SMIs have increased. RIs are the only occurrence that has improved in 2019 relative to 2015.

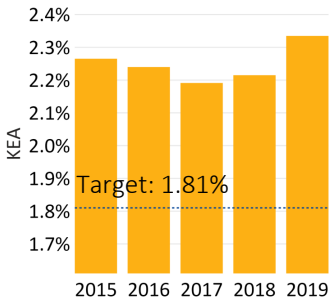
Risk Analysis Tool (RAT) Application to Severity Classification



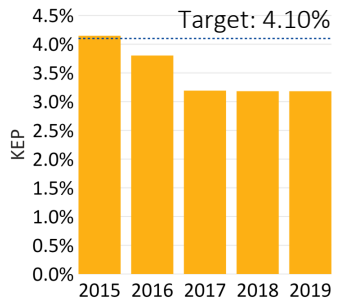
In 2019, Austria and Austro Control achieved the targets for the application of the RAT to severity classification.

Environment

RP2 KEA Performance

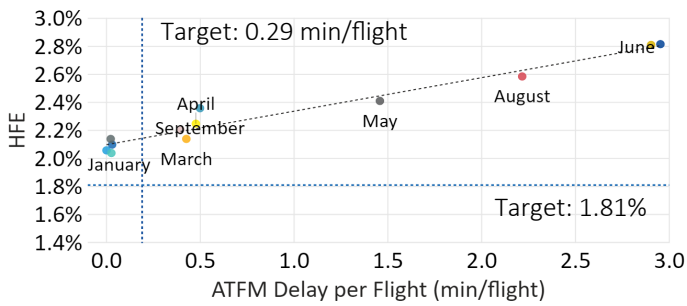


RP2 KEP Performance



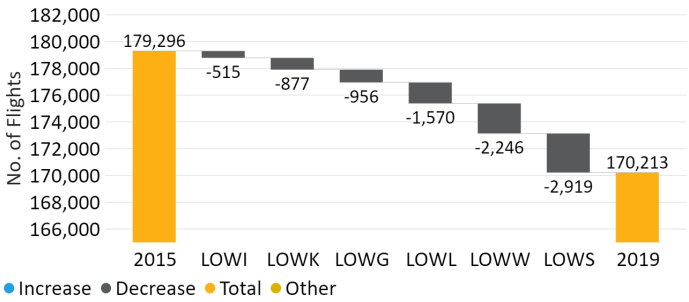
Austria achieved its worst KEA during RP2 in 2019. The KEP target was achieved in 2016 and in every year thereafter.

ATFM Delay per Flight and HFE by Month in 2019



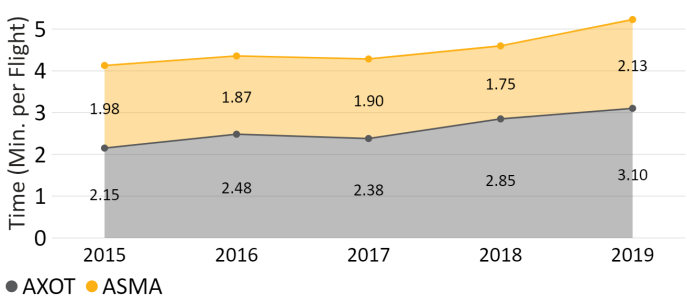
Each minute of additional en route ATFM delay per flight in 2019 correlated with a circa 0.2% increase in HFE.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations fell at regulated airports (led by LOWS) during RP2 by 9,083 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



In 2019, 5.23 minutes of AXOT and ASMA were endured by airspace users in Austria (1/6 regulated airports reported data).

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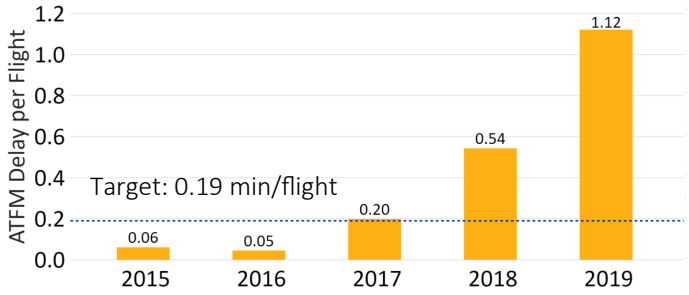
Austria Factsheet

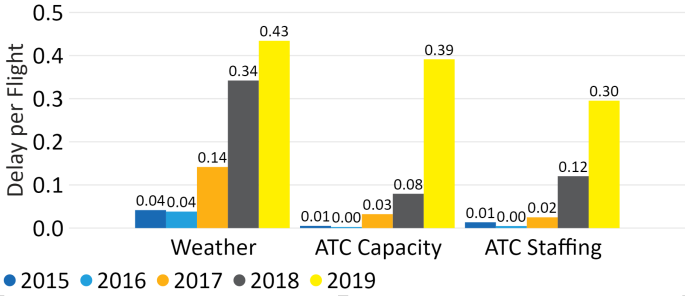
Capacity

ATFM Delay per Flight (min/flight)



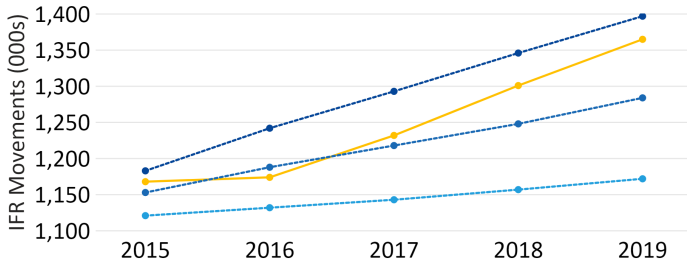
Delays in Austria increased year-on-year by 107% in 2019. Austria did not achieve the targets in 2018 or 2019.

Delay Codes Used for En-route ATFM Delays per Flight (min/flight)



Weather, staffing and ATC capacity were the leading delay reasons contributing 38%, 35% and 27% of 2019 delays respectively.

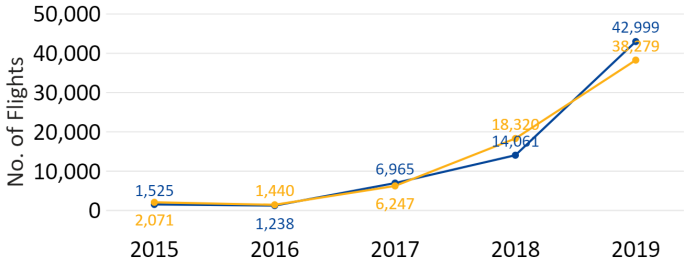
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were 6% above the STATFOR February 2014 base forecast and remained below the high forecast.

Distribution of Delays (Austrocontrol)

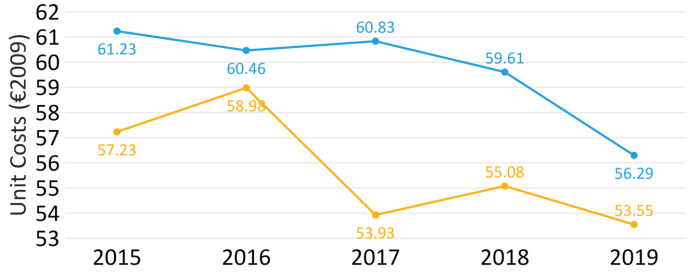


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

Austro Control delayed 38,279 flights by more than 15 minutes in 2019, which was 47% of all delayed flights.

Cost-efficiency

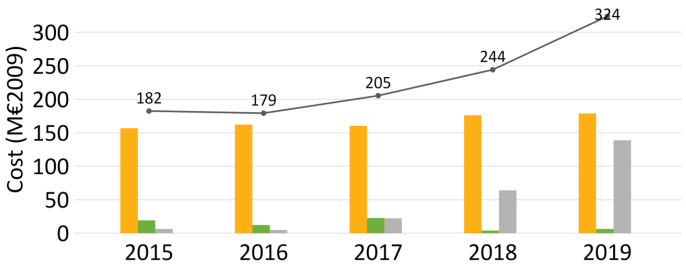
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower than planned in each year of RP2. In 2019, actual unit costs were 5% lower than planned.

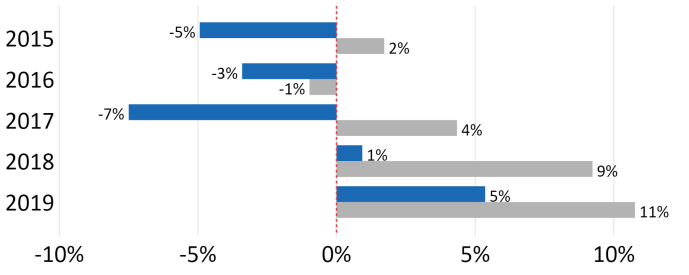
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Austria increased in 2019 (+33%).

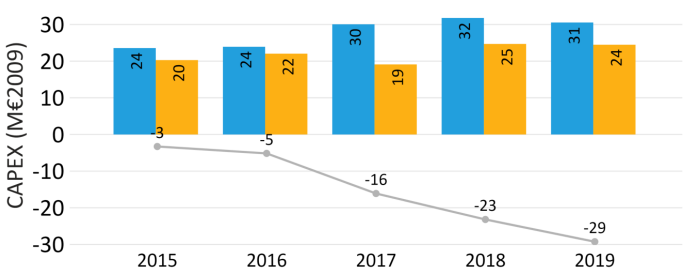
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Lower actual unit costs were fuelled by higher service units in 2019. *

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Austria spent 29M€ less than planned on CAPEX projects during RP2.

*This figure was updated in edition 2.0 of this document

Comments from the Performance Review Body:

Safety (Belgium):

- Belgium achieved the target level in all Management Objectives in 2019.
- Skeyes achieved the target level for safety culture in 2015 and for other Management Objectives in 2017.
- Belgium and skeyes have achieved the RP2 targets for the application of the Risk Classification Scheme since 2015.
- Except for Airspace Infringements (AIs), the number of occurrences has decreased relative to 2015. AIs increased marginally.

Safety (Luxembourg):

- Luxembourg did not achieve the target level for the Effectiveness of Safety Management (EoSM) in 2019.
- ANA LUX achieved the target level for safety culture in 2015 and for other Management Objectives in 2019.
- ANA LUX and Luxembourg had no Runway Incursion (RIs) to report for 2019. Risk Analysis Tool (RAT) targets for other occurrence types were achieved in 2019.
- Occurrences reported show Air Traffic Management Specific (ATM-S) occurrences were higher than the Union-wide average in 2019. Other occurrence types were below Union-wide average in 2019.

Environment (Belgium and Luxembourg):

- Belgium did not contribute positively towards FABEC's actual horizontal flight efficiency environment targets (KEA) in any year of RP2. Planned horizontal flight efficiency (KEP) target was not achieved either for the whole RP2 period.
- FABEC claimed that increased traffic negatively influenced environmental performance; however, Belgium managed fewer instrument flight rules (IFR) movements than in 2018, yet its performance did not improve.
- KEA and en route delays showed a correlation of +0.2% per minute of delay in Belgium, which suggests improving capacity could improve environmental performance.
- Terminal vertical flight efficiency did not improve as fewer flights completed fully continuous climb/descent at Belgian airports in 2019 compared to 2015, although some specific airports did improve.
- On average, airspace users spent 2.86 additional minutes per flight taxiing out or in terminal airspace. Only one out of five regulated Belgian airports provided data, so the full situation is not clear.

Capacity (Belgium and Luxembourg):

- Belgium and Luxembourg did not contribute positively towards FABEC's en route ATFM delay per flight targets in 2019, or during any year of RP2 as it did not achieve its national capacity target.
- Traffic fell in 2019 to below the STATFOR base forecast, which corresponded with a 31% reduction in ATFM delays.
- Average en route ATFM delay per flight was 0.61 minute per flight in 2019. Staffing was the main delay cause in 2019 with a lack of resources to open all required sectors identified as a reason.
- The proportion of flights that were delayed by more than 15 minutes increased in 2019 and was 41% of all delayed flights.

Comments from the Performance Review Body:

Cost Efficiency (Belgium and Luxembourg):

- Belgium and Luxembourg did not achieve the en route cost-efficiency target in 2019, with the actual unit cost (63.67€$_{2009}$) being +11% (+6.30€$_{2009}$) higher than the determined unit cost (57.37€$_{2009}$). It is the only year of RP2 in which Belgium and Luxembourg did not achieve the en route cost-efficiency targets.
- In 2019, en route actual costs were greatly above the determined costs by +6.9%. The difference was mainly due to skeyes 'other' operating costs being almost +200% than planned. The explanation provided in the additional information refers to "*temporary reinforcement of staff, for project management and transformation*". However, this explanation was provided since 2016 and, therefore, the measures cannot be considered temporary any longer.
- Belgium underspent -5M€$_{2009}$ in CAPEX (-23M€$_{2009}$ over RP2). The amounts account for 30% of the planned investments. Investments are paramount for Belgium, considering that capacity targets have not been met in any year of RP2.
- As a result of the underinvestment, in 2019 Belgium charged +3.8M€$_{2009}$ (+18.5M€$_{2009}$ over RP2) in cost of capital and depreciation for investments not materialised. Belgium should take into accounts these amounts when developing the RP3 performance plan.

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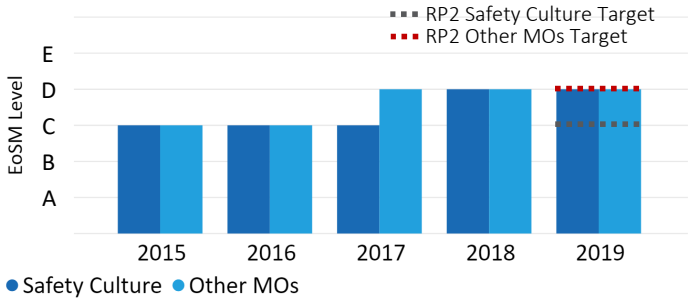
Belgium and Luxembourg Factsheet

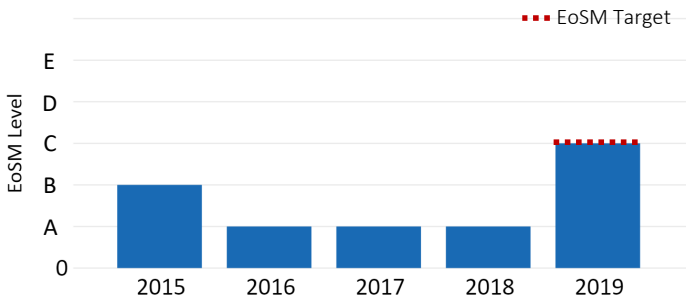
Safety (Belgium)

ANSP Effectiveness of Safety Management (EoSM) by Year



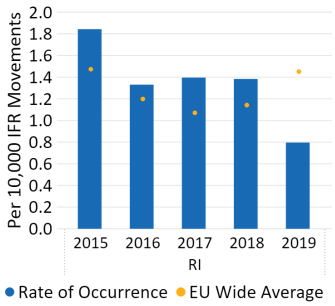
Skeyes has achieved the targets for the EoSM in all safety areas since 2017.

State Effectiveness of Safety Management (EoSM) by Year

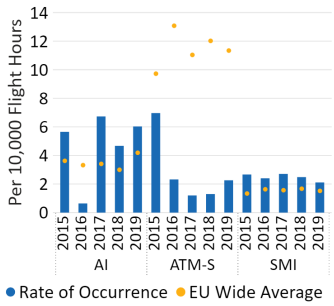


Belgium achieved the targets for the EoSM in all safety areas in 2019.

Runway Incursions (RIs) by Year

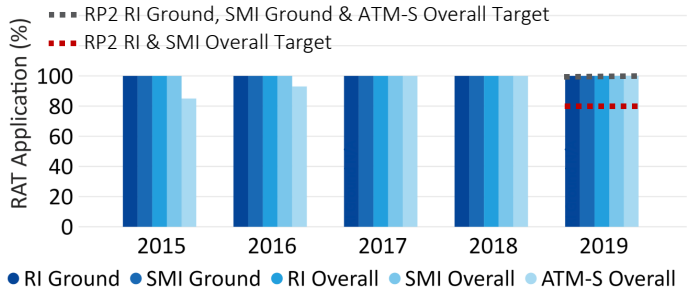


Occurrences by Type and Year



Between 2018 and 2019, rate of AIs and ATM-S' have increased. Rate of RIs and SMIs have improved in 2019.

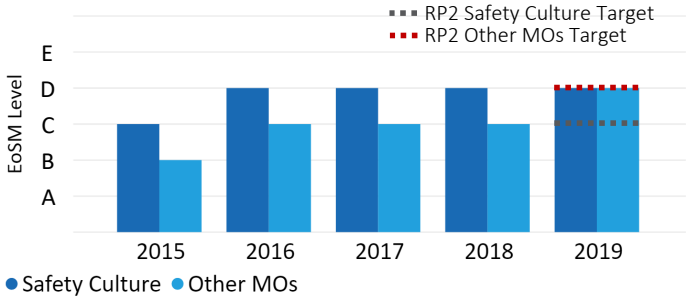
Risk Analysis Tool (RAT) Application to Severity Classification



In 2019, skeyes and Belgium achieved the targets for the application of the RAT to severity classification.

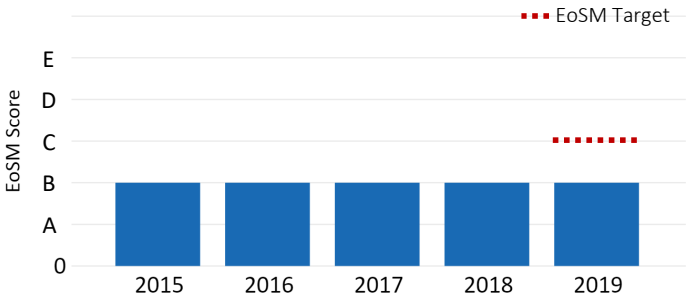
Safety (Luxembourg)

ANSP Effectiveness of Safety Management (EoSM) by Year



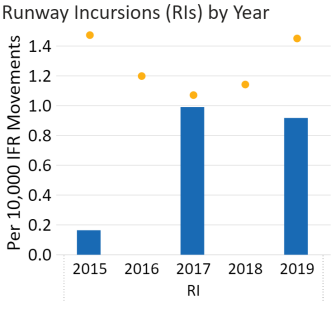
ANA LUX achieved the targets for the EoSM in all other MOs in 2019. The safety culture target was achieved since 2015.

State Effectiveness of Safety Management (EoSM) by Year

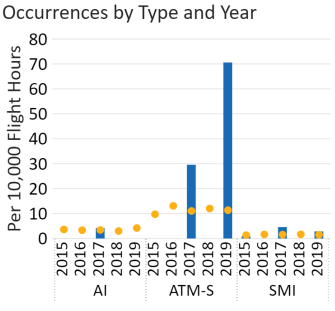


Luxembourg did not achieve the targets for the EoSM in 2019 and it has not improved the level in any year of RP2.

Runway Incursions (RIs) by Year

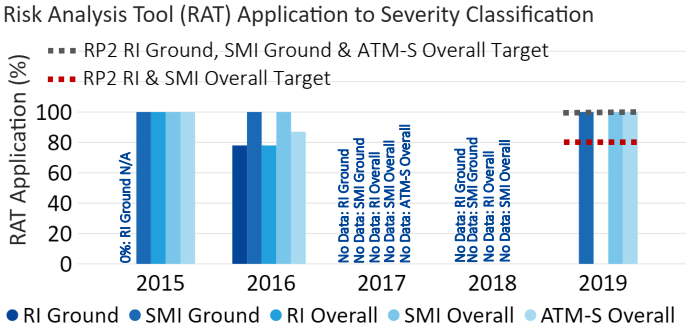


Occurrences by Type and Year



ATM-S occurrences increased above the Union-wide average in 2019.

Risk Analysis Tool (RAT) Application to Severity Classification



In 2019, ANA LUX and Luxembourg had no RIs to report. Targets for SMI ground, SMI overall and ATM specific were achieved.

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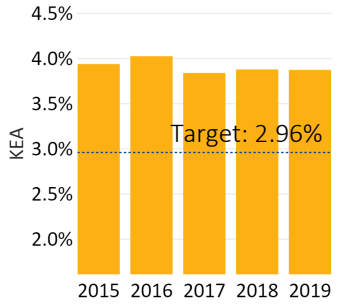
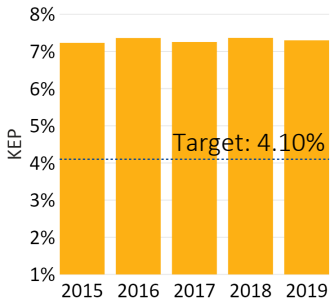
Belgium and Luxembourg Factsheet

Environment

RP2 KEA Performance

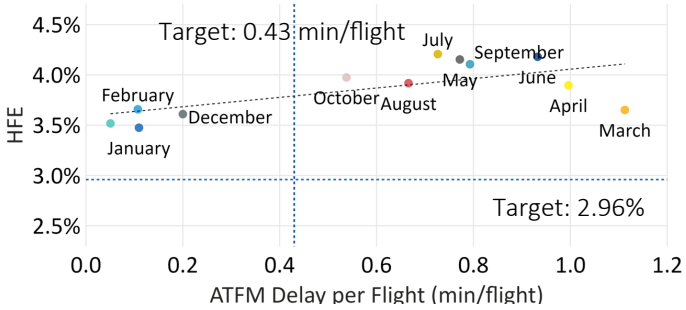


RP2 KEP Performance



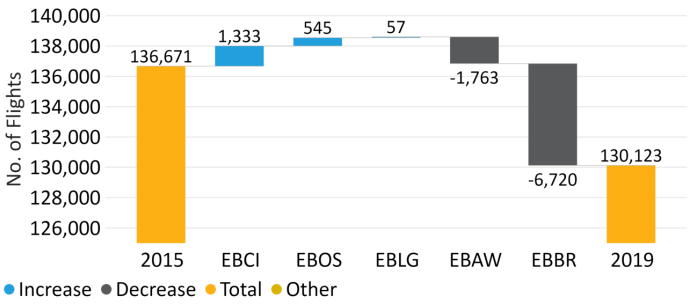
Belgium and Luxembourg missed its KEA targets in each year of RP2. The KEP target was missed in each year of RP2 too.

ATFM Delay per Flight and HFE by Month in 2019



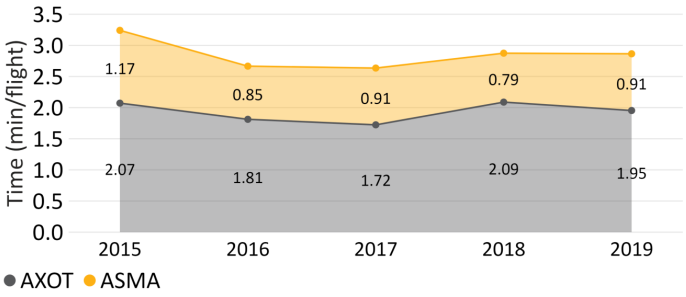
Each minute of additional en route ATFM delay per flight correlated with a circa 0.2% increase in KEA in 2019.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations fell at regulated airports during RP2 by 6,548 flights.

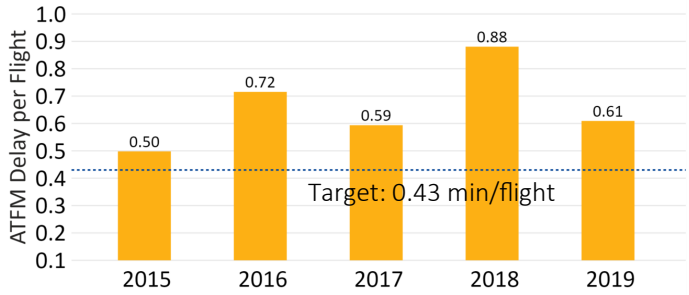
Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



In 2019, 2.86 minutes of additional taxi-out and holding time was spent by airspace users in Belgium and Luxembourg.

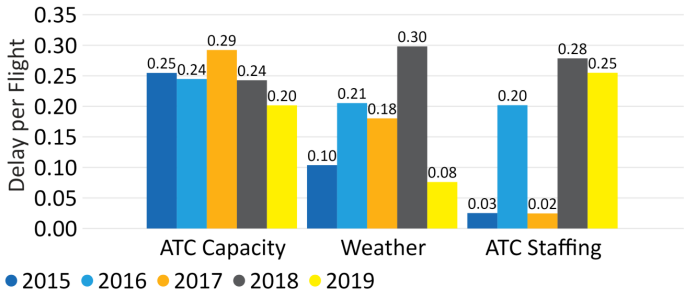
Capacity

ATFM Delay per Flight (min/flight)



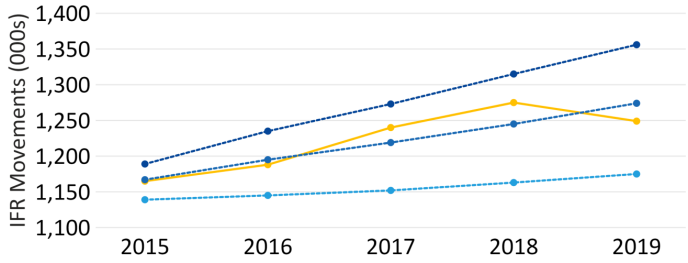
Delays in Belgium & Luxembourg fluctuated during RP2. Belgium & Luxembourg has missed capacity targets in each year of RP2.*

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



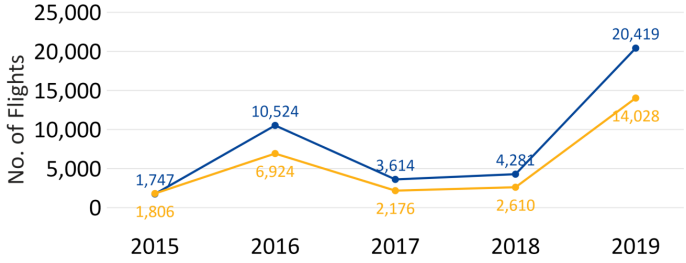
Staffing, ATC capacity and weather were the leading delay reasons contributing 41%, 33% and 13% of the delays respectively.

IFR Movements by Year and Forecast Type (STATFOR February 2014)



IFR movements in 2019 were circa 2% below the STATFOR February 2014 base forecast.

Distribution of Delays (skeyes)



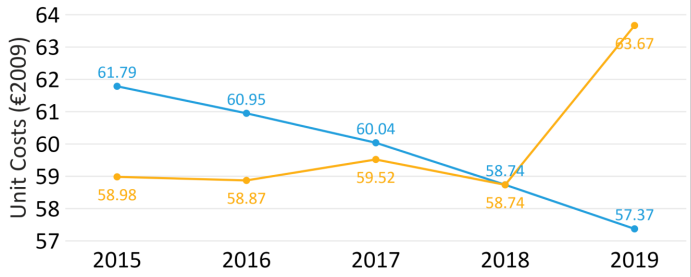
skeyes delayed 14,028 flights by more than 15 minutes in 2019, which was 41% of all delayed flights.

*This figure was updated in edition 2.0 of this document

Belgium and Luxembourg Factsheet

Cost-efficiency

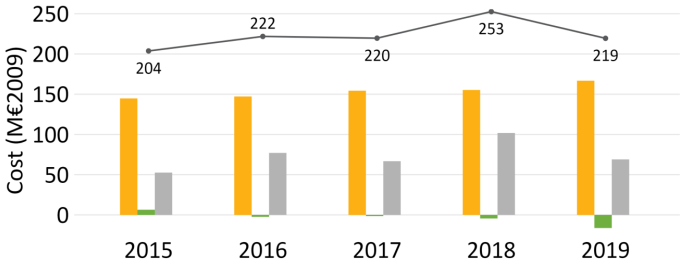
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower than planned between 2015 and 2018. In 2019, actual unit costs were 11% higher than planned.

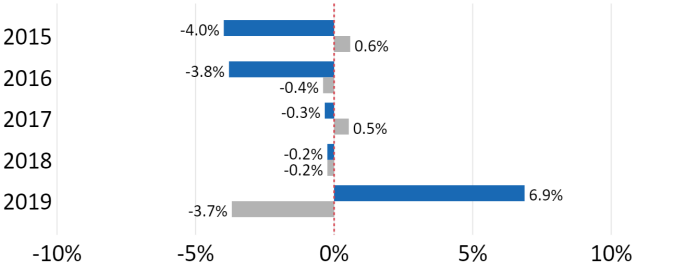
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The total economic cost for airspace users to use air navigation services in Belgium fell in 2019 (-13%).

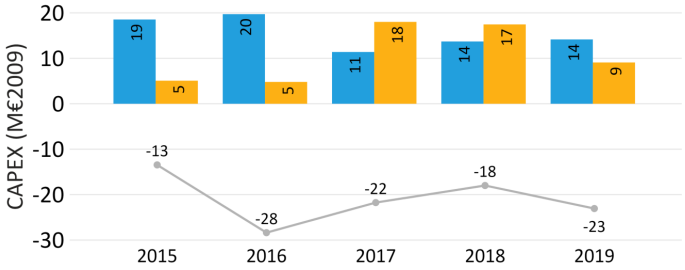
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Higher actual unit costs were fuelled by higher spending and lower than planned service units in 2019.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Belgium spent 23M€ less than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Bulgaria did not achieve the RP2 targets for the Effectiveness of Safety Management (EoSM) in 2019 and has not improved the minimum level since 2015.
- BULATSA exceeded the target level for safety culture already in 2015 and achieved the target for other Management Objectives in 2017.
- Bulgaria and BULATSA have achieved the RP2 targets for the application of the Risk Classification Scheme since the start of RP2 where data was reported and remained on or above the targets since.
- The reported occurrences show the normal fluctuations and were mostly below the Union-wide average rates in 2019 aside from Air Traffic Management Specific (ATM-S) occurrences.

Environment:

- Bulgaria did not contribute positively towards Danube FAB's actual horizontal flight efficiency environment targets (KEA) although the planned horizontal flight efficiency (KEP) targets were achieved.
- Given the significant deterioration in performance during 2019, a detailed analysis using PRU data revealed that CPR and airport reporting from Turkey led to the availability of new information that impacted KEA without significant underlying change in performance.
- Terminal vertical flight efficiency improved as more flights completed fully continuous climb/descent at Sofia airport in 2019 compared to 2015.
- Terminal performance remained stable with no significant improvement in additional taxi-out or holding times. On average, airspace users spent 1.95 additional minutes per flight taxiing out or in terminal airspace in 2019.

Capacity:

- Bulgaria contributed positively towards Danube FAB's en route Air Traffic Flow Management (ATFM) delay per flight target in 2019 and during every year of RP2.
- The number of instrument flight rules (IFR) movements grew by 1% relative to 2018 and was above the STATFOR high growth forecast throughout RP2. The ATFM delay per flight decreased in 2019 and during RP2 in general to remain below the 0.07 minute per flight target.

Cost-efficiency:

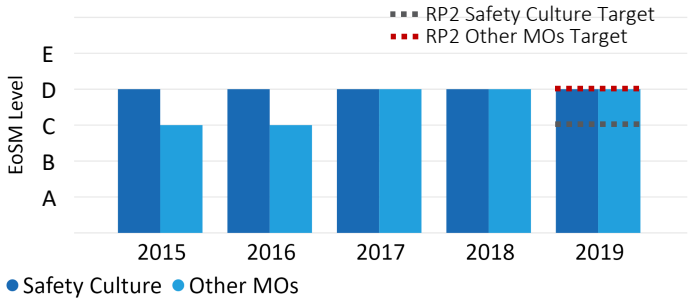
- Bulgaria achieved the en route cost-efficiency target in 2019, with the actual unit cost (25.38€$_{2009}$) being lower than the determined unit cost (28.99€$_{2009}$). Bulgaria, which revised its performance plan in 2017, achieved the en route cost-efficiency targets in each year of RP2.
- In 2019, en route actual costs were below the determined costs by -5.8%. The main reason is lower than planned staff cost caused by a delay in the "*accrual and acquisition of human resources*" as well as lower than expected social security costs.
- In 2019, Bulgaria underspent -1M€$_{2009}$ in CAPEX (-20M€$_{2009}$ over RP2). Bulgaria has consistently underspent in RP2 with the only exception being 2015.
- As a result of the underinvestment, in 2019 Bulgaria charged +3.6M€$_{2009}$ (+14.9M€$_{2009}$ over RP2) in cost of capital and depreciation for investments not materialised. Bulgaria should take into account these amounts when developing the RP3 performance plan.

PRB Performance review body of the single european sky

Bulgaria Factsheet

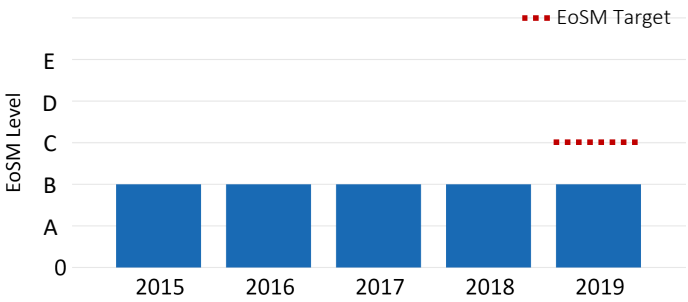
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



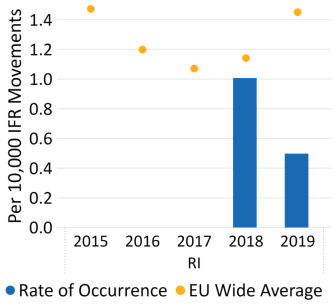
BULATSA has achieved the targets for the EoSM in all Management Objectives since 2017.

State Effectiveness of Safety Management (EoSM) by Year

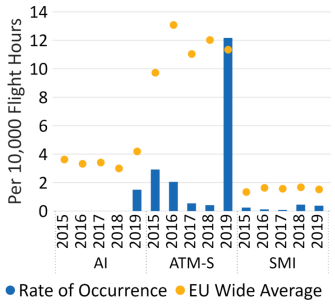


Bulgaria did not achieve the targets for the EoSM in all safety Management Objectives in 2019 and didn't improve in RP2.

Runway Incursions (RIs) by Year

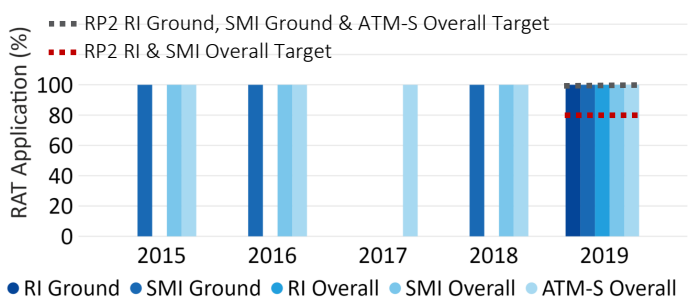


Occurrences by Type and Year



RIs occurred for the first time in 2018 but the rate of occurrence reduced in 2019. Rates of ATM-S occurrences increased in 2019.

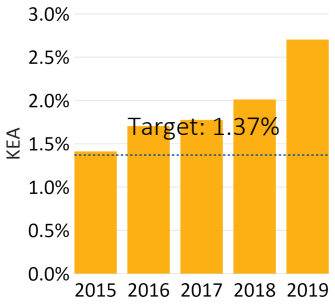
Risk Analysis Tool (RAT) Application to Severity Classification



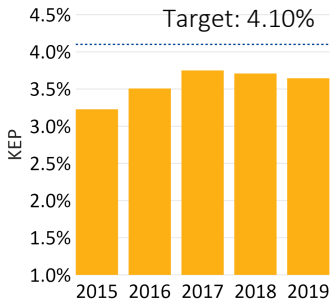
In 2019, BULATSA and Bulgaria achieved the targets for the application of the RAT to severity classification.

Environment

RP2 KEA Performance

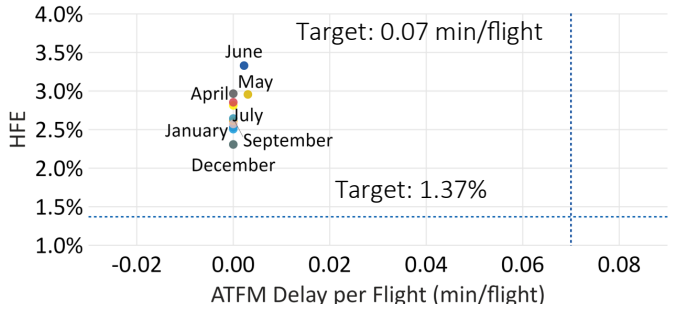


RP2 KEP Performance



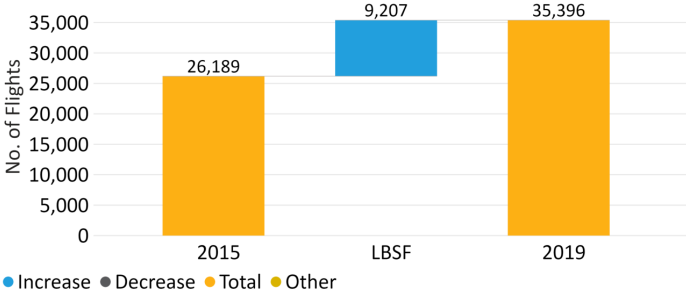
Bulgaria achieved its worst KEA during RP2 in 2019. However, the KEP target was achieved in every year of RP2.

ATFM Delay per Flight and HFE by Month in 2019



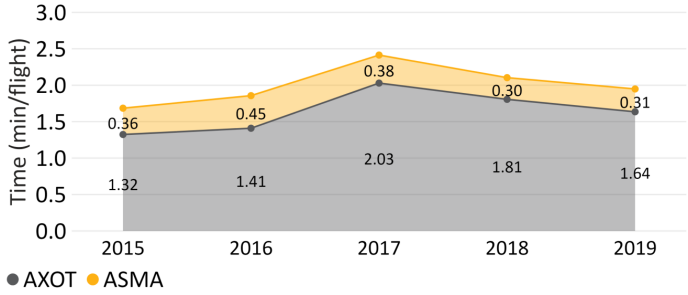
KEA target was missed in each month of 2019, but the capacity target was achieved with almost zero delays.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations increased at regulated airports during RP2 by 9,207 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



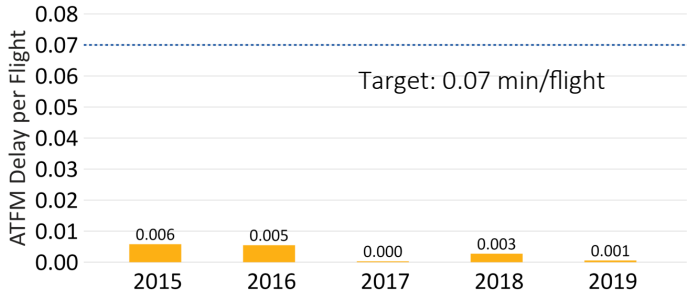
In 2019, 1.95 minutes of additional taxi-out and holding time was spent by airspace users in Bulgaria.

PRB Performance review body of the single european sky

Bulgaria Factsheet

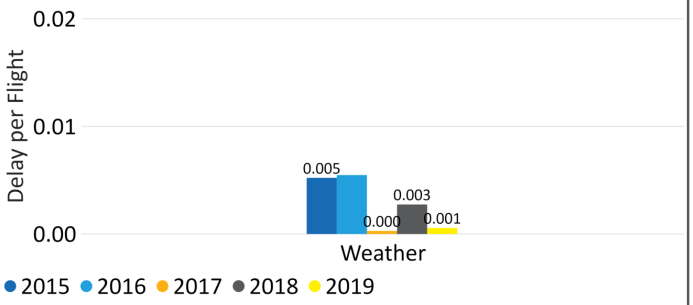
Capacity

ATFM Delay per Flight (min/flight)



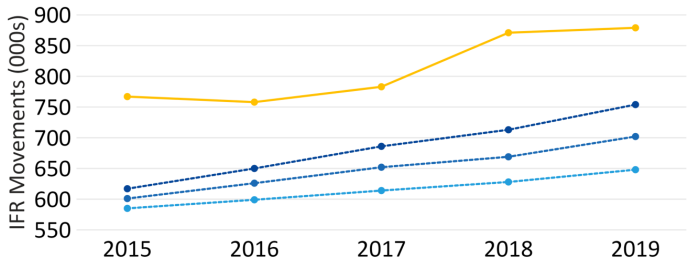
Delays in Bulgaria remained low during RP2. Bulgaria achieved the targets each year or RP2.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



Weather was the leading delay reasons during RP2.

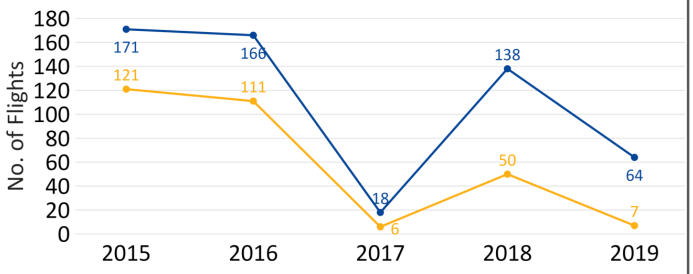
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in RP2 were circa 17% above the STATFOR February 2014 high forecast.

Distribution of Delays (BULATSA)

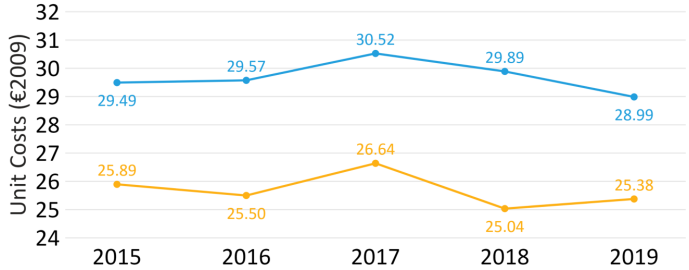


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

BULATSA delayed 7 flights by more than 15 minutes in 2019, which was 10% of all delayed flights.

Cost-efficiency

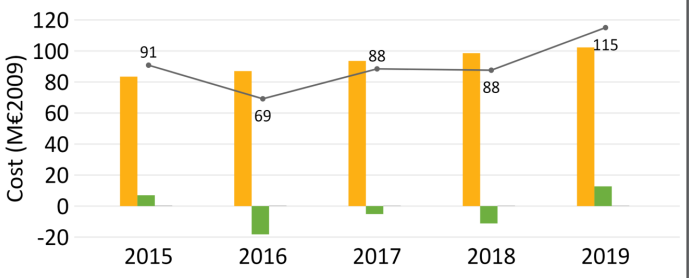
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower in each year of RP2. In 2019, actual unit costs were 12% lower than planned.

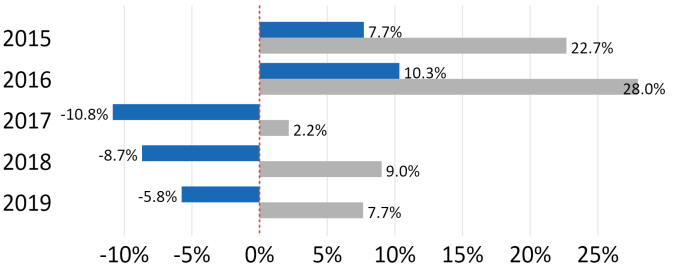
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Bulgaria increased during 2019 (+31%).

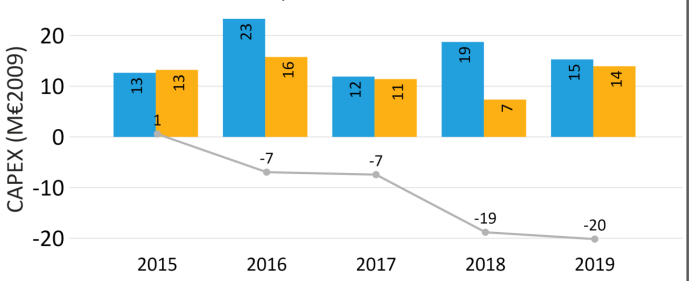
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Lower actual unit costs were fuelled by higher service units in 2015 and 2016, and lower than planned costs helped thereafter.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Bulgaria spent 20M€ less than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Croatia achieved the target level in all Management Objectives in 2019.
- Croatia Control achieved the RP2 target for safety culture in 2015 and for other MOs in 2019.
- Croatia and Croatia Control have achieved the RP2 targets for the application of the Risk Classification Scheme since 2019.
- The reported occurrences show the normal fluctuations and were generally below the Union-wide average rates in 2019. Air Traffic Management Specific (ATM-S) occurrences in 2019 improved but were still above the Union-wide average.

Environment:

- Croatia contributed positively towards FAB CE's actual horizontal flight efficiency environment targets (KEA) in each year of RP2, and the planned horizontal flight efficiency (KEP) targets were achieved from 2015 onwards.
- However, KEA performance has steadily deteriorated and the NSA monitoring report states that this has been caused shifts in traffic flow, adverse weather and non-uniform unit rates.
- KEA and en route delays show a correlation of +0.2% per minute of delay in Croatia, which suggests improving capacity could improve environmental performance.
- Terminal vertical flight efficiency improved as more flights completed fully continuous climb/descent at Zagreb airport in 2019 compared to 2015.
- On average, airspace users spent 1.72 additional minutes per flight taxiing out or in terminal airspace in 2019.

Capacity:

- Croatia did not contribute positively towards FAB CE's en route Air Traffic Flow Management (ATFM) delay per flight target in 2019, as delays increased for the fourth consecutive year.
- The number of instrument flight rules (IFR) movements in 2019 exceeded the STATFOR high growth forecast and the 10% growth in IFR movements resulted in a 25% increase in en route ATFM delay per flight to 0.75 minutes per flight versus the target of 0.19 minutes per flight.
- ATC capacity and weather were the main delay causes in 2019. The implementation of a central sector below FL355 to improve capacity was postponed to 2020 and this did not help the situation.

Cost-efficiency:

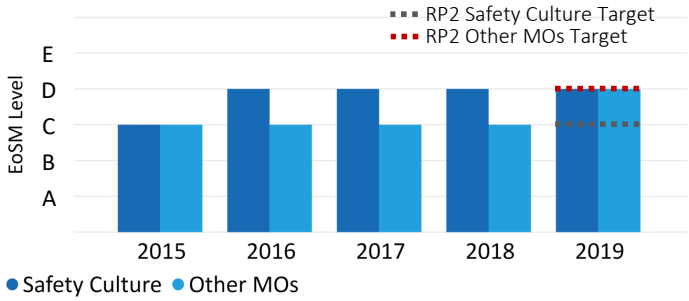
- Croatia achieved the en route cost-efficiency target in 2019 with the actual unit cost (37.00€$_{2009}$) being lower than the determined unit cost (40.53€$_{2009}$). Croatia achieved the en route cost-efficiency targets in each year of RP2.
- In 2019, en route actual costs were above the determined costs by +3.9% due primarily staff costs. This was more than compensated by the increase in service units (+13.8%). Despite this, the en route actual costs remained mostly flat over the period, notably the 2019 actual costs being at the same level of the 2018 ones.
- In 2019, Croatia overinvested +4M€$_{2009}$ in CAPEX (+1M€$_{2009}$ over RP2). Croatia closed the gap generated in the first two years of the period, by catching up with the planned investments.
- Due to the late catching up of CAPEX, Croatia charged +7.2M€$_{2009}$ over RP2 in cost of capital and depreciation for investments not materialised. Croatia should take into accounts these amounts when developing the RP3 performance plan.

PRB Performance review body of the single european sky

Croatia Factsheet

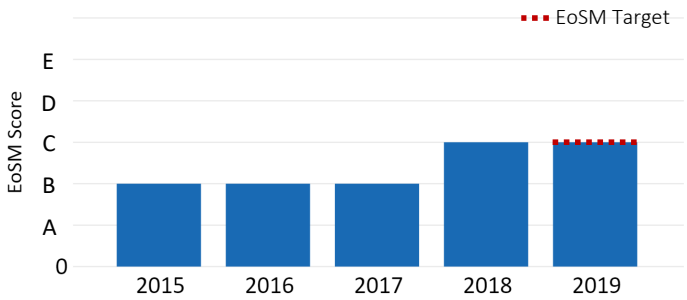
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



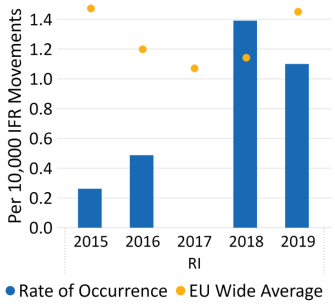
Croatia Control achieved the targets for the EoSM in all Management Objectives in 2019.

State Effectiveness of Safety Management (EoSM) by Year

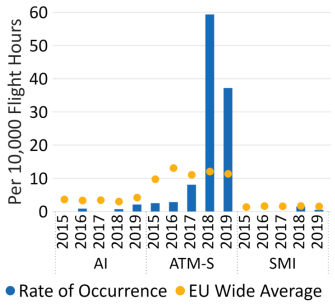


Croatia achieved the targets for the EoSM in all Management Objectives since 2018.

Runway Incursions (RIs) by Year

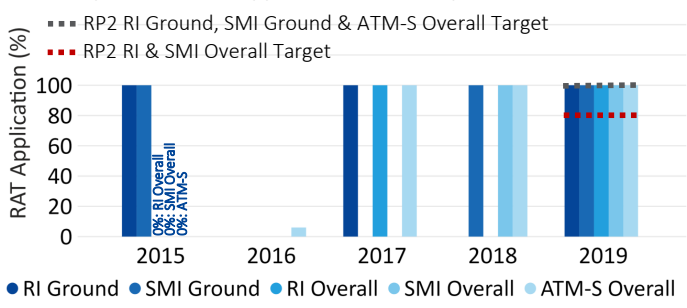


Occurrences by Type and Year



Between 2018 and 2019, AIs have increased. RIs, SMIs and ATM-S occurrences have improved in 2019 relative to 2018.

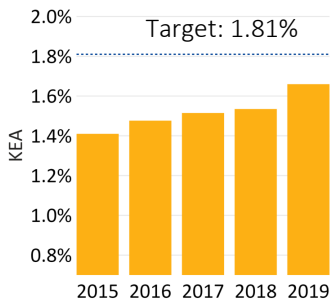
Risk Analysis Tool (RAT) Application to Severity Classification



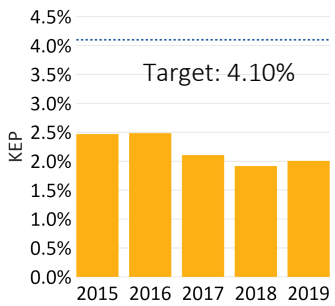
In 2019, Croatia and Croatia Control achieved the targets for the application of the RAT to severity classification.

Environment

RP2 KEA Performance

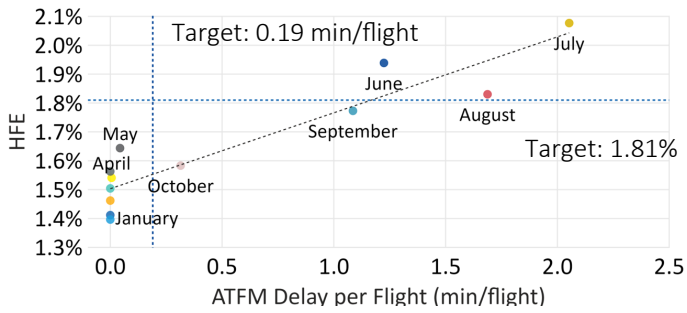


RP2 KEP Performance



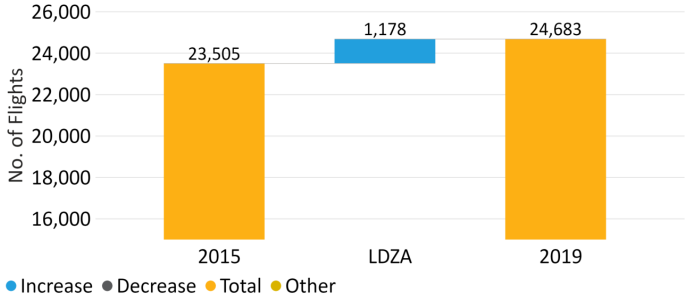
Croatia worsened its KEA in each year of RP2, but still reached the targets. The KEP target was achieved for the whole RP2 period.

ATFM Delay per Flight and HFEby Month in 2019



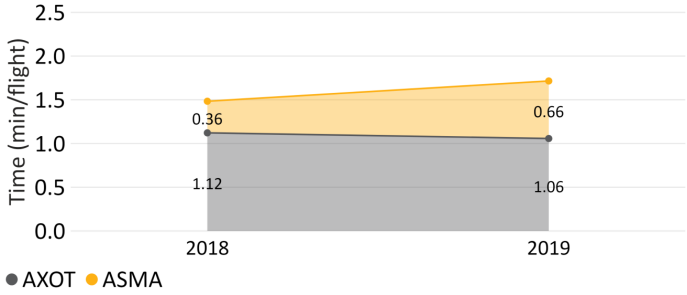
Each minute of additional en route ATFM delay per flight correlated with a circa 0.2% increase in KEA.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations increased at regulated airports during RP2 by 1,178 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



In 2019, 1.72 minutes of AXOT and ASMA was endured by airspace users in Croatia (1/1 regulated airports reported data since 2018).

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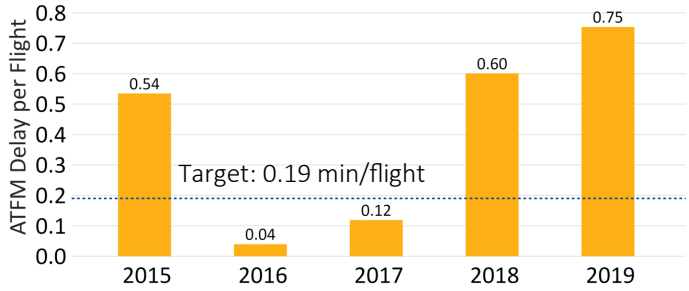
Croatia Factsheet

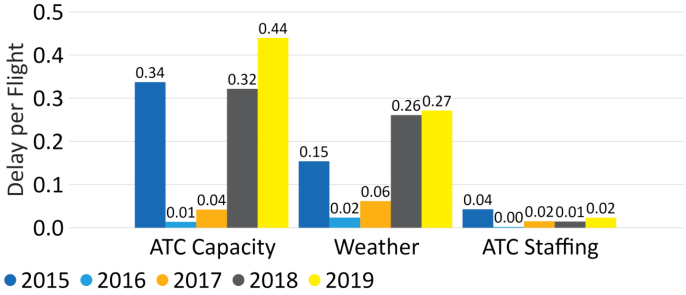
Capacity

ATFM Delay per Flight (min/flight)



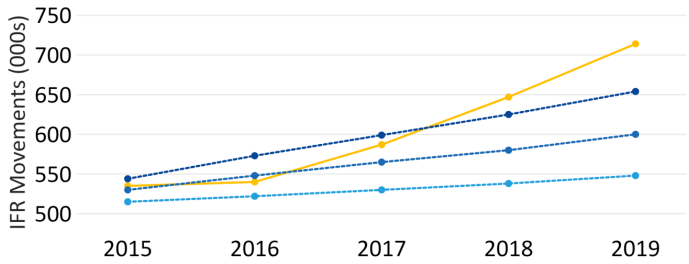
Delays in Croatia have increased since 2016. Subsequently, Croatia did not achieve the targets in 2018 or 2019.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



ATC capacity, weather and staffing were the leading delay reasons contributing 59%, 36% and 3% of the delays respectively.

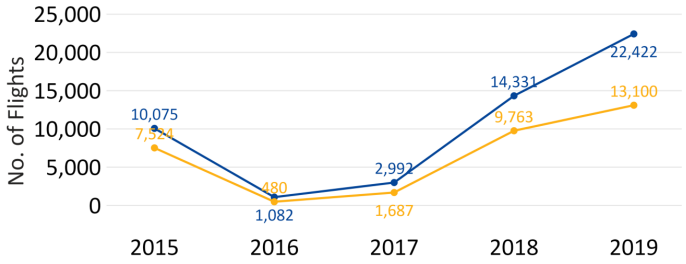
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were circa 9% above the STATFOR February 2014 high forecast.

Distribution of Delays (Croatia Control)

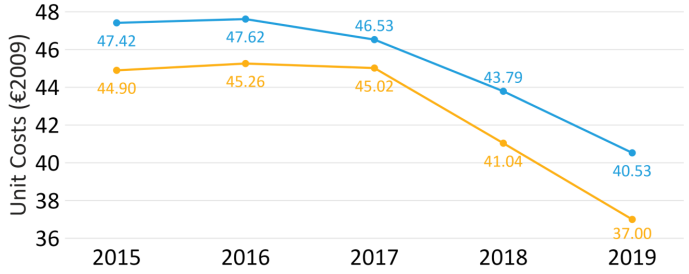


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

Croatia Control delayed 13,100 flights by more than 15 minutes in 2019, which was 37% of all delayed flights.

Cost-efficiency

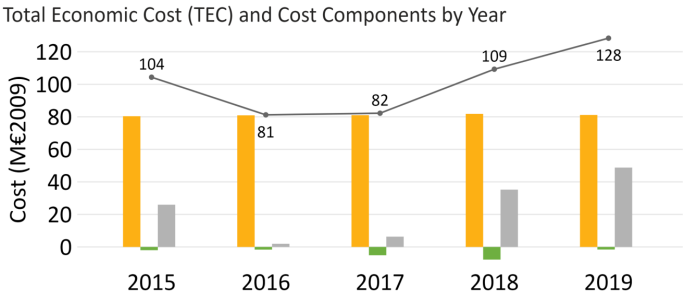
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower in each year of RP2. In 2019, actual unit costs were 9% lower than planned.

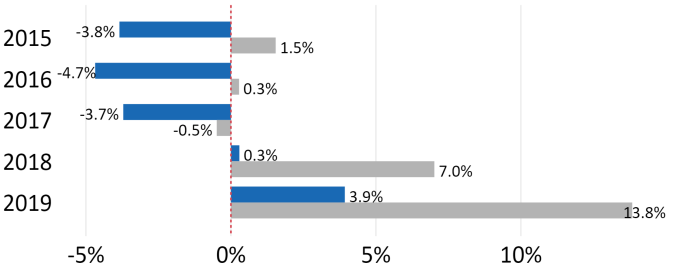
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Croatia increased in 2019 (+17%).

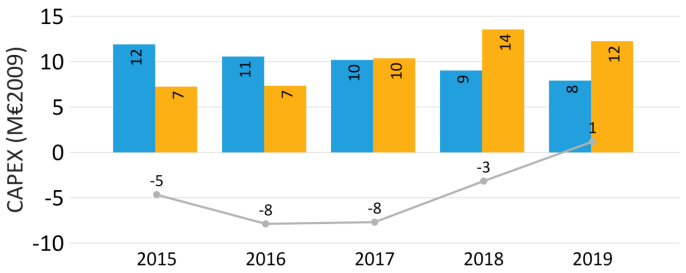
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Lower actual unit costs were fuelled by lower spending between 2015 and 2017 and higher service units thereafter.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Croatia spent 1M€ more than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Cyprus achieved the target level in all Management Objectives in 2018 and 2019.
- CYATS achieved the RP2 target for Safety Culture since 2015 but did not achieve the target for other Management Objectives in 2019.
- CYATS achieved the RP2 targets for the application of the Risk Analysis Tool in 2019. Cyprus did not achieve the targets.
- Occurrences reported show the normal fluctuations and were below the Union-wide average rates in 2019, except for Airspace Infringements (AIs). Level of AIs have improved since a peak in 2016.

Environment:

- Cyprus did not contribute positively towards BLUEMED FAB's actual horizontal flight efficiency environment targets (KEA) since 2016, nor to the planned horizontal flight efficiency (KEP) targets in any year of RP2.
- KEA worsened during 2016 and was coupled with inefficient entry/exit points of airspace users with respect to the great circle distance, possibly due to geopolitical issues.
- KEA and en route delays show a correlation of +0.25% per minute of delay in Cyprus, which suggests improving capacity could improve environmental performance.
- Terminal vertical flight efficiency improved as more flights completed fully continuous climb/descent at Cypriot airports in 2019 compared to 2015.
- However, neither of the two Cypriot airports reported the additional taxi-out times or holding times which the airspace users may have incurred in any year of RP2.

Capacity:

- Cyprus contributed positively towards BLUMED FAB's en route Air Traffic Flow Management (ATFM) delay per flight target in 2019 by achieving its national target.
- The number of instrument flight rules (IFR) movements continued to increase in 2019 reaching circa 5% above the STATFOR February 2014 base forecast. The growth in IFR movements together with realised capacity measures slightly worsened the en route ATFM delay per flight by 7% from 1.10 minutes per flight in 2018 to 1.18 minutes per flight in 2019.
- The main capacity issues were due to staffing issues which caused 48% of total delays followed closely by related ATC capacity (32%) and airspace management (13%) issues.
- The latter could be accounted for due to geopolitical situation in the area. The ATC staffing cause however indicates a worsening trend and an area for improvement.
- The proportion of flights that were delayed by more than 15 minutes in 2019 was 49% of all delayed flights.

Cost-efficiency:

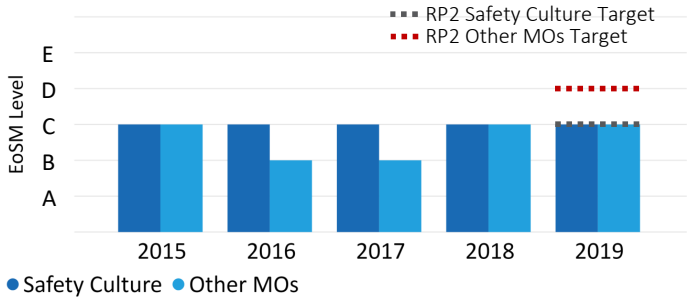
- Cyprus achieved the en route cost-efficiency target in 2019, with the actual unit cost (24.36€$_{2009}$) being lower than the determined unit cost (32.16€$_{2009}$). Cyprus achieved the en route cost-efficiency targets in each year of RP2.
- In 2019, en route actual costs were slightly above the determined costs by +2.9%. The main factor creating the difference is a lower than planned inflation rate. In nominal terms, costs remained below determined in each year of RP2.
- In 2019, Cyprus overspent +1M€$_{2009}$ in CAPEX (while underspending -6M€$_{2009}$ over RP2). Cyprus is catching up with the planned investments since 2018, however the gap with the plans has not been closed during RP2.
- As a result of the underinvestment, in 2019 Cyprus charged +4.2M€$_{2009}$ (-14.4M€$_{2009}$ over RP2) in cost of capital and depreciation for investments not materialised. Cyprus should take into accounts these amounts when developing the RP3 performance plan.

PRB Performance review body of the single european sky

Cyprus Factsheet

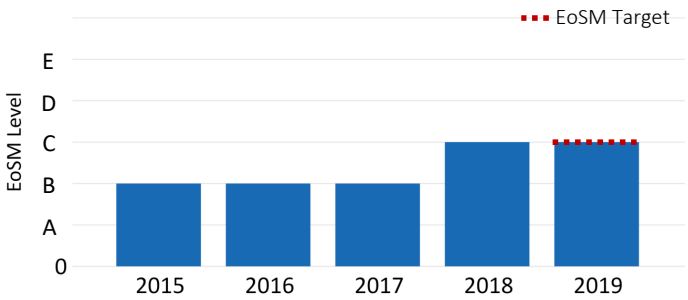
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



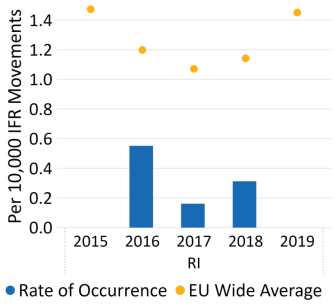
CYATS did achieve the targets for the EoSM in 2019 for safety culture but not the other MOs.

State Effectiveness of Safety Management (EoSM) by Year

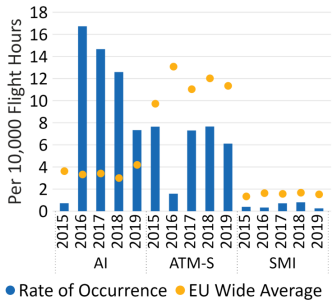


Cyprus achieved the targets for the EoSM in all MOs since 2018.

Runway Incursions (RIs) by Year

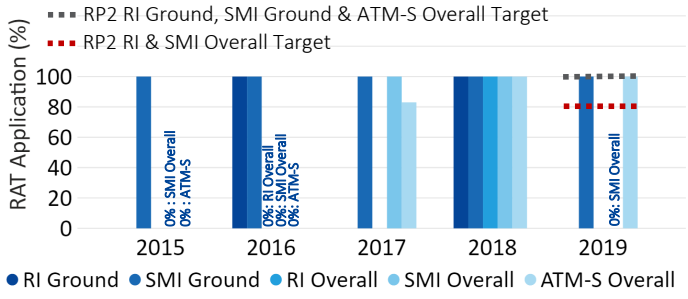


Occurrences by Type and Year



There were no RIs in 2019 and the rate of other occurrence types reduced relative to 2018.

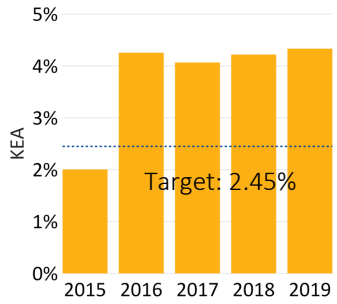
Risk Analysis Tool (RAT) Application to Severity Classification



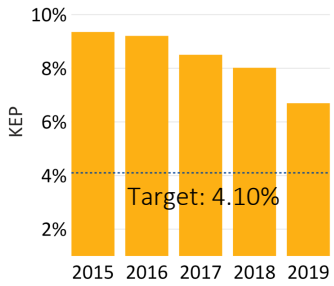
In 2019, Cyprus did not achieve the RAT targets for the application of the RAT to severity classification whereas DCAC did.

Environment

RP2 KEA Performance

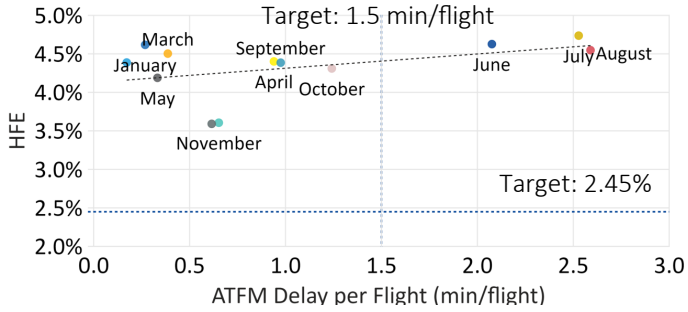


RP2 KEP Performance



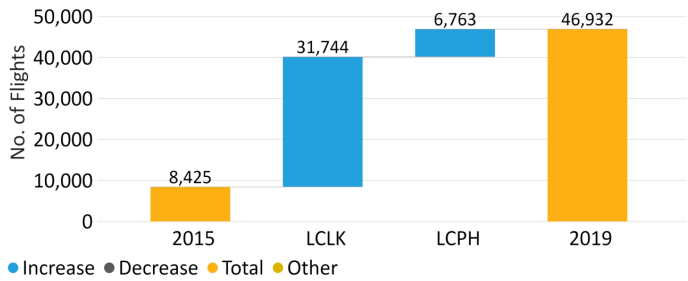
Cyprus has missed the KEA target in each year of RP2 except 2015 and KEP for the whole RP2 period.

ATFM Delay per Flight and HFE by Month in 2019



Each minute of additional en-route ATFM delay per flight correlated with a circa 0.25% increase in KEA.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations increased at regulated airports during RP2 by 38,507 flights.

No data provided for LCLK or LCPH

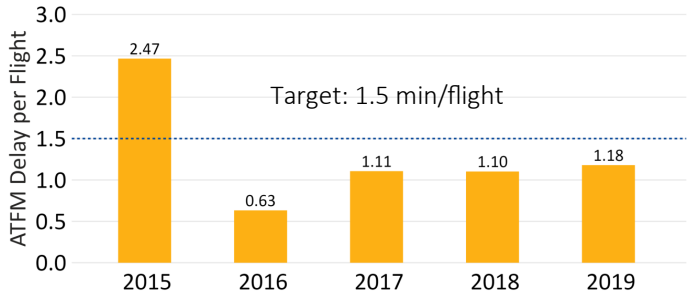
Cyprus did not provide data on Additional Taxi Out Time (AXOT) and Holding Time (ASMA) for any year of RP2.

PRB Performance review body of the single european sky

Cyprus Factsheet

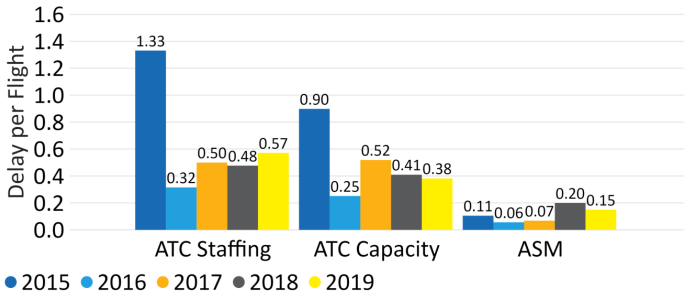
Capacity

ATFM Delay per Flight (min/flight)



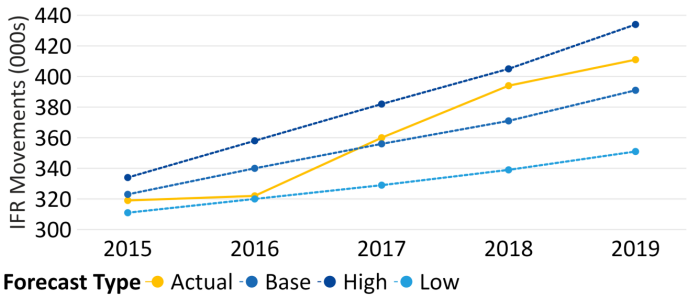
Delays in Cyprus were stable during the last three years of RP2. Capacity targets were achieved from 2016 onwards.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



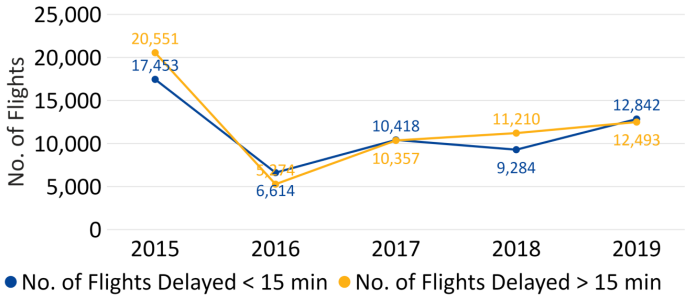
ATC staffing, ATC capacity and ASM were the leading delay reasons contributing 48%, 32% and 13% of the delays respectively.

IFR Movements by Year and Forecast Type (STATFOR February 2014)



IFR movements in 2019 were circa 5% above the STATFOR February 2014 base forecast.

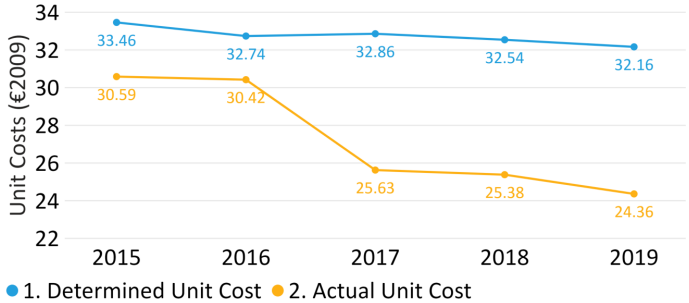
Distribution of Delays (DCAC Cyprus)



DCAC Cyprus delayed 12,493 flights by more than 15 minutes in 2019, which was 49% of all delayed flights.

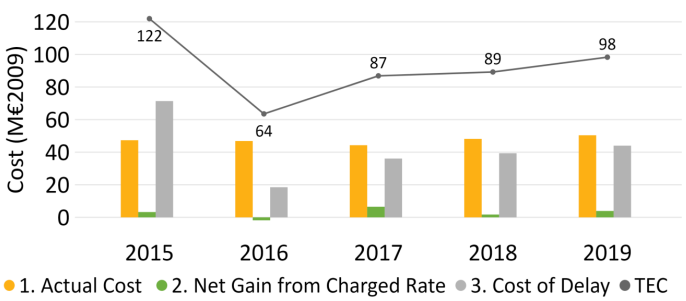
Cost-efficiency

Determined and Actual Unit Costs by Year



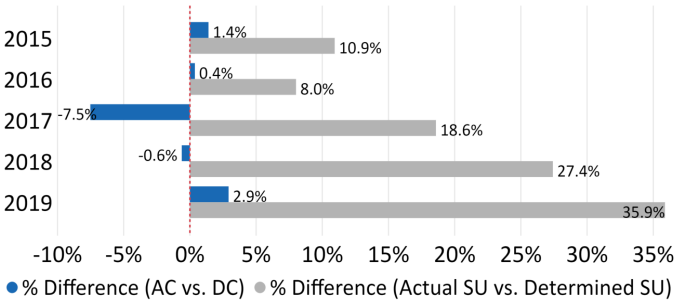
Actual unit costs were lower in each year of RP2. In 2019, actual unit costs were 24% lower than planned.

Total Economic Cost (TEC) and Cost Components by Year



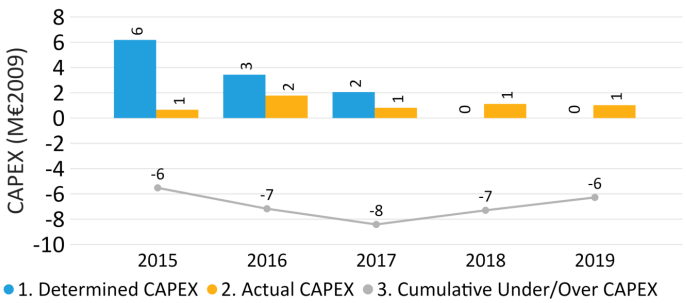
The year-on-year total economic cost for airspace users to use air navigation services in Cyprus increased during 2019 (+10%).

% Difference between Actual and Determined Costs and Service Units by Year



Lower actual unit costs were fuelled by higher service units since 2015.

Determined and Actual CAPEX by Year with Cumulative Difference



Cyprus spent 6M€ less than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- The Czech Republic achieved the target level in all Management Objectives since 2018.
- ANS CR achieved the RP2 target in all MOs since 2015.
- The Czech Republic and CR ANS have achieved the RP2 targets for the application of the Risk Classification Scheme since the start of RP2 where data was reported and remained on or above the targets since.
- Occurrences reported show the normal fluctuations and were below the Union-wide average rates in 2019 except for Runway Incursions (RIs). The Peak for RIs in 2017 exceeded the Union-wide average but fell back in 2018 and 2019 to below Union-wide average.

Environment:

- The Czech Republic did not contribute positively towards FAB CE's actual horizontal flight efficiency environment targets (KEA) in each year of RP2, however the planned horizontal flight efficiency (KEP) contributed positively towards the Union-wide targets in each year of RP2.
- Capacity shortfalls in the network, airspace user route choices and weather were named as the causes for not achieving the targets. However, the targets were not achieved in any month of 2019 – even when delays due to capacity and weather were minimal.
- KEA and en route delays show a correlation of +0.25% per minute of delay in Czech Republic, which suggests improving capacity could improve environmental performance.
- Terminal vertical flight efficiency improved as more flights completed fully continuous climb/descent at two of Czech Republic's airports in 2019 compared to 2015.

Capacity:

- The Czech Republic did not contribute positively towards FAB CE's en route Air Traffic Flow Management (ATFM) delay per flight target in 2019.
- The number of instrument flight rules (IFR) movements in 2019 were between the STATFOR base and high growth forecast and the -1% decrease in IFR movements resulted in a -44% decrease in en route ATFM delays.
- Average en route ATFM delay per flight was 0.21 minute per flight in 2019. Delay causes were almost evenly distributed across weather, ATC capacity and ATC staffing codes, which indicates that some of the ATC capacity problems which were apparent in 2018 have been resolved.
- The proportion of flights that were delayed by more than 15 minutes remained stable since 2017 and was 35% of all delayed flights in 2019.

Cost Efficiency:

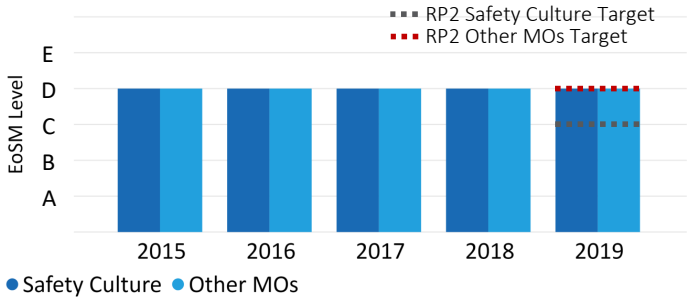
- The Czech Republic did not achieve the en route cost-efficiency target in 2019, with the actual unit cost (36.10€$_{2009}$) being +7% (+2.32€$_{2009}$) higher than the determined unit cost (33.78€$_{2009}$). The Czech Republic did not achieve the en route cost-efficiency targets in 2017 and 2019.
- In 2019, en route actual costs were above the determined costs by +8.9%. The main driver of the difference was the ANS CR staff costs, however, the Czech Republic does not provide a specific explanation of the reasons.
- In 2019, the Czech Republic overspent +24M€$_{2009}$ in CAPEX (+35M€$_{2009}$ over RP2). However, the variation is mostly due to two investments (Data Processing and Presentation (DPS) - three times higher than planned, +32M€$_{2009}$; and buildings - two times higher than planned, +10M€$_{2009}$). Moreover, ANS CR greatly overinvested in "other CAPEX", without speci-fying the destinations of the amounts.
- As a result of investments catching up in 2019, the Czech Republic charged +0.3M€$_{2009}$ (+12.4M€$_{2009}$ over RP2) in cost of capital and depreciation for investments not materialised. The Czech Republic should take into account these amounts when developing the RP3 performance plan. Investments are paramount for the Czech Republic, which did not meet the capacity targets in 2017 and 2019.

PRB Performance review body of the single european sky

Czech Republic Factsheet

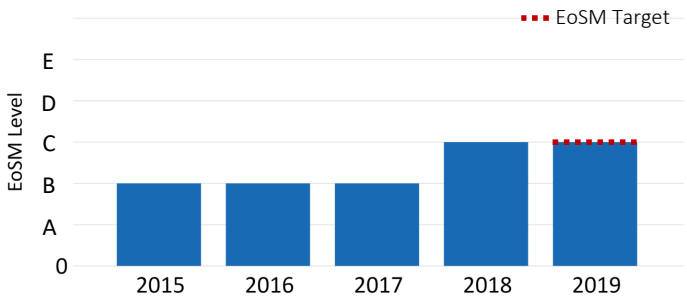
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



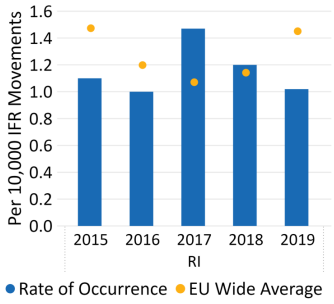
ANS CR has achieved the targets for the EoSM in all safety areas since 2015.

State Effectiveness of Safety Management (EoSM) by Year

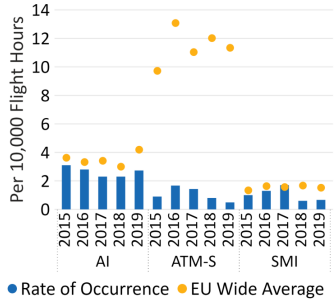


The Czech Republic achieved the targets for the EoSM in all Management Objectives since 2018.

Runway Incursions (RIs) by Year

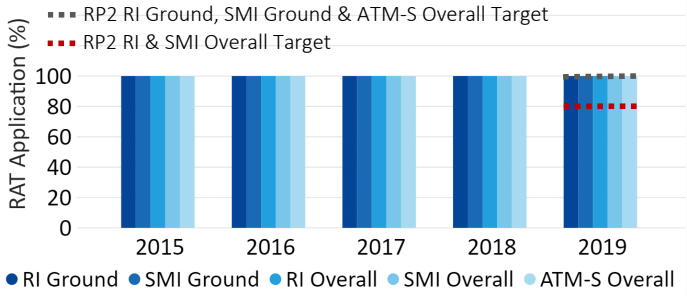


Occurrences by Type and Year



In 2019, RIs and ATM-S occurrences slightly decreased. SMIs and AIs occurrences slightly increased.

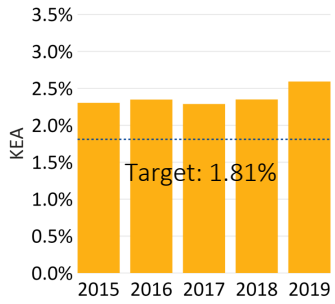
Risk Analysis Tool (RAT) Application to Severity Classification



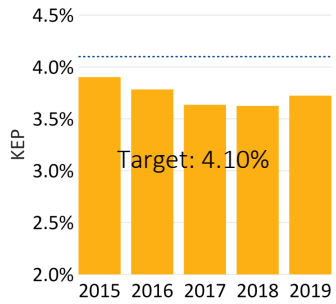
Since 2015, the Czech Republic and ANS CR achieved the targets for the application of the RAT to severity classification.

Environment

RP2 KEA Performance

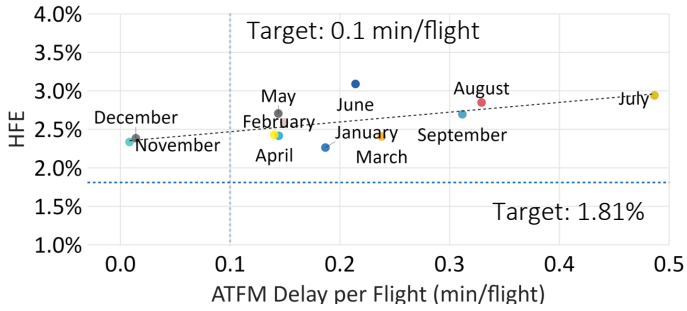


RP2 KEP Performance



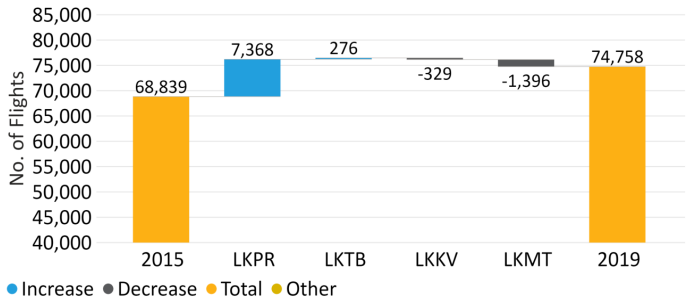
The Czech Republic did not achieve the KEA targets in any year of RP2. However, the KEP targets were achieved.

ATFM Delay per Flight and HFE by Month in 2019



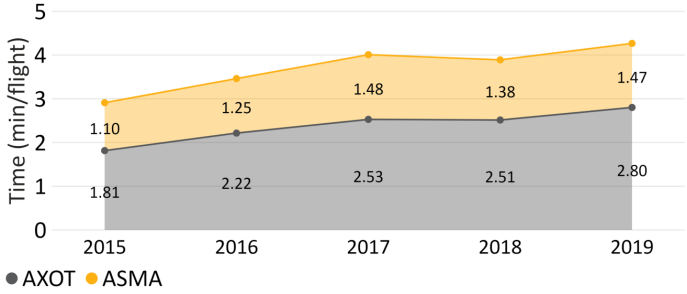
Each minute of additional en route ATFM delay per flight in 2019 correlated with a circa 0.25% increase in HFE.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations increased at regulated airports during RP2 by 5,919 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



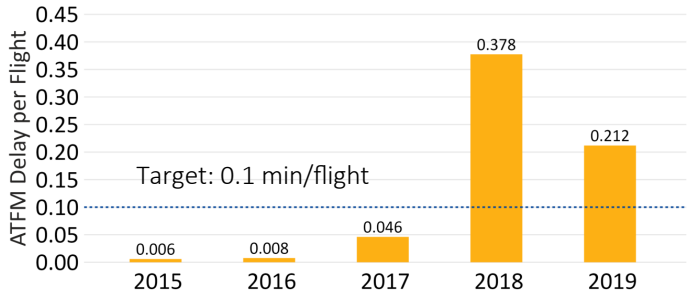
In 2019, 4.27 minutes of AXOT and ASMA were endured by air-space users in the Czech Republic (1/4 airports reported data).

PRB Performance review body of the single european sky

Czech Republic Factsheet

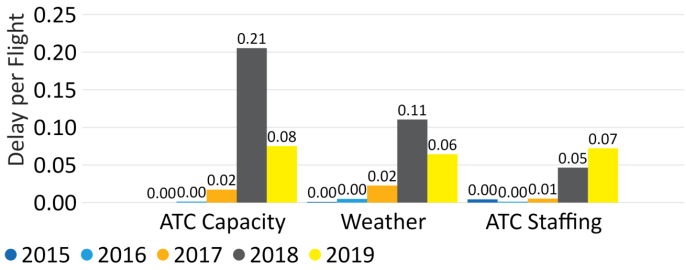
Capacity

ATFM Delay per Flight (min/flight)



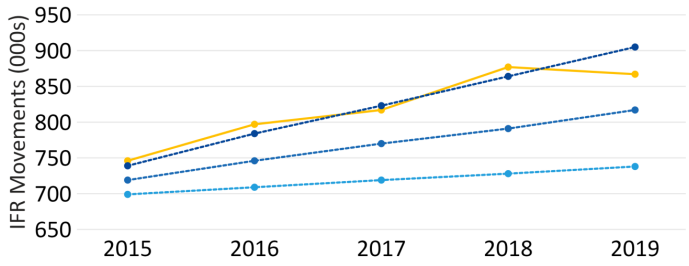
Delays in the Czech Republic decreased year-on-year by 44% in 2019, however the target was still not achieved.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



ATC capacity, weather and staffing were the leading delay reasons contributing 38%, 28% and 33% of 2019 delays respectively.

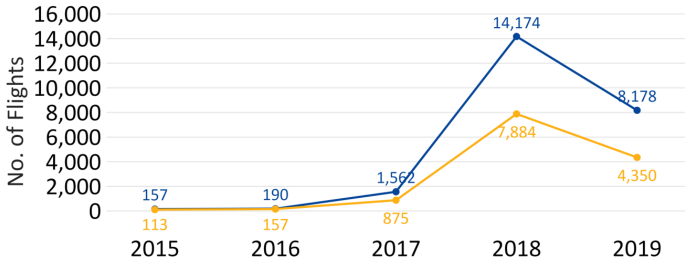
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were 6.1% above the STATFOR February 2014 base forecast and remained below the high forecast.

Distribution of Delays (ANS CR)

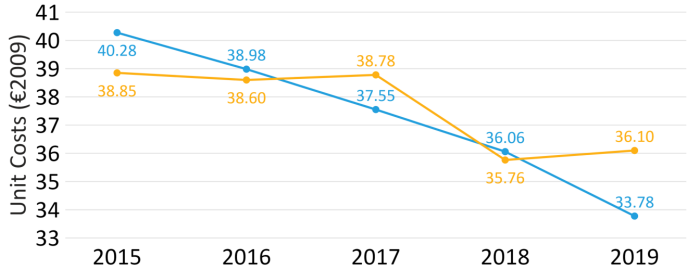


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

ANS CR delayed 4,350 flights by more than 15 minutes in 2019, which was 35% of all delayed flights.

Cost-efficiency

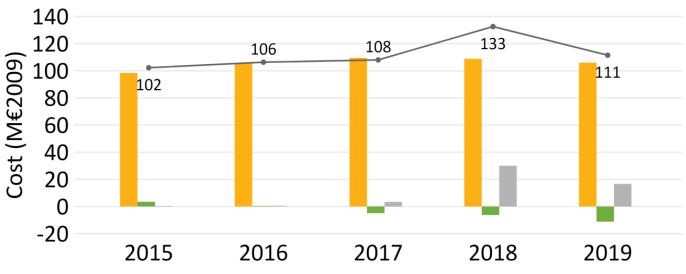
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs moved above and below the planned unit costs in RP2. In 2019, actual unit costs were 7% higher than planned.

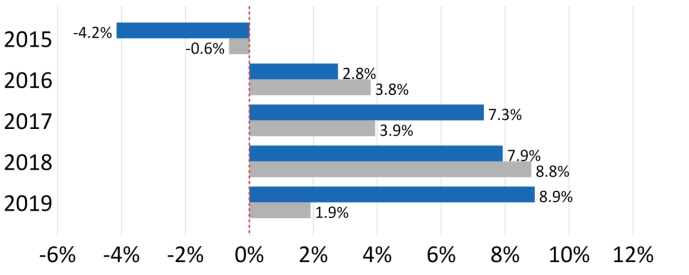
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in the Czech Republic fell during 2019 (-17%).

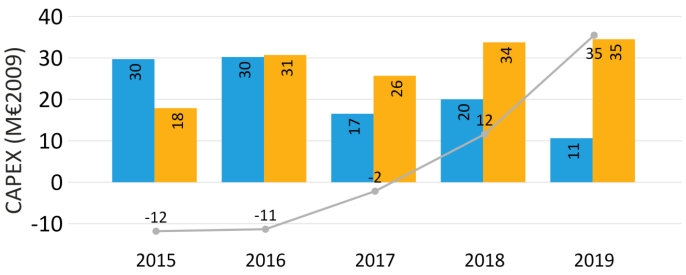
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Other than 2015, spending and service units were higher than planned in RP2.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

The Czech Republic spent 35M€ more than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Denmark did not achieve the RP2 targets for the Effectiveness of Safety Management (EoSM) in any year of RP2.
- Naviair achieved the target level for safety culture since 2015 and for other Management Objectives in 2019.
- No data was reported by Naviair or Denmark for occurrences in 2019 and applicability of Risk Classification Scheme.

Environment:

- Denmark contributed positively towards DK-SE FAB's actual and planned horizontal flight efficiency environment targets (KEA and KEP respectively) in each year of RP2.
- Virtually zero Air Traffic Flow Management (ATFM) delays were incurred and therefore the capacity impact on the environmental performance was minimal.
- Vertical flight efficiency in terms of the absolute number of flights conducting fully Continuous Climb Operations/ Continuous Descent Operations (CCO/CDO) increased by almost 10,000 flights at Copenhagen airport during RP2.
- On average, airspace users spent 3.66 additional minutes per flight taxiing out or in terminal airspace in 2019.

Capacity:

- Denmark continued meeting its national capacity target and positively contributed to the DK-SE FAB performance in the capacity KPA, as it has done so in all years of RP2. The average en route ATFM delay per flight decreased from 0.01 minutes reached in 2018 to virtually zero minutes in 2019.
- Actual instrument flight rules (IFR) movements kept between STATFOR low and base traffic growth scenarios although slowly converged to the low growth profile closer to 2019.
- No delay causes were identified for 2019 with zero delays recorded across all delay categories.

Cost Efficiency:

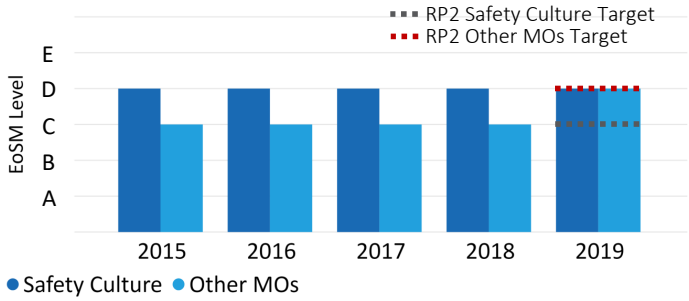
- Denmark achieved the en route cost-efficiency target in 2019, with the actual unit cost (47.53€$_{2009}$) being lower than the determined unit cost (50.84€$_{2009}$). Denmark achieved the en route cost-efficiency targets in each year of RP2.
- In 2019, en route actual costs were above the determined costs by +2.3%. The main factor creating the difference is a lower than planned inflation rate. In nominal terms, costs remained below determined in each year of RP2.
- In 2019, Denmark overspent +1M€$_{2009}$ in CAPEX (+1M€$_{2009}$ over RP2). Over RP2, Denmark covered the investments gap generated in 2015.
- As a result of investments catching up, in 2019 Denmark charged +1.6M€$_{2009}$ (+8.3M€$_{2009}$ over RP2) in cost of capital and depreciation for investments not materialised.

PRB Performance review body of the single european sky

Denmark Factsheet

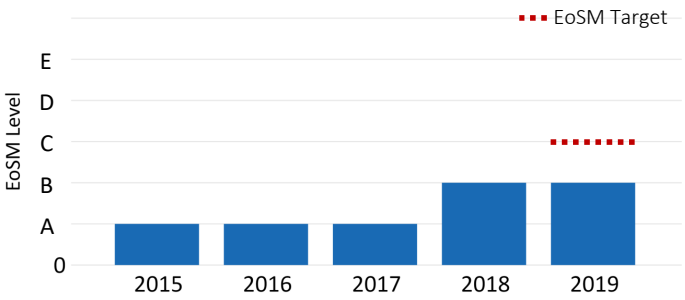
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



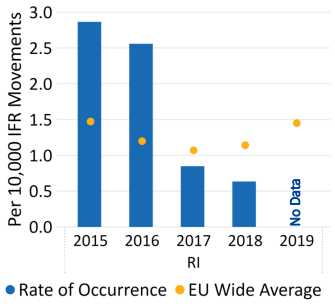
Naviair has achieved the targets for the EoSM safety culture since 2015 and targets for other Management Objectives in 2019.

State Effectiveness of Safety Management (EoSM) by Year

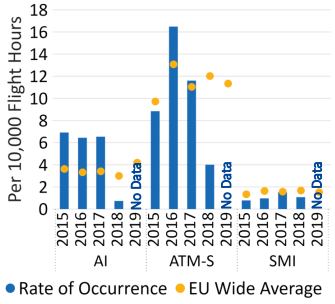


Denmark did not achieve the target for the EoSM in any year of RP2.

Runway Incursions (RIs) by Year

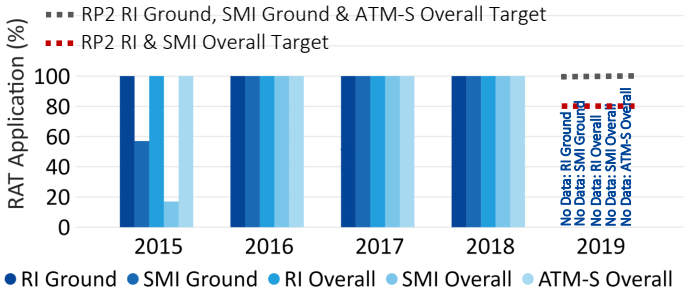


Occurrences by Type and Year



No data was reported by Naviair or Denmark for occurrences in 2019.

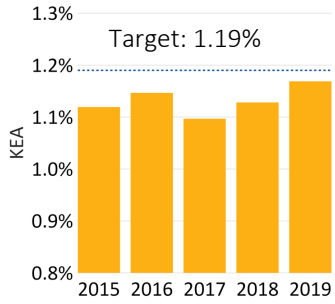
Risk Analysis Tool (RAT) Application to Severity Classification



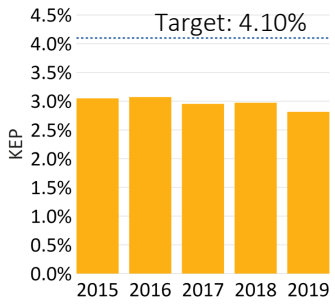
No data was reported by Naviair or Denmark for occurrences in 2019.

Environment

RP2 KEA Performance

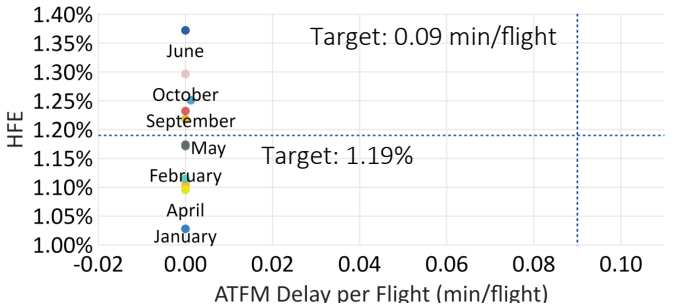


RP2 KEP Performance



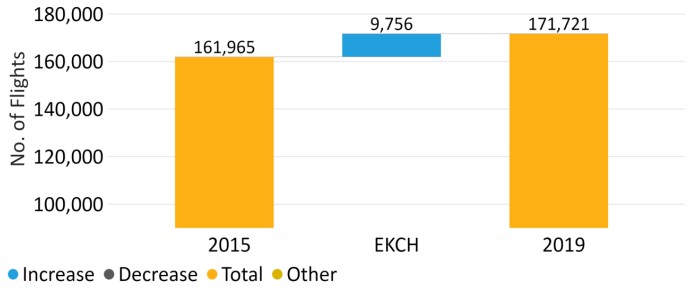
Denmark achieved the KEA targets in each year of RP2. The KEP targets were also achieved in each year of RP2.

ATFM Delay per Flight and HFE by Month in 2019



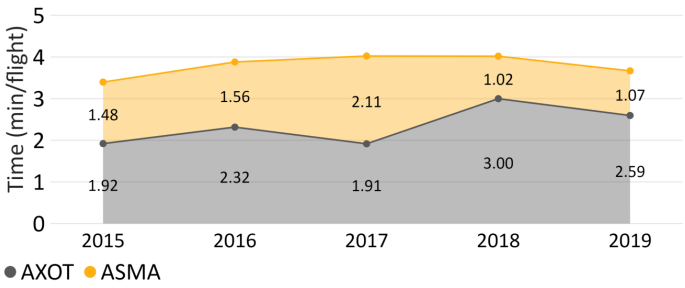
Denmark incurred virtually zero delays in 2019 meaning it minimised it capacity impact on environmental performance.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations increased at regulated airports during RP2 by 9,756 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



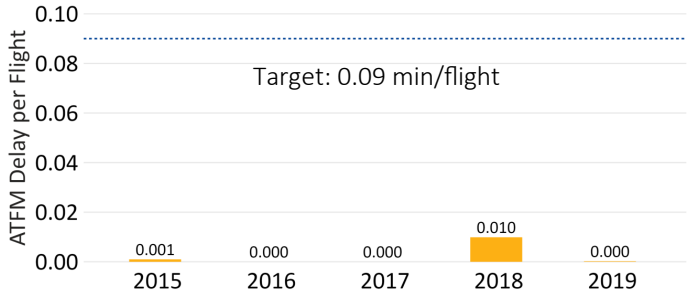
In 2019, 3.66 minutes of AXOT and ASMA was endured by airspace users in Denmark (1/1 regulated airports reported data).

PRB Performance review body of the single european sky

Denmark Factsheet

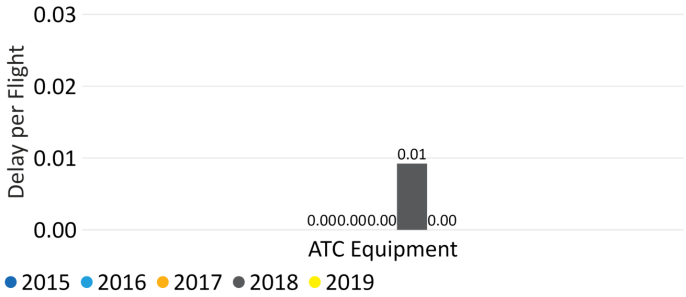
Capacity

ATFM Delay per Flight (min/flight)



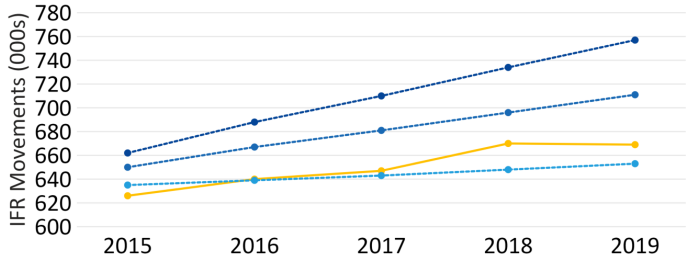
Delays in Denmark were for below the targets during RP2.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



ATC Equipment was the main reason of the minor delays experienced by airspace users in 2018.

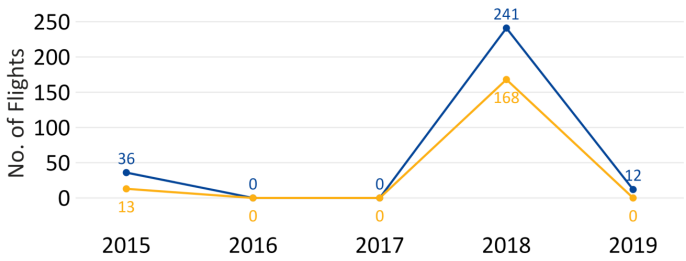
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements were below the STATFOR February 2014 base forecast and circa 2.5% above the low forecast in 2019.

Distribution of Delays (NAVAIR)

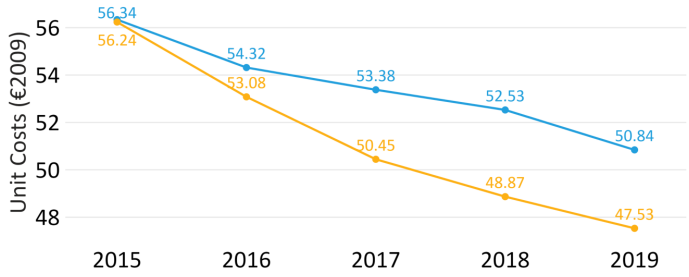


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

NAVAIR did not delay any flights by more than 15 minutes in 2019. 12 flights were delayed less than 15 minutes.

Cost-efficiency

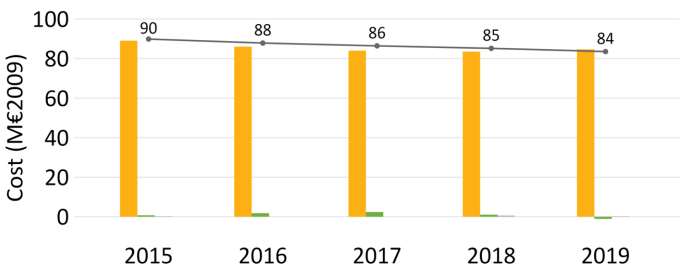
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower than planned in each year of RP2. In 2019, actual unit costs were 6.5% lower than planned.

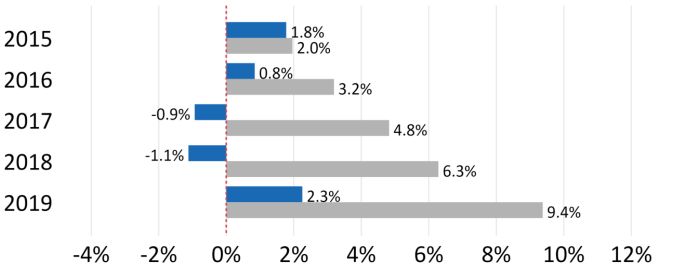
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The total economic cost for airspace users to use air navigation services in Denmark decreased in each year of RP2.

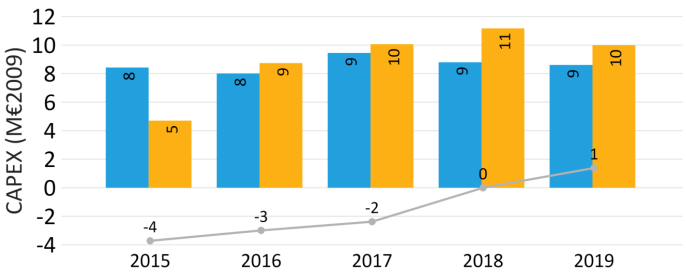
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Lower actual unit costs were fuelled by higher than planned service units.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Denmark spent 1M€ more than planned over RP2 on CAPEX projects and recovered from underspend in 2015.

Comments from the PRB:

Safety:

- Estonia achieved the target level in all Management Objectives (MOs) in 2019.
- EANS achieved the RP2 target level in all MOs since 2015.
- Estonia and EANS have achieved the RP2 targets for the application of the Risk Classification Scheme since 2018.
- Separation Minima Infringements (SMIs), Airspace Infringements (AIs) and Air Traffic Management Specific (ATM-S) occurrences in 2019 remained below the Union-wide average. Rates of Runway Incursions (RIs), SMIs and AIs have generally improved over RP2. ATM-S occurrences have increased year by year.

Environment:

- Estonia did not contribute positively towards NEFAB's actual horizontal flight efficiency environment targets (KEA) in any year of RP2, although the planned horizontal flight efficiency (KEP) targets were achieved.
- The NSA monitoring report does not clearly explain why the targets were not achieved although it suggests that air-space restrictions could have impacted performance. Other reasons include non-uniform charged rates and adverse weather.
- Terminal vertical flight efficiency improved as more flights completed fully continuous climb/descent at Estonian air-ports in 2019 compared to 2015.
- On average, airspace users spent 1.29 additional minutes per flight taxiing out or in terminal airspace in 2019. This has remained stable since 2015.

Capacity:

- Estonia contributed positively towards the en route Air Traffic Flow Management (ATFM) delay per flight targets of NEFAB in 2019, consistently delivering better performance than its FAB and national reference values in all years of RP2.
- Following three years of traffic growth, in 2019 there was a 1% decline in traffic compared to 2018, which resulted traffic levels closer to the STATFOR base scenario. This was accompanied by a 96% decrease in en route ATFM delays.
- The proportion of flights that were delayed by more than 15 minutes dropped to 19% in 2019, a 20 percentage point decrease from 2018.

Cost-efficiency:

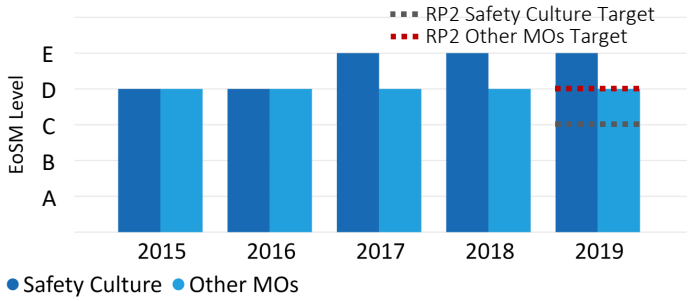
- Estonia did not achieve the en route cost-efficiency target in 2019, with the actual unit cost (25.53€$_{2009}$) being higher than the determined unit cost (22.92€$_{2009}$). 2019 is the first year of RP2 in which Estonia did not achieve the cost-efficiency targets.
- In 2019, en route actual costs were above the determined costs by +13.3%. The increase was mainly due to higher than planned depreciation costs and costs of capital related to investments.
- In 2019, Estonia overspent +1M€$_{2009}$ in CAPEX (+8M€$_{2009}$ over RP2).
- Despite having overinvested over the period, Estonia charged +1M€$_{2009}$ more over RP2 in cost of capital and depreciation with respect to the actual values. Estonia should take into account these amounts when developing the RP3 performance plan.

PRB Performance review body of the single european sky

Estonia Factsheet

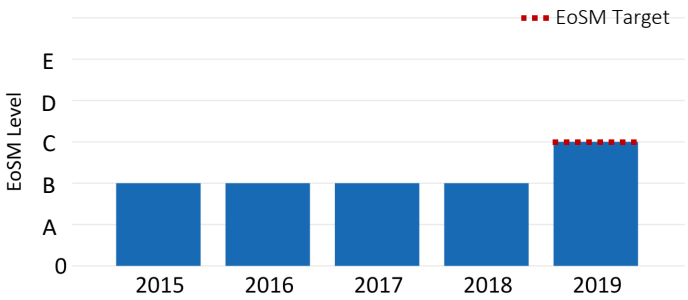
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



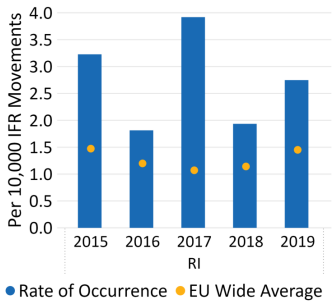
EANS achieved the targets for the EoSM in all MOs since 2015.
EANS achieved level E in safety culture in 2017.

State Effectiveness of Safety Management (EoSM) by Year

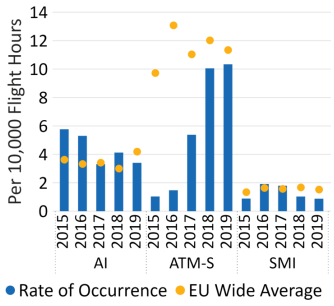


Estonia achieved the targets for the EoSM in all MOs in 2019.

Runway Incursions (RIs) by Year

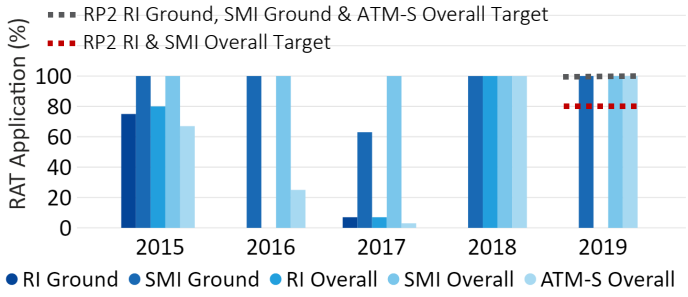


Occurrences by Type and Year



Rates of RIs, SMIs and AIs have improved compared to 2015 but ATM-S occurrences have increased year by year.

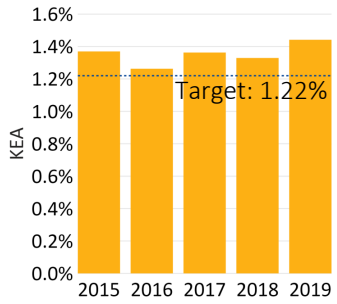
Risk Analysis Tool (RAT) Application to Severity Classification



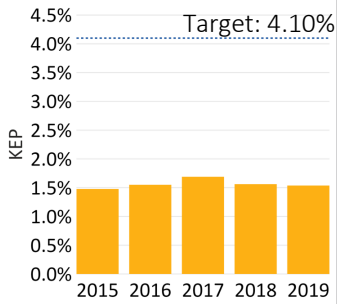
In 2018 and 2019, Estonia and EANS achieved the targets for the application of the RAT to severity classification.

Environment

RP2 KEA Performance

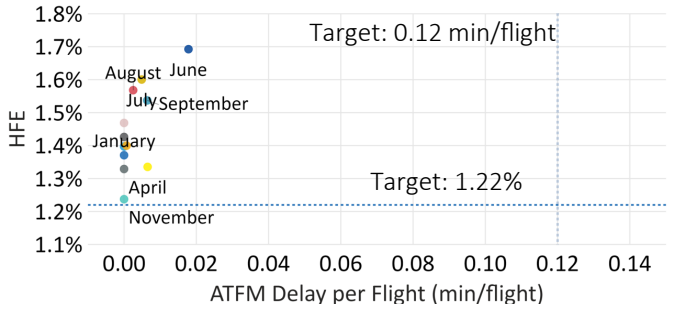


RP2 KEP Performance



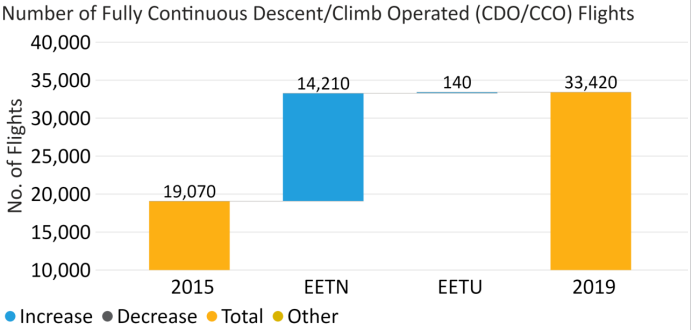
Estonia did not achieve the KEA targets during RP2. However, the KEP targets were achieved in each year.

ATFM Delay per Flight and HFE by Month in 2019



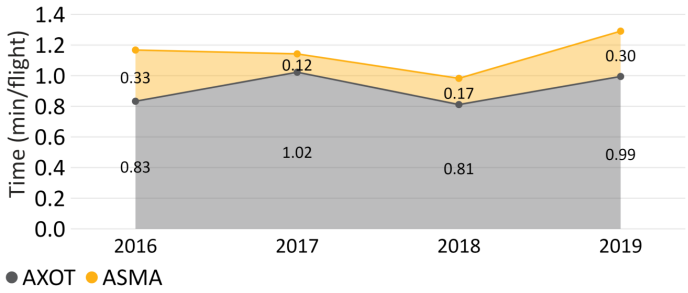
Estonia incurred almost zero delays in 2019 meaning it minimised it capacity impact on environmental performance.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations increased at regulated airports during RP2 by 14,350 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



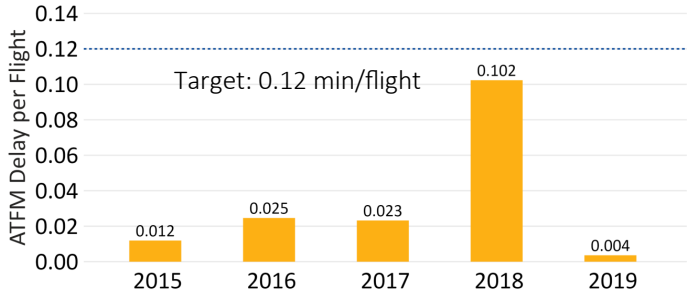
In 2019, 1.29 minutes of AXOT and ASMA was endured by air-space users in Estonia (1/2 regulated airports reported data).

PRB Performance review body of the single european sky

Estonia Factsheet

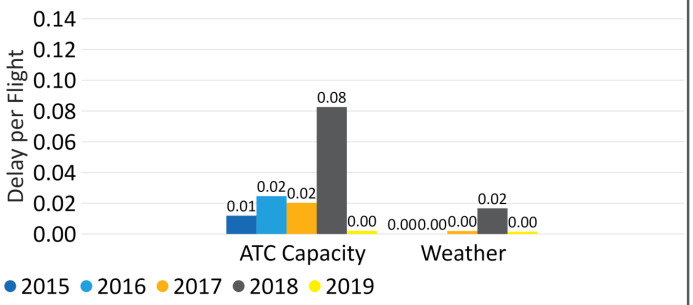
Capacity

ATFM Delay per Flight (min/flight)



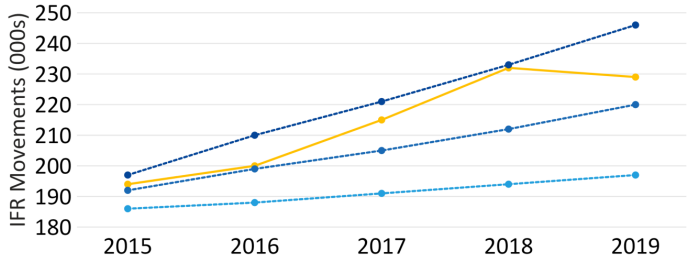
Estonia achieved the capacity targets in each year of RP2. Other than 2018, delays were stable and near zero.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



ATC capacity and weather were the leading delay reasons in 2018. Minimal delays was recorded in 2019.

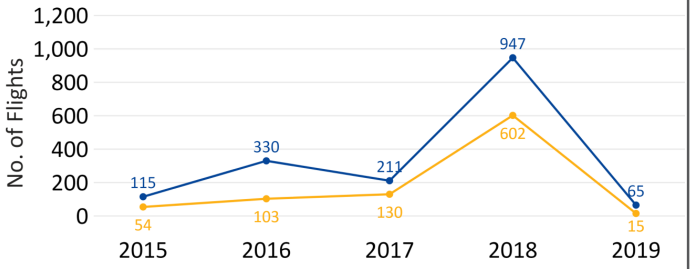
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were circa 4% above the STATFOR February 2014 base forecast.

Distribution of Delays (EANS)

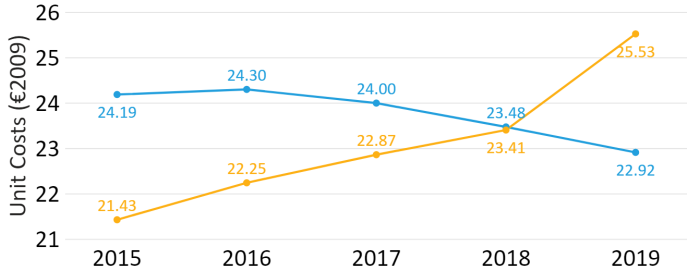


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

EANS delayed 15 flights by more than 15 minutes in 2019, which was 19% of all delayed flights.

Cost-efficiency

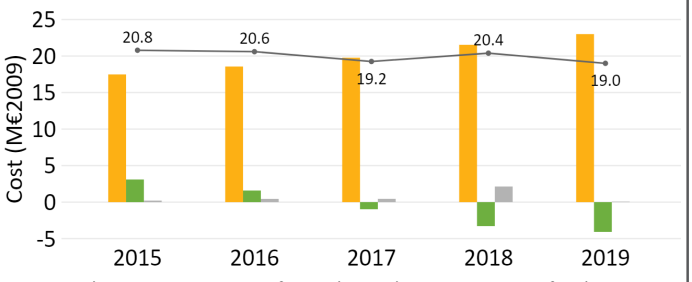
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower than planned until 2019. In 2019, actual unit costs were 11% higher than planned.

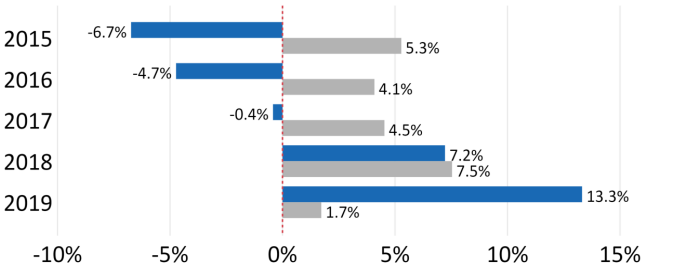
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Estonia decreased during 2019 (-7%).

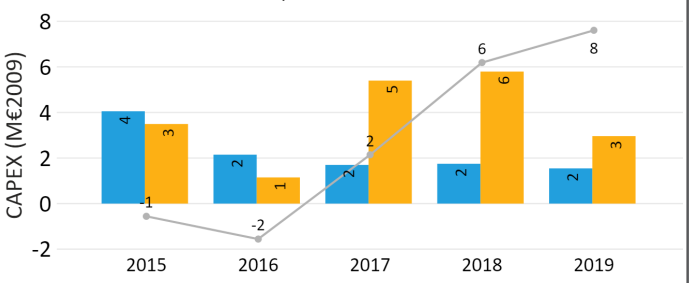
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Higher than planned actual unit costs in 2019 were caused by higher than planned costs.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Estonia spent 8M€ more than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Finland did not achieve the RP2 targets for the Effectiveness of Safety Management (EoSM) in 2019 and did not improve the minimum level over RP2.
- ANS Finland achieved the RP2 target for safety culture in 2015 and for other Management Objectives since 2016.
- Finland and ANS Finland achieved the RP2 targets for the application of the Risk Classification Scheme since 2015.
- Rates of all occurrence types remained above Union-wide average in most years of RP2. Rates of Runway Incursions (RIs) and Separation Minima Infringements (SMIs) increased between 2018 and 2019. Rate of Airspace Infringements (AIs) and Air Traffic Management Specific (ATM-S) has decreased over RP2 but remained above the Union-wide average.

Environment:

- Finland contributed positively towards NEFAB's actual and planned horizontal flight efficiency environment targets (KEA and KEP respectively) in each year of RP2.
- Terminal vertical flight efficiency did not improve as fewer flights completed fully continuous climb/descent at Helsinki -Vantaa International airport in 2019 compared to 2015.
- On average, airspace users spent 4.23 additional minutes per flight taxiing out or in terminal airspace in 2019.

Capacity:

- Finland contributed positively towards NEFAB's en route ATFM delay per flight targets in 2019 with zero ATFM delay per flight recorded for the fourth consecutive year.
- The number of instrument flight rules (IFR) movements in 2019 was below the STATFOR high growth forecast and the 0.7% growth in IFR movements had no impact on en route ATFM delay per flight.
- No delay causes were identified for 2019 with zero delays recorded across all delay categories.

Cost-efficiency:

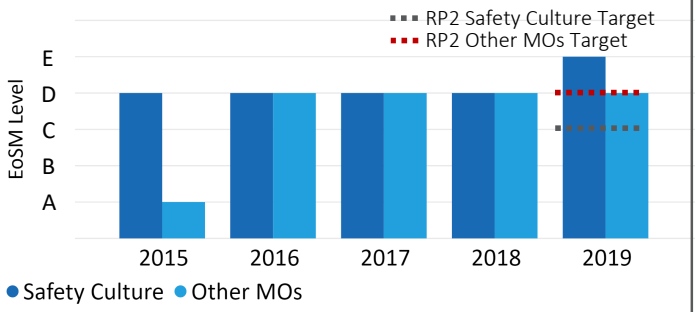
- Finland achieved the en route cost-efficiency target in 2019 with the actual unit cost (36.52€$_{2009}$) being lower than the determined unit cost (43.74€$_{2009}$). Finland did not achieve the en route cost-efficiency targets in 2015 and 2016.
- In 2019, en route actual costs were below the determined costs by -2%. The difference was mainly due to lower than planned depreciation costs and costs of capital, stemming from the delay in the investments planned and from the separation between Finavia and ANS Finavia.
- In 2019, Finland underspent -1M€$_{2009}$ in CAPEX (-27M€$_{2009}$ over RP2). As a result of the underinvestment, in 2019 Finland charged +3.3M€$_{2009}$ (+10.8M€$_{2009}$ over RP2) in cost of capital and depreciation for investments not materialised. Finland should take into account these amounts when developing the RP3 performance plan. En route actual costs show a steady decrease over the period.

PRB Performance review body of the single european sky

Finland Factsheet

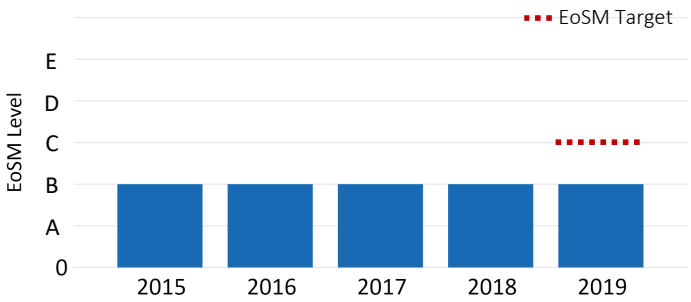
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



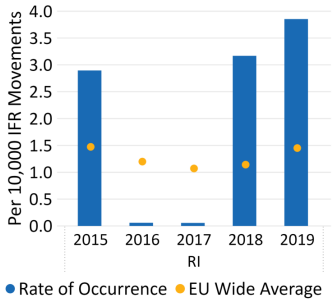
ANS Finland achieved the target level for safety culture since 2015 and for other Management Objectives since 2016.

State Effectiveness of Safety Management (EoSM) by Year

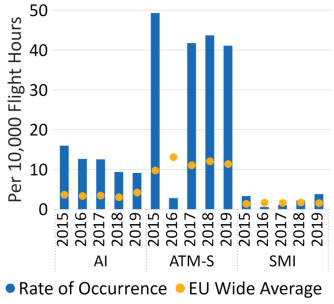


Finland did not achieve the EoSM targets in all MOs in 2019 and has not improved the over RP2.

Runway Incursions (RIs) by Year

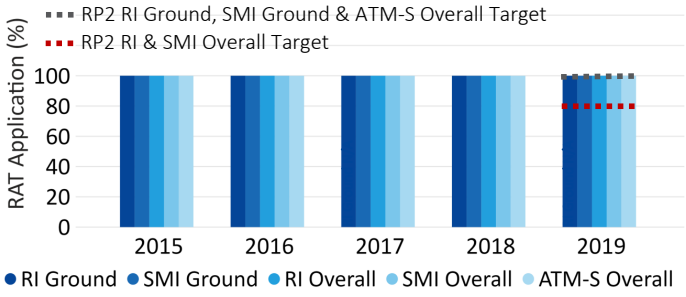


Occurrences by Type and Year



Rates of RI and SMI occurrences increased between 2018 and 2019. Rates of all occurrences were above the EU average.

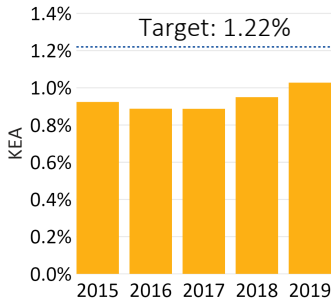
Risk Analysis Tool (RAT) Application to Severity Classification



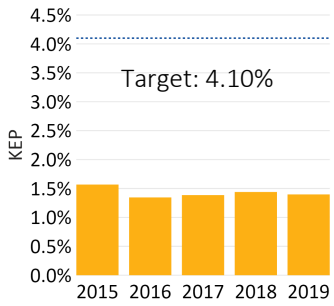
Since 2015, ANS Finland and Finland have achieved the targets for the application of the RAT to severity classification.

Environment

RP2 KEA Performance

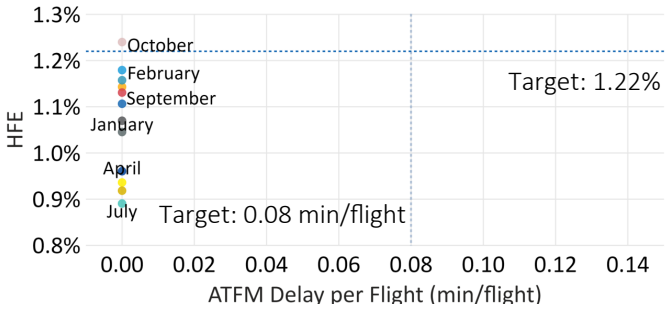


RP2 KEP Performance



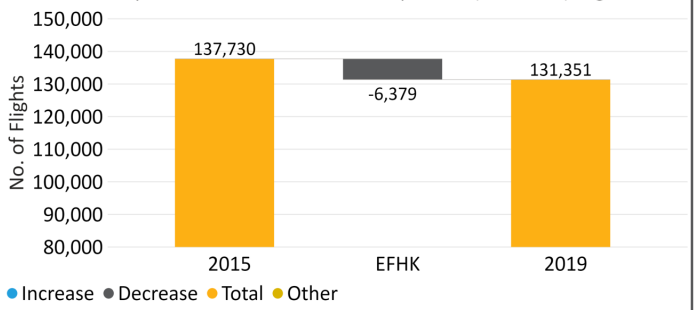
Finland achieved its KEA targets in each year of RP2. The KEP targets were also achieved in each year of RP2.

ATFM Delay per Flight and HFE by Month in 2019



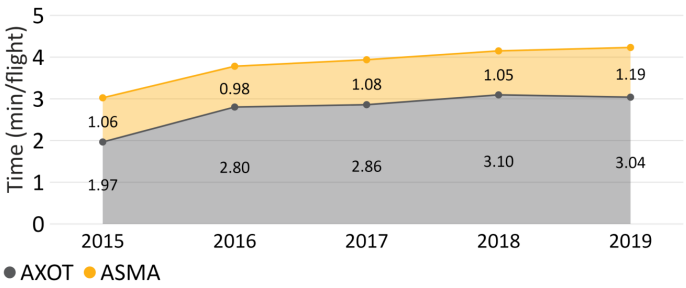
Finland incurred virtually zero delays in 2019 meaning it minimised it capacity impact on environmental performance.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations fell at regulated airports during RP2 by 6,379 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



4.23 minutes of AXOT and ASMA were endured by airspace users in Finland in 2019 (1/1 regulated airports reported data).

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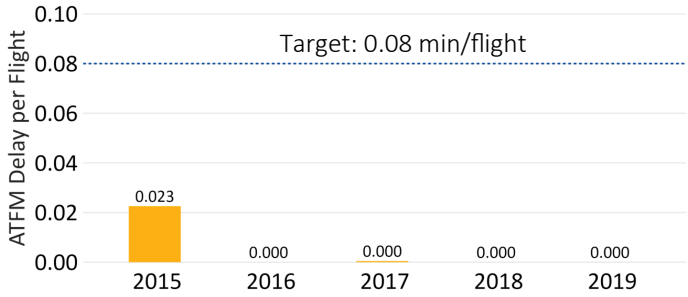
Finland Factsheet

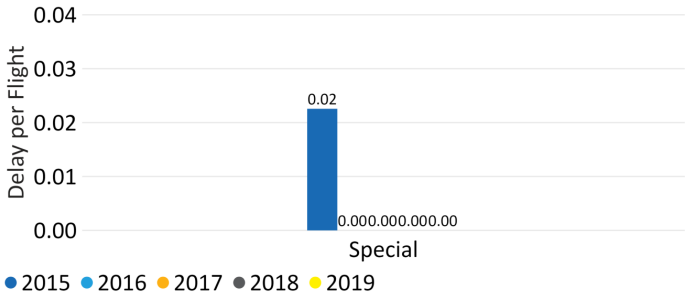
Capacity

ATFM Delay per Flight (min/flight)



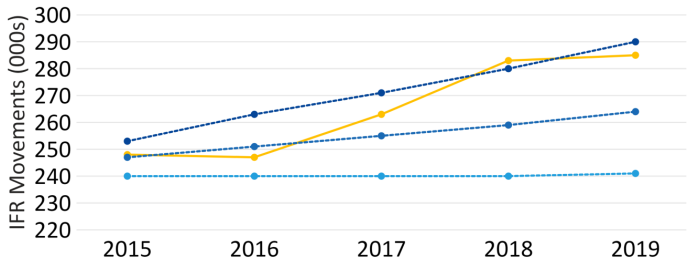
Delays in Finland were stable and below targets each year of RP2. ATFM delay in 2019 was 0.00 min/flight.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



Delays were virtually zero in 2019 and therefore the use of delay codes was not necessary.

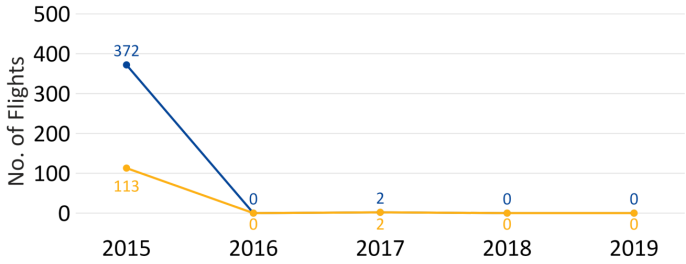
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were circa 1.7% below the STATFOR February 2014 high forecast .

Distribution of Delays (ANS Finland)

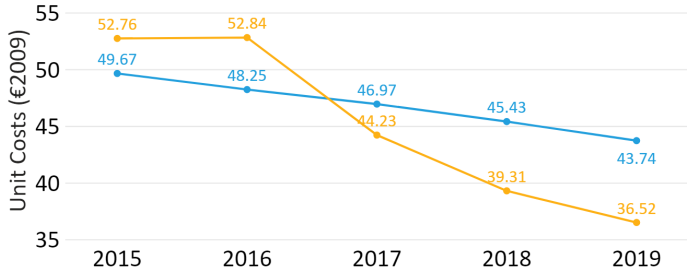


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

ANS Finland delayed zero flights in 2019.

Cost-efficiency

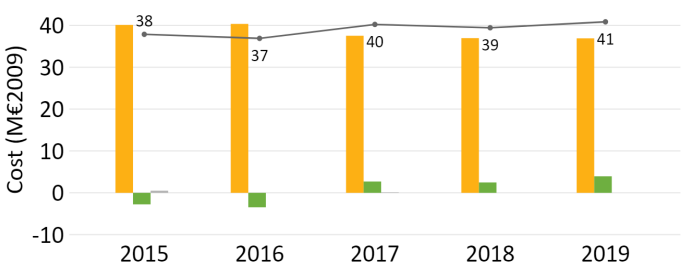
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower than planned since 2017. In 2019, actual unit costs were 17% lower than planned.

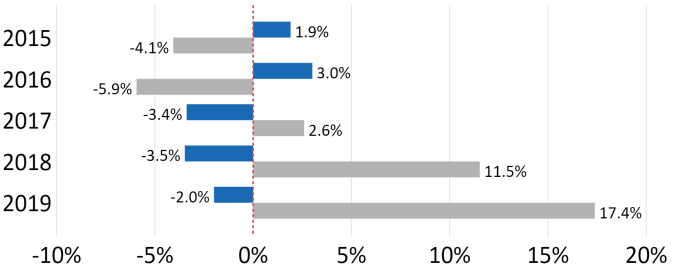
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Finland increased during 2019 (+5%).

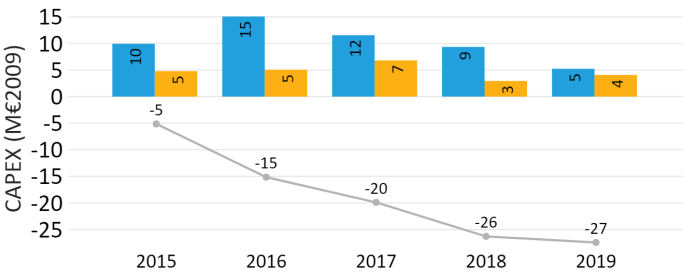
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Lower actual unit costs were fuelled by higher than planned service units and lower spending since 2017.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Finland spent 27M€ less than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- France did not achieve the RP2 targets for the Effectiveness of Safety Management (EoSM) in 2019 and did not improve the minimum level over RP2.
- DSNA achieved the RP2 target level for safety culture in 2015 and for other Management Objectives in 2018.
- DSNA achieved the targets for the application of the RAT to severity classification. France was marginally below the target for ATM-S overall occurrences.
- Rates of RI, SMI and AI occurrences increased slightly in 2019 and ATM-S occurrences improved. Rates of 2019 have improved relative to 2015. RI and AI rates are below and SMI and ATM-S above the EU-wide averages.

Environment:

- France did not contribute positively towards FABEC's actual or planned horizontal flight efficiency environment targets (KEA or KEP respectively) in any year of RP2.
- FABEC claimed that the differences between shortest and cheapest routes are decreasing, which will lead to lower KEA. On the other hand, capacity performance and related mitigation measures led to a counteracting effect meaning performance was stable. However, the KEA targets were not achieved in any month of 2019, even when delays were minimal.
- KEA and en route delays show a correlation of circa +0.15% per minute of delay in France, which suggests improving capacity could improve environmental performance.
- Terminal vertical flight efficiency did not improve as fewer flights completed fully continuous climb/descent at French airports in 2019 compared to 2015. On average, airspace users spent 3.78 additional minutes per flight taxiing out or in terminal airspace – an improvement compared to 2015. One independently reporting French airport is yet to report terminal environmental performance data.

Capacity:

- France did not contribute positively towards the en route Air Traffic Flow Management (ATFM) delay per flight targets of FABEC in 2019, missing the target level in all years of RP2.
- Traffic growth was between the STATFOR base and high scenarios between 2016 and 2019. In 2019, the year-on-year traffic growth was 1.3%, which was accompanied by a decrease of -27% in total delays.
- ATC staffing, ATC capacity and ATC strikes remained the main driving factors together with weather, but ATC equipment code was also significant.
- Nearly half of DSNA delays were generated by Marseille ACC ,where the rostering scheme is not fully optimised with peak hours and weekends.
- The proportion of flights that were delayed by more than 15 minutes decreased by more than 10 percentage points from 50.55% in 2018 to 39.95% in 2019.

Cost-efficiency:

- France achieved the en route cost-efficiency target in 2019, with the actual unit cost (53.88€$_{2009}$) being lower than the determined unit cost (58.23€$_{2009}$).
- In 2019, en route actual costs were below the determined costs by -1%. Actual costs have been in line with the determined ones during RP2.
- In 2019, France overinvested +16.2M€$_{2009}$ in CAPEX (+2.8M€$_{2009}$ over RP2). Investments have been realised following the plans, with relatively small variations against the determined values. Despite it, capacity targets have not been met in the last two years of RP2.
- Over RP2, France charged +49.7M€$_{2009}$ for depreciation and cost of capital more than planned. Due to the accounting system (i.e. reporting part of depreciation as other operating costs), it is difficult to evaluate if these amounts are related to investments not materialised.

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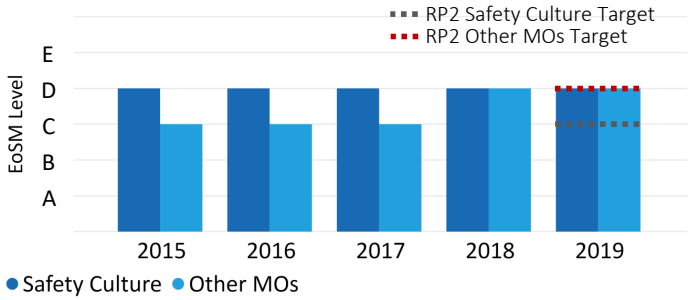
France Factsheet

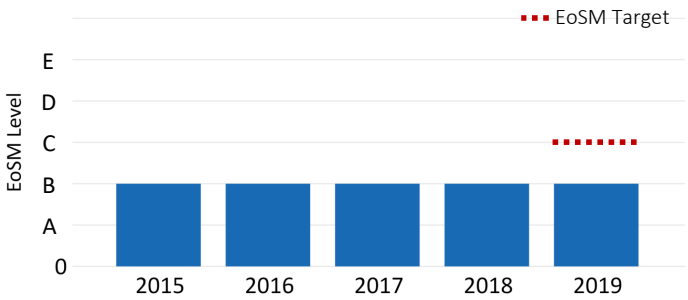
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



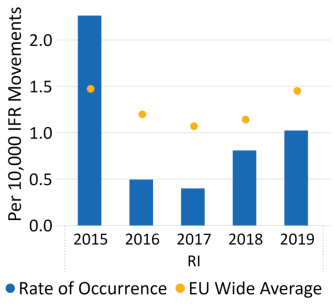
DSNA achieved the RP2 target level for safety culture since 2015 and for other Management Objectives since 2018.

State Effectiveness of Safety Management (EoSM) by Year

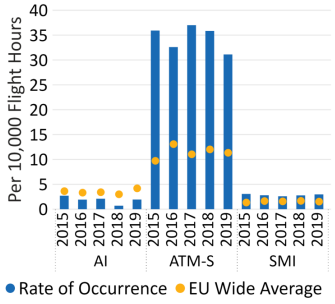


France did not achieve the targets for the EoSM in all MOs and has not improved the minimum level.

Runway Incursions (RIs) by Year

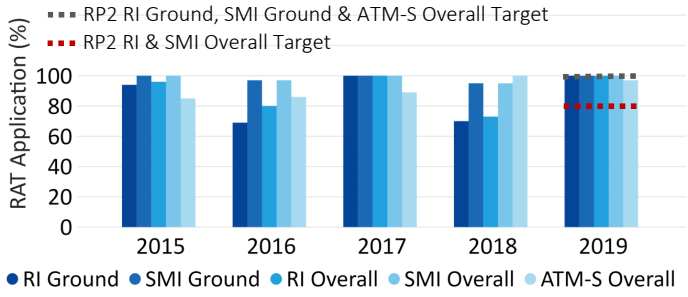


Occurrences by Type and Year



Rates of RI, SMI and AI occurrences increased slightly in 2019 and ATM-S occurrences improved. Rates have improved over RP2.

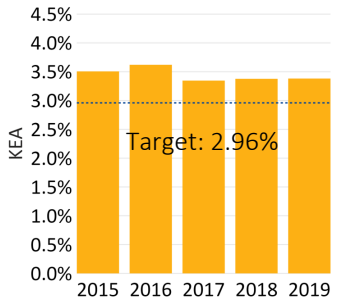
Risk Analysis Tool (RAT) Application to Severity Classification



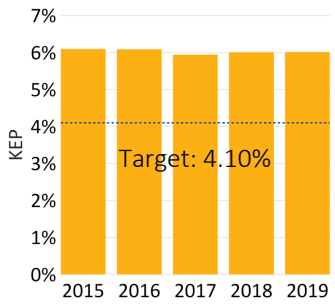
In 2019, DSNA achieved the targets for the application of the RAT. France was below the target for ATM-S overall occurrences.

Environment

RP2 KEA Performance

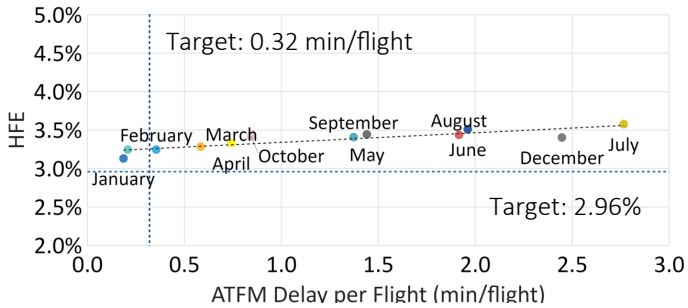


RP2 KEP Performance



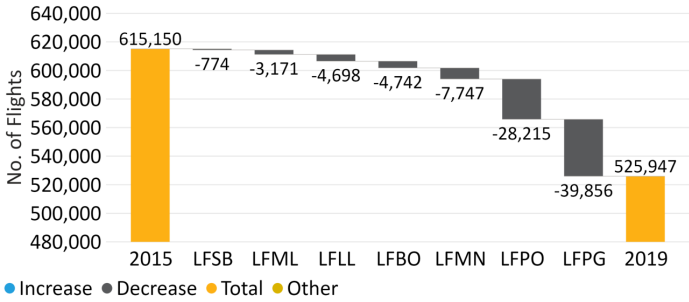
France did not achieve the KEA or KEP targets in any year of RP2.

ATFM Delay per Flight and HFE by Month in 2019



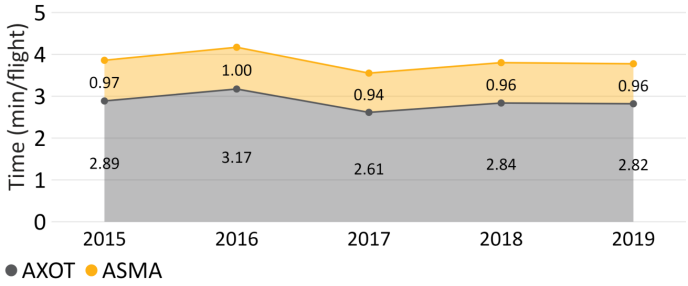
Each minute of additional en-route ATFM delay per flight correlated with a circa 0.15% increase in KEA.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations fell at regulated airports (led by LFPG) during RP2 by 89,203 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



3.78 minutes of AXOT and ASMA were endured by airspace users in France (6/7 independently reporting airports reported data).

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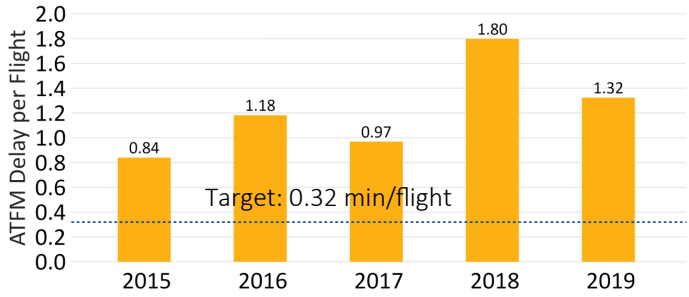
France Factsheet

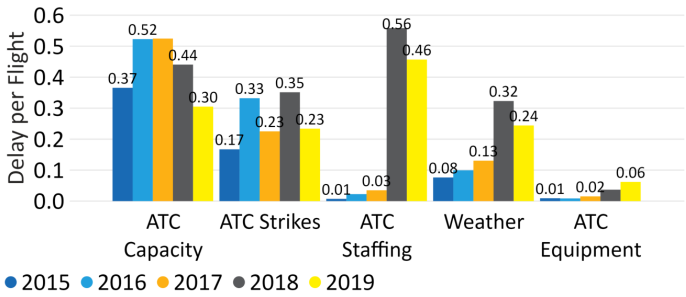
Capacity

ATFM Delay per Flight (min/flight)



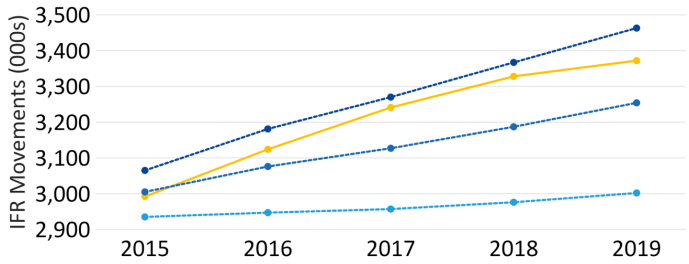
Delays in France decreased in 2019 by 27% compared to 2018. France did not achieve the targets RP2.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



Strikes, ATC capacity, staffing were the leading delay reasons contributing 18%, 23% and 35% of the delays respectively.

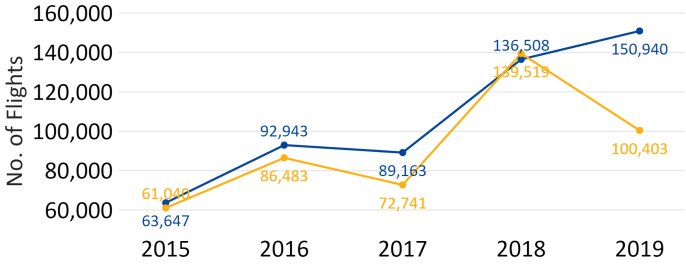
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were 4% above the STATFOR February 2014 base forecast and were below the high forecast.

Distribution of Delays (DSNA)

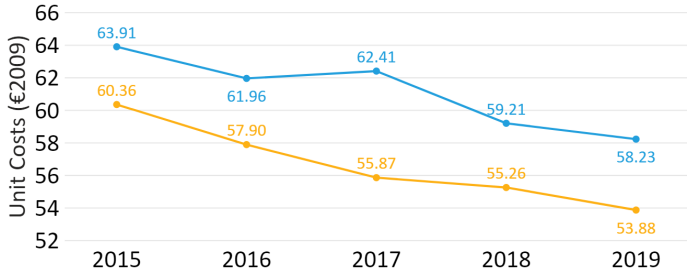


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

DSNA delayed 100,403 flights by more than 15 minutes in 2019, which was 40% of all delayed flights.

Cost-efficiency

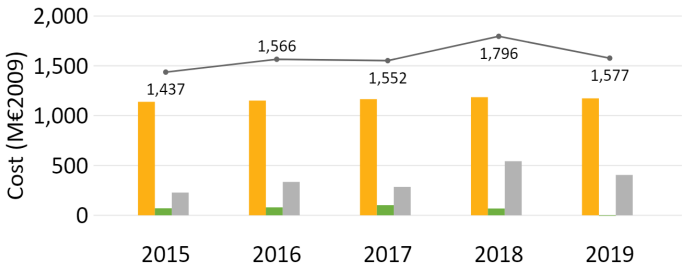
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower in each year of RP2. In 2019, actual unit costs were 7% lower than planned.

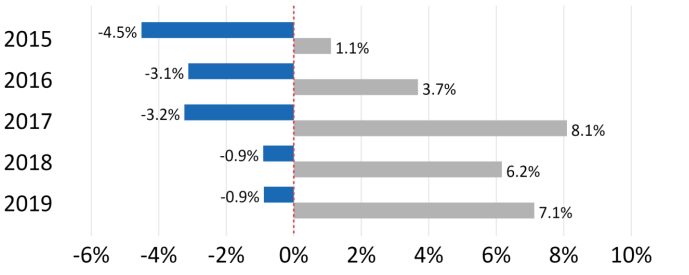
Total Economic Cost and Cost Component (TEC) by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in France decreased in 2019 (-12%).

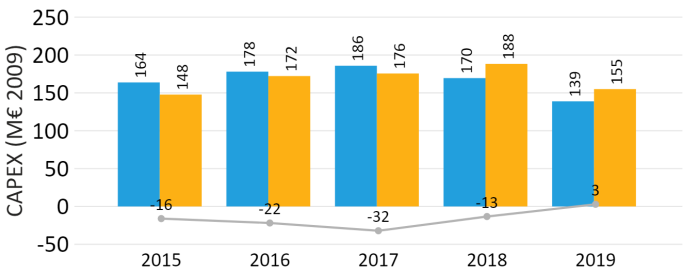
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Lower actual unit costs were fuelled by lower spending and higher service units compared to the plan in every year of RP2.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

France spent 16M€ more than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Germany achieved the target level in all Management Objectives (MOs) since 2018.
- DFS achieved the target level in safety culture since 2015 and for other MOs since 2016.
- DFS achieved the targets for the application of the RAT to severity classification. Germany was marginally below the target for ATM-S overall occurrences.
- The number of Runway Incursion (RI) and Airspace Infringement (AI) per flight hour increased but remained below the Union-wide averages. The Separation Minima Infringement (SMI) remained stable approaching the Union-wide averages. The Air Traffic Management Specific (ATM-S) occurrences peak in 2017 fall back under Union-wide wide average in 2019.

Environment:

- Germany did not contribute positively towards FABEC's actual horizontal flight efficiency environment targets (KEA) in 2019 for the first time in RP2. It did not achieve KEP targets in any year of RP2.
- Capacity bottlenecks in western Europe and airspace user route choices were cited by the NSA as causes for the underperformance. Germany managed to achieve the environment targets in months when delays were below 1.5 minutes per flight.
- KEA and en route delays show a correlation of +0.2% per minute of delay in Germany, which suggests improving capacity could improve environmental performance.
- Terminal vertical flight efficiency did not improve as fewer flights completed fully continuous climb/descent at German airports in 2019 compared to 2015.
- On average, airspace users spent 4.31 additional minutes per flight taxiing out or in terminal airspace in 2019, which is neither an improvement nor deterioration compared to previous years.

Capacity:

- Germany did not contribute positively towards FABEC's en route ATFM delay per flight targets in 2019 with 1.49 average Air Traffic Flow Management (ATFM) delay per flight exceeding both the FAB and national targets.
- The number of instrument flight rules (IFR) movements in 2019 was 0.3% lower than in 2018 and the evolution of IFR movements remained between the STATFOR base and high growth forecast throughout RP2.
- Average en route ATFM delay was reduced by 9.7% relative to 2018. ATC capacity caused 56% of total delay, weather caused 21% and ATC staffing caused 16%
- DFS's en route delays were mainly driven by Karlsruhe ACC, which has generated more than two thirds of German delays during 2019. Delays caused by Karlsruhe ACC are mainly due the structural capacity shortage linked with the unforeseen traffic increase since 2016 which intensified further in 2018 because of additional unexpected staff shortages.

Cost-efficiency:

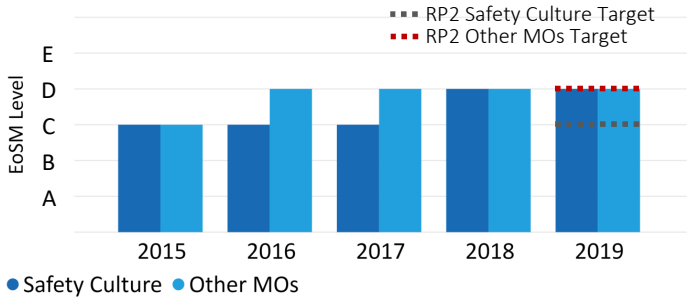
- Germany achieved the en route cost-efficiency target in 2019 with the actual unit cost (51.31€$_{2009}$) being lower than the determined unit cost (58.74€$_{2009}$). Germany achieved the en route cost-efficiency targets in each year of RP2.
- In 2019, en route actual costs were below the determined costs by -1%. En route actual costs show a decrease over the period.
- Germany underspent -8M€$_{2009}$ in CAPEX in 2019 (-175M€$_{2009}$ over RP2). Germany has consistently underspent through the period and has not met the capacity targets in both 2018 and 2019.
- It is not clear why the actual depreciation is higher than the determined one considering the large underspending on investments. Germany explains that higher depreciation is due to the iCAS System, however the project received less funds than planned over the period. More transparency is needed to assess the difference in depreciation.

PRB Performance review body of the single european sky

Germany Factsheet

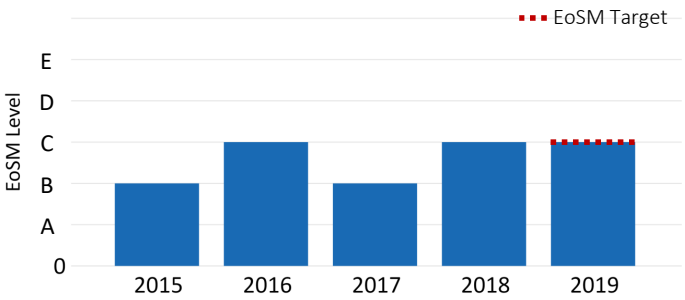
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



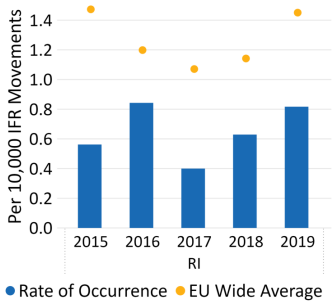
DFS has achieved the targets for the EoSM in all safety areas since 2016.

State Effectiveness of Safety Management (EoSM) by Year

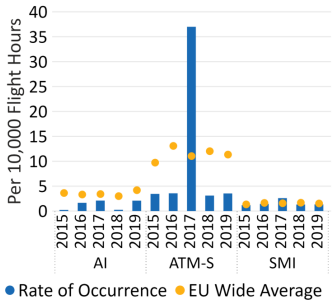


Germany achieved the targets for the EoSM in all safety areas in 2019.

Runway Incursions (RIs) by Year

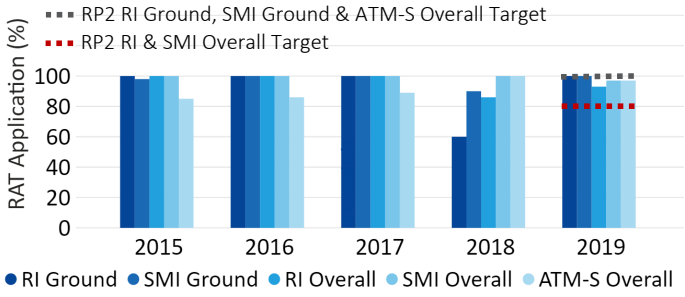


Occurrences by Type and Year



Between 2018 and 2019, RIs, AIs and ATM-S have increased but still remained below the Union-wide average rate.

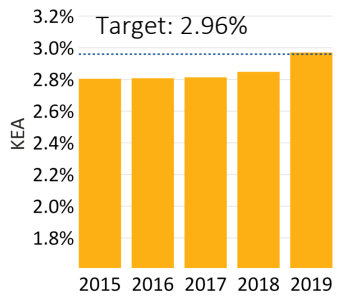
Risk Analysis Tool (RAT) Application to Severity Classification



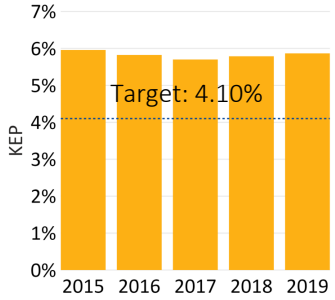
In 2019, DFS achieved the targets for the application of the RAT for severity classification. Germany didn't for ATM-S overall.

Environment

RP2 KEA Performance

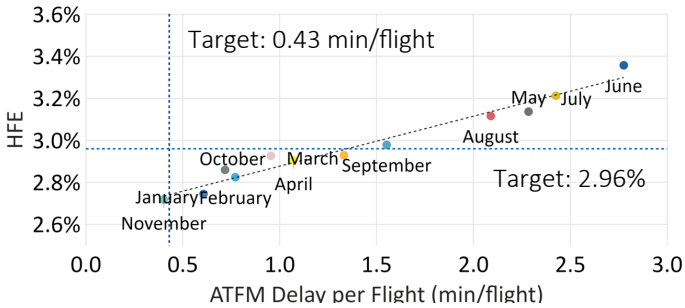


RP2 KEP Performance



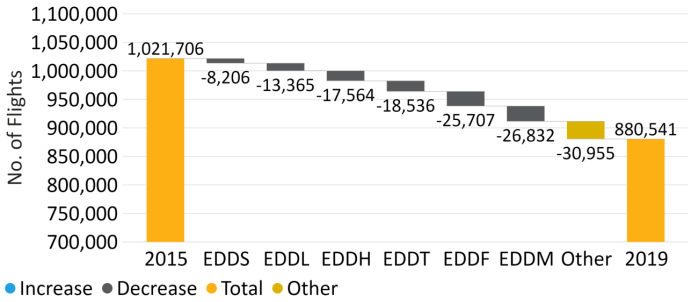
Germany slightly missed achieving the KEA target in 2019. The KEP target was not achieved in any year of RP2.

ATFM Delay per Flight and HFE by Month in 2019



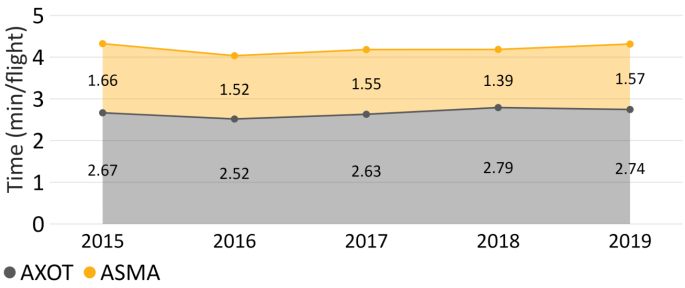
Each minute of additional en route ATFM delay per flight correlated with a circa 0.2% increase in KEA.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations fell at regulated airports during RP2 by 141,165 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



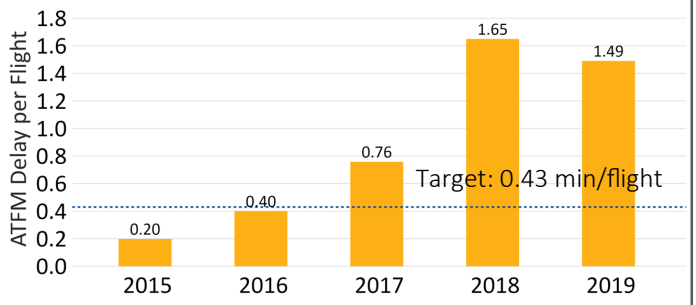
4.31 minutes of AXOT and ASMA was endured by airspace users in Germany (16/16 regulated airports reported data).

PRB Performance review body of the single european sky

Germany Factsheet

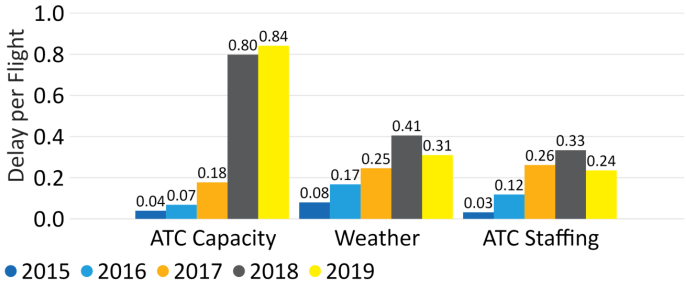
Capacity

ATFM Delay per Flight (min/flight)



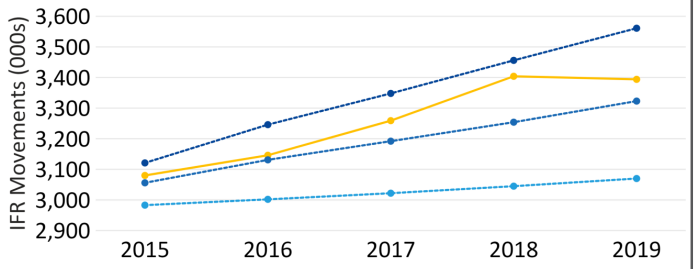
Delays in Germany decreased by 9.7% in 2019 compared to 2018. Germany has not achieved the targets since 2017.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



ATC capacity, weather and staffing were the leading delay reasons contributing 56%, 21% and 16% of the delays respectively.

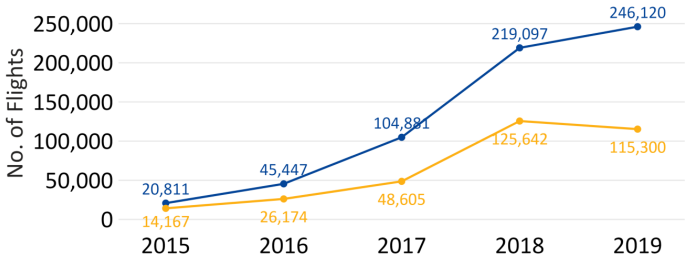
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were 2.1% above the STATFOR February 2014 base forecast and were below the high forecast.

Distribution of Delays (DFS)

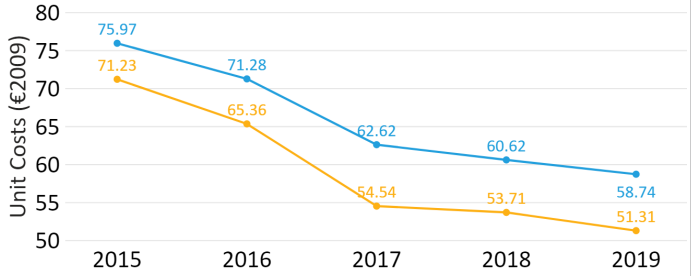


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

DFS delayed 115,300 flights by more than 15 minutes in 2019, which was 32% of all delayed flights.

Cost-efficiency

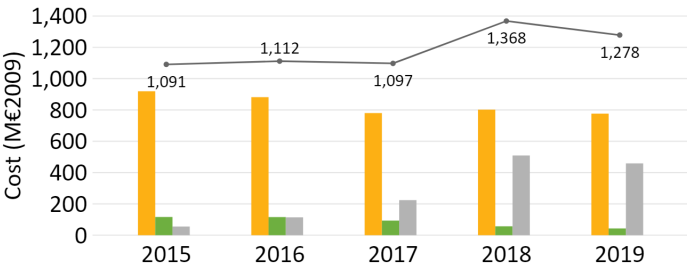
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower in each year of RP2. In 2019, actual unit costs were 12.6% lower than planned.

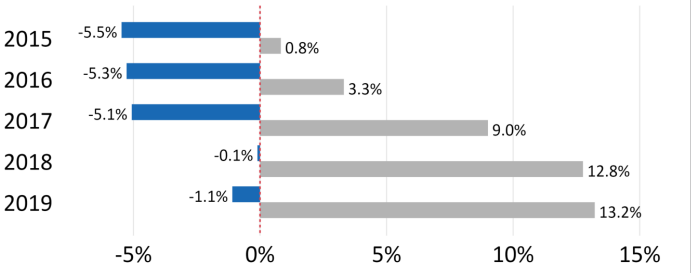
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Germany decreased during 2019 (-6.6%).

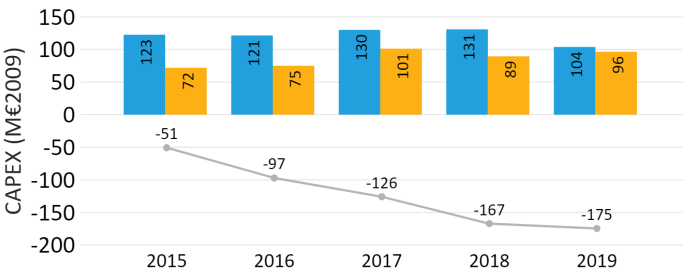
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Lower actual unit costs were fuelled by lower spending between 2015 and 2017 and higher service units thereafter.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Germany accumulated 175M€ of excess revenue that it did not spend on CAPEX as planned.

Comments from the Performance Review Body:

Safety:

- Greece achieved the target level in all Management Objectives (MOs) since 2016.
- HANSP achieved the target level for safety culture since 2015 and for all other MOs since 2017.
- Greece and HANSP achieved the RP2 targets for the application of the Risk Classification Scheme since 2017.
- Occurrence rates stayed below Union-wide averages for all types over RP2. Rates of Runway Incursions (RIs) and Air Traffic Management Specific (ATM-S) improved over RP2, while the rates of Airspace Infringements (AIs) and Separation Minima Infringements (SMIs) increased slightly.

Environment:

- Greece contributed positively towards BLUE MED FAB's actual and planned horizontal flight efficiency environment targets (KEA & KEP respectively) in each year of RP2.
- KEA performance significantly deteriorated between 2015 and 2019, which is surprising since the NSA claimed that routes have become shorter by 3.23% in 2019 due to offering of DCTs.
- Terminal vertical flight efficiency improved in 2019 as more flights completed fully continuous climb/descent at Greece's regulated airport in 2019 compared to 2015.
- On average, airspace users spent 3.91 additional minutes per flight taxiing out or in terminal airspace, which is markedly worse compared to 2015.

Capacity:

- Greece contributed positively towards the en route Air Traffic Flow Management (ATFM) delay per flight targets of BLUE MED FAB in 2019.
- Traffic growth was significantly higher than the STATFOR high scenario. In 2019, instrument flight rules (IFR) movements increased by 6.3% yet total delays decreased by 21% compared to 2018.
- Average en route ATFM delay per flight was 0.42 minutes per flight in 2019. ATC staffing was assigned the delay cause responsibility for most of the delays while ATC capacity issues apparent in 2018 seem to have been resolved.
- The proportion of flights that were delayed by more than 15 minutes remained stable compared in 2019 and was 54.48% of all delayed flights compared to 53.94% in 2018.

Cost-efficiency:

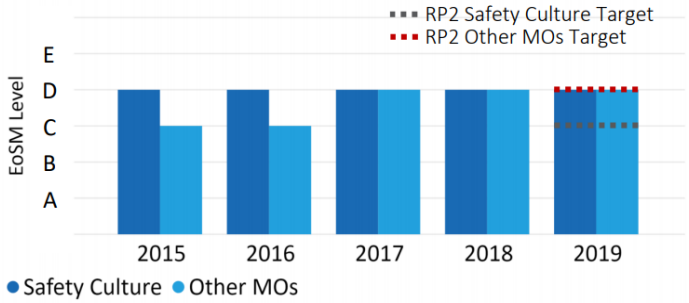
- Greece achieved the en route cost-efficiency target in 2019 with the actual unit cost (21.75€$_{2009}$) being lower than the determined unit cost (31.51€$_{2009}$). Greece achieved the en route cost-efficiency targets in each year of RP2.
- In 2019, en route actual costs were below the determined costs by -9.9%. In 2019, Greece underspent in all the cost categories. Greece has constantly underspent with respect to the performance plan during RP2, generating net gain from the activities.
- In 2019, Greece underspent -20M€$_{2009}$ in CAPEX (-100€$_{2009}$ over RP2).
- As a result of the underinvestment in 2019, Greece charged +12.2M€$_{2009}$ (+28.7M€$_{2009}$ over RP2) in cost of capital and depreciation for investments not materialised. It is imperative for Greece to take into account these amounts when developing the RP3 performance plan.

PRB Performance review body of the single european sky

Greece Factsheet

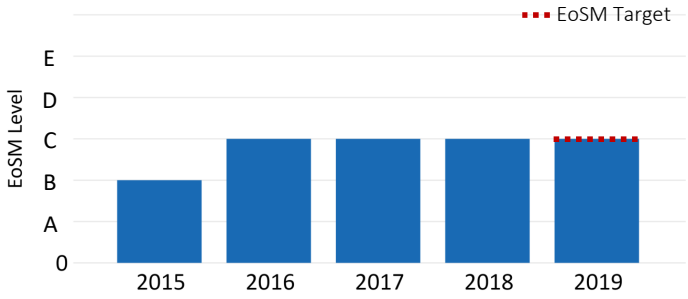
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



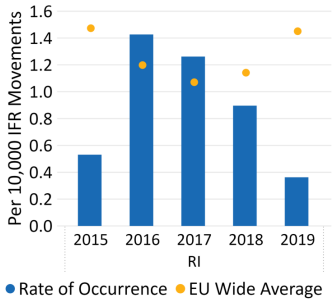
HANSP has achieved the targets for the EoSM in all Management Objectives since 2017.*

State Effectiveness of Safety Management (EoSM) by Year

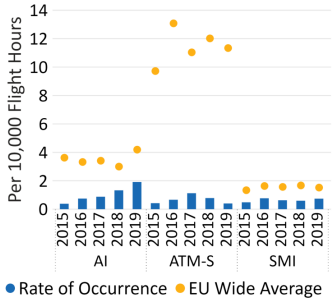


Greece has achieved the targets for the EoSM in all Management Objectives since 2016.

Runway Incursions (RIs) by Year

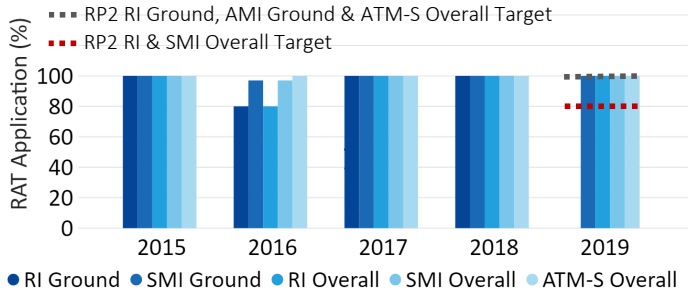


Occurrences by Type and Year



Between 2018 and 2019, AI and SMI occurrences increased. RIs and ATM-S decreased.

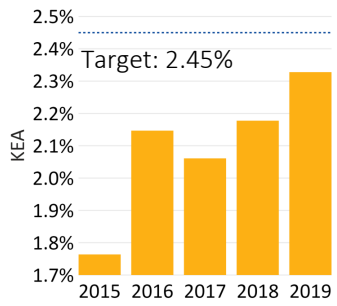
Risk Analysis Tool (RAT) Application to Severity Classification



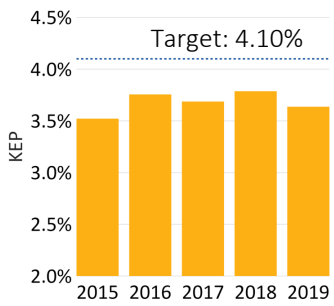
Greece and HANSP achieved the targets for the application of the RAT to severity classification since 2017.

Environment

RP2 KEA Performance

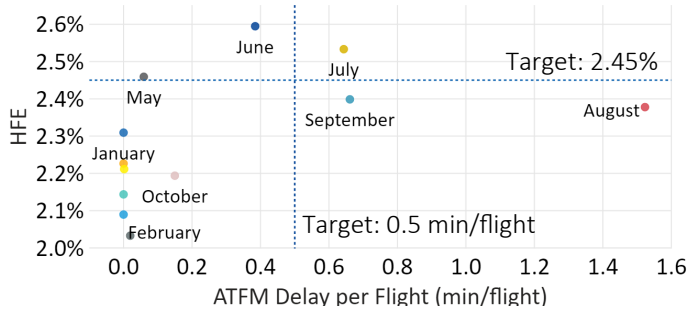


RP2 KEP Performance



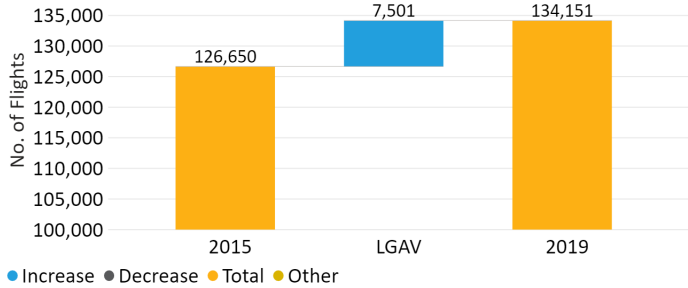
Greece achieved the KEA and KEP targets in each year of RP2, although KEA performance has deteriorated.

ATFM Delay per Flight and HFE by Month in 2019



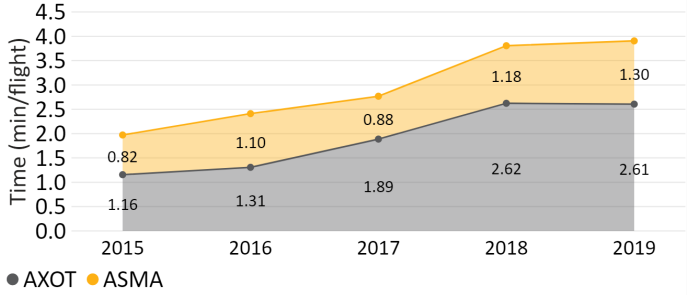
Given that Greece had many months of close to zero delays, no specific correlation exists between KEA and delays.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations increased at LGAV during RP2 by 7,501 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



3.91 minutes of AXOT and ASMA was endured by airspace users in Greece (1/1 regulated airports reported data).

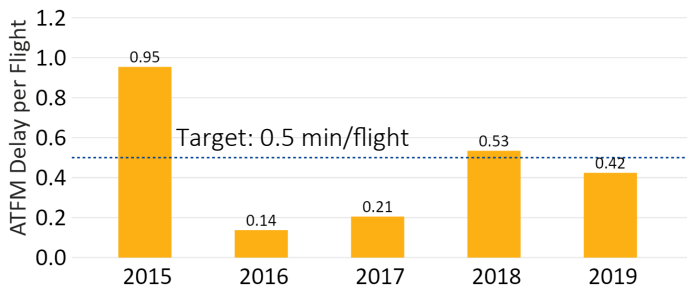
*This figure was updated in edition 2.0 of this document

PRB Performance review body of the single european sky

Greece Factsheet

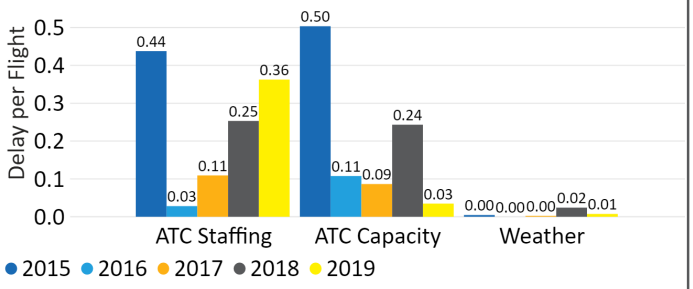
Capacity

ATFM Delay per Flight (min/flight)



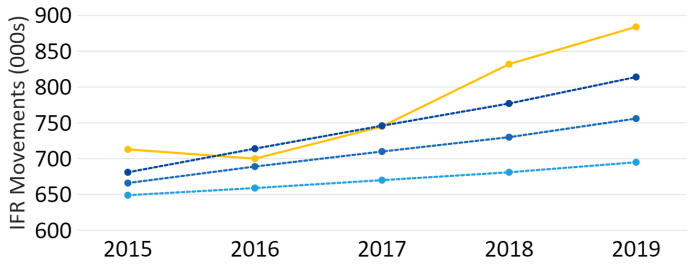
Delays in Greece reduced year-on-year by 21% in 2019. This led to Greece achieving the capacity target.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



Staffing, ATC and weather were the leading delay reasons contributing 86%, 7% and 2% of 2019 delays respectively.

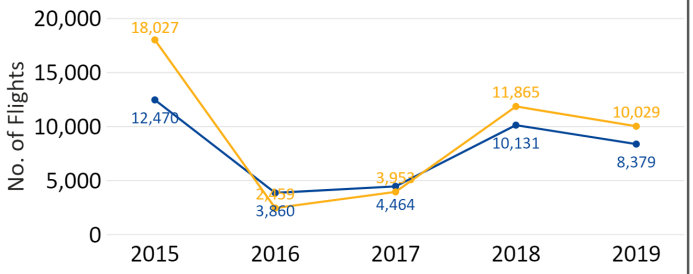
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were 7.9% above the STATFOR February 2014 high forecast.

Distribution of Delays (HCAA)

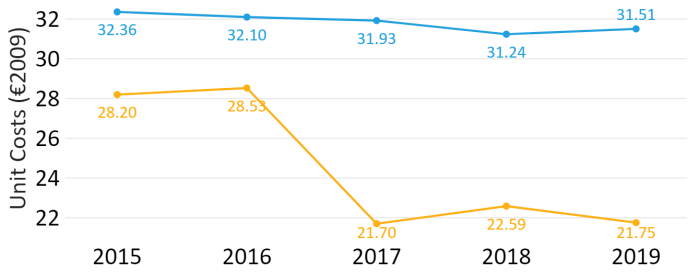


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

HCAA delayed 10,029 flights by more than 15 minutes in 2019, which was 54% of all delayed flights.

Cost-efficiency

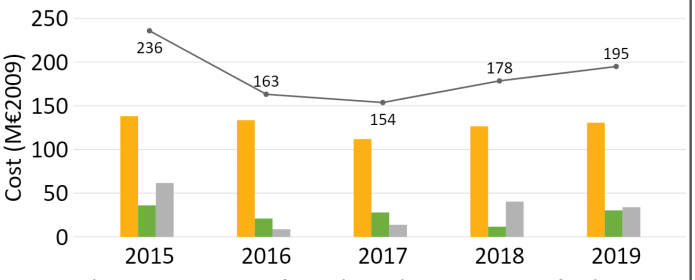
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower in each year of RP2. In 2019, actual unit costs were 31% lower than planned.

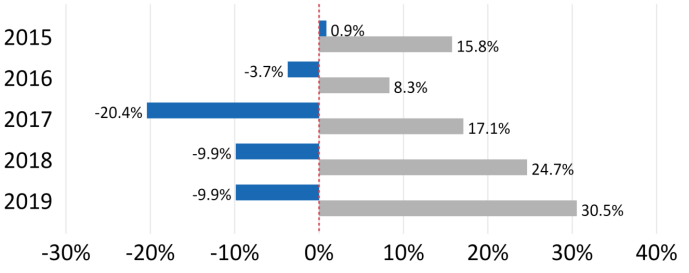
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Greece increased during 2019 (+9.6%).

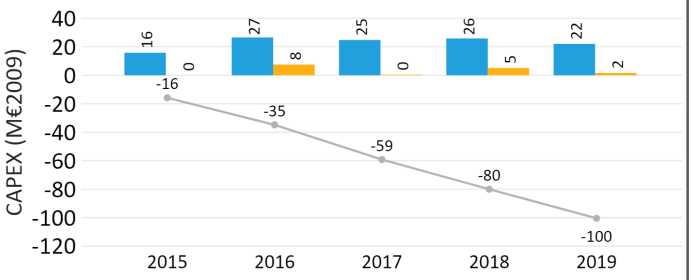
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Lower actual unit costs were fuelled by lower spending after 2015, and higher than planned service units through RP2.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Greece spent 100M€ less than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Hungary achieved the target level in all Management Objectives in 2019.
- Hungarocontrol achieved the target level in all Management Objectives as since 2015.
- Hungary and Hungarocontrol have achieved the RP2 targets for the application of the Risk Classification Scheme in 2019.
- Separation Minima Infringements (SMIs), Airspace Infringements (AI) and Runway Incursions (RIs) occurrences reported show the normal fluctuations and were below the Union-wide average rates in 2019. Air Traffic Management Specific (ATM-S) increased again in 2019 and remain above Union-wide average.

Environment:

- Hungary contributed positively towards FAB CE's actual horizontal flight efficiency environment targets (KEA) and the planned horizontal flight efficiency (KEP) targets were also achieved.
- The targets were not achieved during the summer months (May – August) when capacity issues resulted in longer actual flown routes. KEA and en route delays show a correlation of +0.1% per minute of delay in Hungary, which suggests improving capacity could improve environmental performance.
- Terminal vertical flight efficiency improved as more flights completed fully continuous climb/descent at Budapest Ferenc Liszt airport in 2019 compared to 2015.
- On average, airspace users spent 2.48 additional minutes per flight taxiing out or in terminal airspace which is worse than 2018 and 2015.

Capacity:

- Hungary did not contribute positively to FAB CE's en route Air Traffic Flow Management (ATFM) delay per flight target. For the second year in row, Hungary did not meet the national capacity target of 0.05 minutes per flight and further increased the average ATFM delay per flight from 0.39 minutes (in 2018) to 1.62 minutes per flight in 2019.
- Actual instrument flight rules (IFR) movements remained above the STATFOR February 2014 high growth scenario. The sharp increase in ATFM en route delay did not mirror the slowing down of traffic between 2018 and 2019.
- Hungary was not able to provide required capacity mainly due to staffing issues, although achieved all other operational actions and remedial measures agreed on network level. The 2019 capacity plan provided by Hungary, was 9 - 10% lower than previous year's version, which had already caused average ATFM delays per flight 10 times higher than the national target (0.04 minutes) for 2018. Although staffing issues contributed 3% of total ATFM delays, they were a root cause of the inability to provide required ATC capacity in 2019 as highlighted by Network Manager in the Network Operations Plan (NOP) 2019 - 2024.

Cost-efficiency:

- Hungary achieved the en route cost-efficiency target in 2019 with the actual unit cost (27.78€$_{2009}$) being lower than the determined unit cost (33.23€$_{2009}$). Hungary achieved the en route cost-efficiency targets in each year of RP2.
- In 2019, en route actual costs were above the determined costs by +5%. The difference was mainly due to staff costs (e.g. training and workload) due to the traffic being above the forecast.
- In 2019, Hungary overinvested +2M€$_{2009}$ in CAPEX (+6M€$_{2009}$ over RP2).
- Despite the overinvestments in 2019, Hungary charged +3.6M€$_{2009}$ (+9.5M€$_{2009}$ over RP2) in costs of capital and depreciation. Hungary should take into accounts these amounts when developing the RP3 performance plan.

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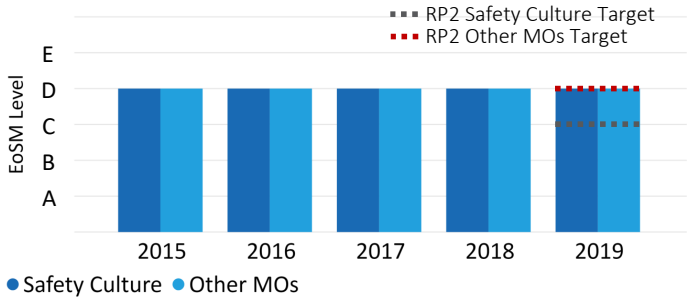
Hungary Factsheet

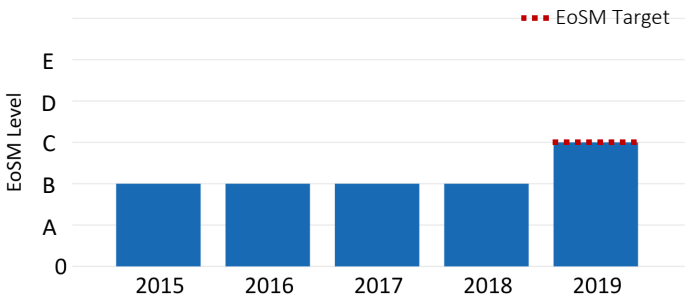
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



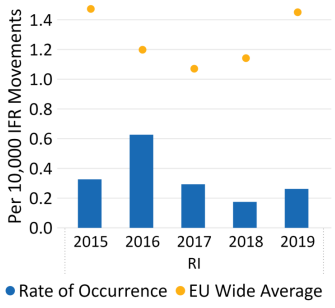
Hungarocontrol has achieved the targets for the EoSM in all Management Objectives areas since 2015.

State Effectiveness of Safety Management (EoSM) by Year

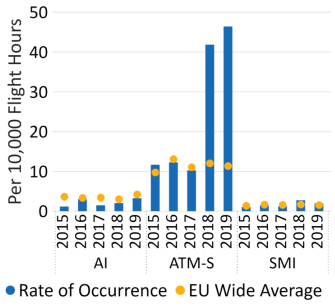


Hungary achieved the targets for the EoSM in all Management Objectives in 2019.

Runway Incursions (RIs) by Year

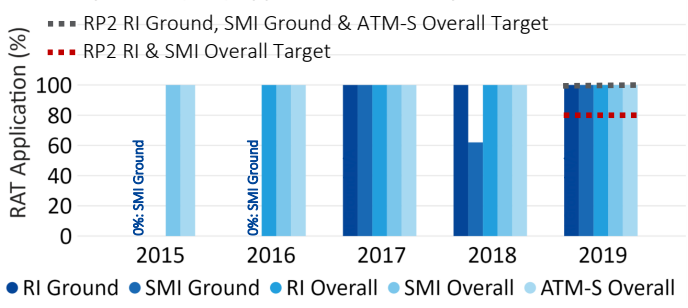


Occurrences by Type and Year



RIs, AIs and SMIs remained at a similar level to 2018. ATM-S occurrences increased in 2019 and remain above Union-wide aver-

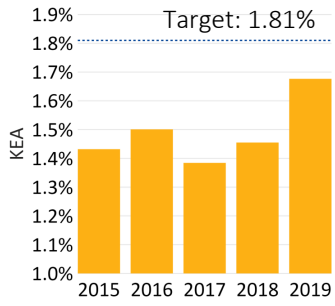
Risk Analysis Tool (RAT) Application to Severity Classification



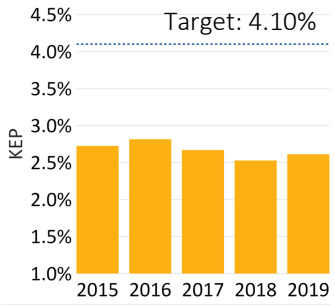
In 2019, Hungary and Hungarocontrol achieved the targets for the application of the RAT to severity classification.

Environment

RP2 KEA Performance

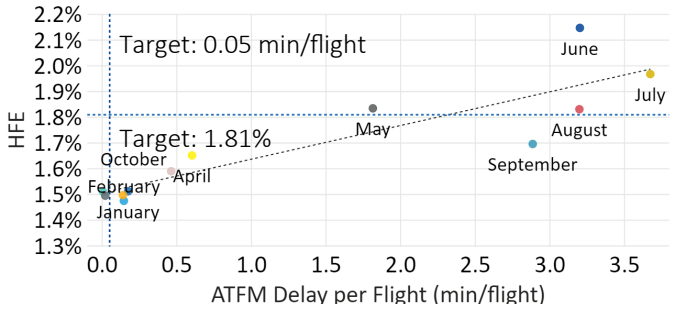


RP2 KEP Performance



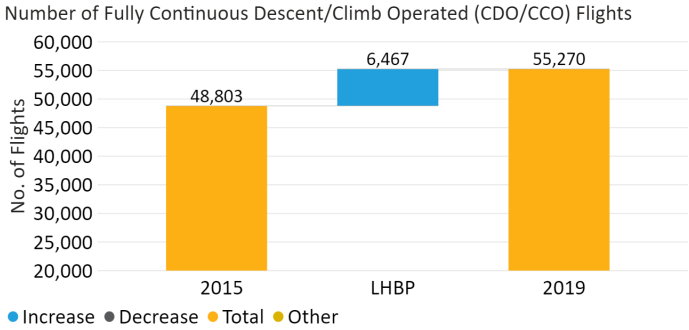
Hungary achieved the KEA and KEP targets in each year of RP2. However, the KEA performance deteriorated in 2019.

ATFM Delay per Flight and HFE by Month in 2019



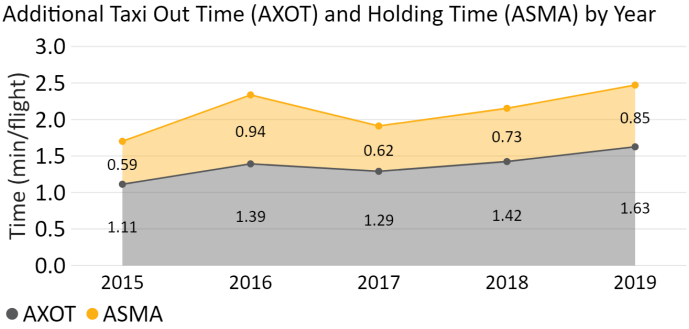
Each minute of additional en route ATFM delay per flight in 2019 correlated with a circa 0.1% increase in HFE.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations increased at LHBP during RP2 by 6,467 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



2.48 minutes of AXOT and ASMA were endured by airspace users in Hungary (1/1 regulated airports reported data).

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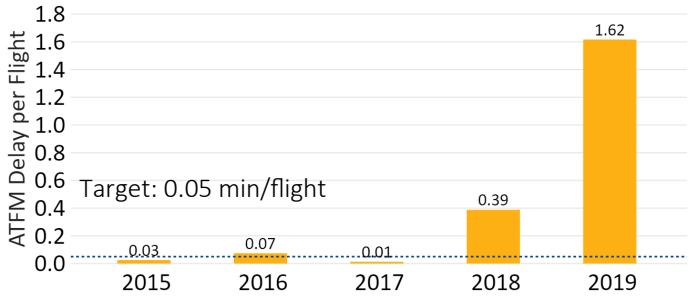
Hungary Factsheet

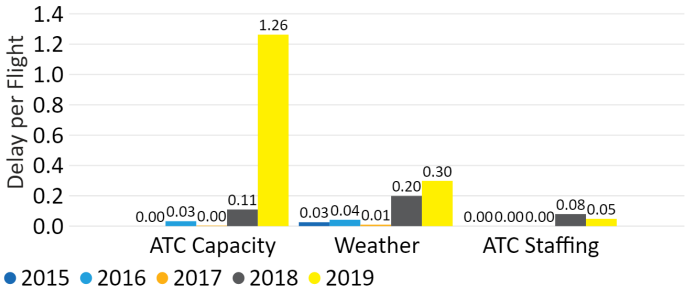
Capacity

ATFM Delay per Flight (min/flight)



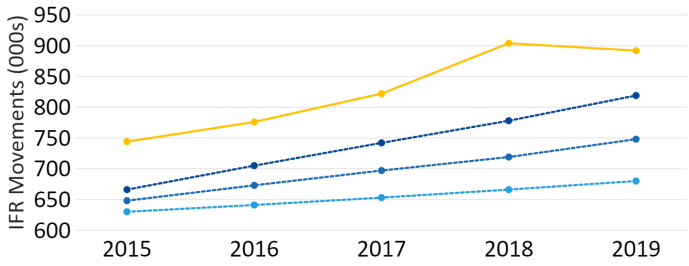
Delays in Hungary increased year-on-year by 315% in 2019. Consequently, Hungary continued to miss the targets in 2019.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



ATC capacity, weather and staffing were the leading delay reasons contributing 78%, 19% and 3% of 2019 delays respectively.

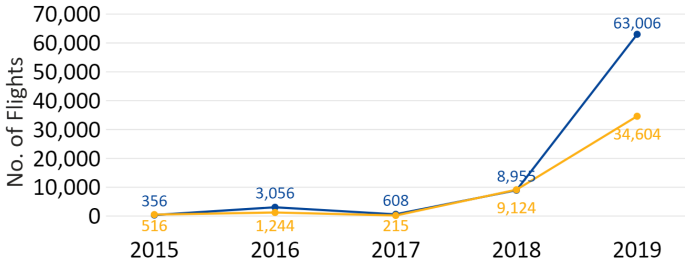
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were 9% above the STATFOR February 2014 high forecast.

Distribution of Delays (HungaroControl)

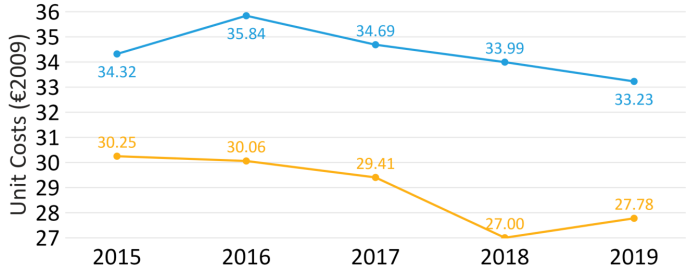


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

Hungarocontrol delayed 34,604 flights by more than 15 minutes in 2019, which was 35% of all delayed flights.

Cost-efficiency

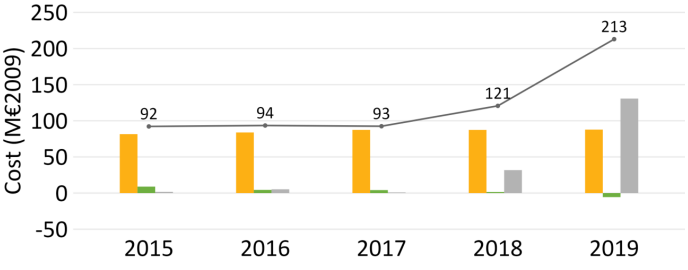
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower than planned in each year of RP2. In 2019, actual unit costs were 16% lower than planned.

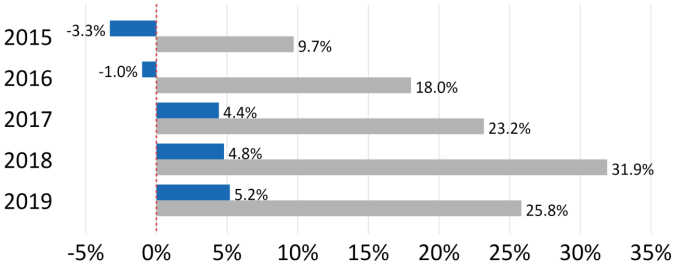
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Hungary increased in 2019 (+76%).

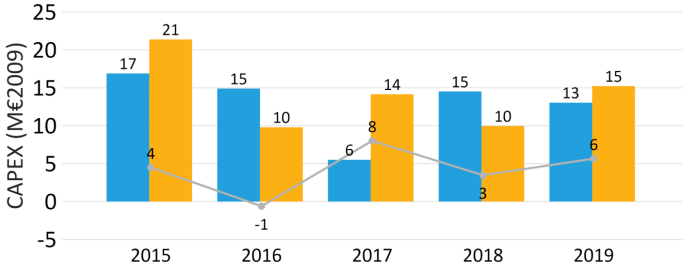
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Lower actual unit costs were fuelled by higher than planned service units in all years of RP2.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Hungary spent 6M€ more than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Ireland has achieved the target level in all Management Objectives (MOs) since 2018.
- IAA achieved the target level for all MOs since 2016.
- Ireland and IAA have achieved the RP2 targets for the application of the Risk Classification Scheme since 2015 and remain above the targets since then.
- The occurrences reported show the normal fluctuations and were continuously below the Union-wide average over RP2. Rate of Runway Incursions (RIs) decreased over RP2.

Environment:

- Ireland contributed positively towards UK-Ireland FAB's actual horizontal flight efficiency environment targets (KEA) and the planned horizontal flight efficiency (KEP) targets were also achieved.
- Since Free Route Airspace (FRA) was introduced below FL245 in November 2017, KEA continued to improve.
- Terminal vertical flight efficiency improved as more flights completed fully continuous climb/descent at all three of Ireland's regulated airports in 2019 compared to 2015.
- On average, airspace users spent 9.69 additional minutes per flight taxiing out or in terminal airspace which is worse than 2018 and 2015. High additional taxi-out and holding times at Dublin airport are a result of infrastructure deficiencies at the aerodrome.

Capacity:

- Ireland contributed positively towards UK-Ireland FAB's en route Air Traffic Flow Management (ATFM) delay per flight targets in 2019 with effectively zero average ATFM delay per flight, remaining below both the FAB (0.26 minutes per flight) and national (0.14 minutes per flight) targets.
- The number of instrument flight rules (IFR) movements in 2019 was 2% higher than in 2018 and the evolution of IFR movements remained above the STATFOR high growth forecast throughout RP2.
- Average en route ATFM delay showed very slight increase during RP2 yet remained well below the target in 2019. 'Other' (63% of total delay) and ATC equipment (33% of total delay) were the main delay causes in 2019.

Cost-efficiency:

- Ireland achieved the en route cost-efficiency target in 2019 with the actual unit cost (23.69€$_{2009}$) being lower than the determined unit cost (27.87€$_{2009}$). Ireland achieved the en route cost-efficiency targets in each year of RP2.
- In 2019, en route actual costs were below the determined costs by –7.5%. The main driver of the difference has been the staff costs due to unforeseen retirements and late recruitment.
- In 2019, Ireland underspent -8M€$_{2009}$ in CAPEX (-64M€$_{2009}$ over RP2). Ireland did not invest around 60% of the planned amounts over RP2. The justification provided is that staff were redeployed from project development in order to manage traffic in operations.
- As a result of the underinvestment, in 2019 Ireland charged +7.6M€$_{2009}$ (+10.1M€$_{2009}$ over RP2) in cost of capital and depreciation for investments not materialised. It is imperative for Ireland to take into accounts these amounts when developing the RP3 performance plan.

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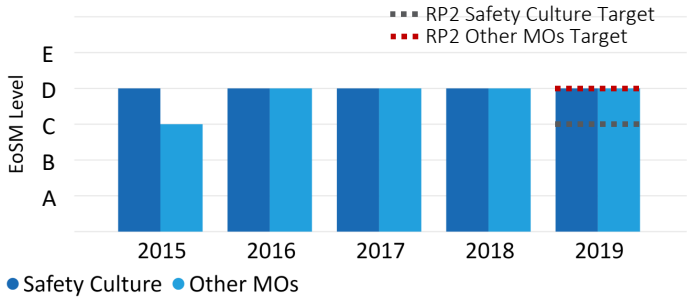
Ireland Factsheet

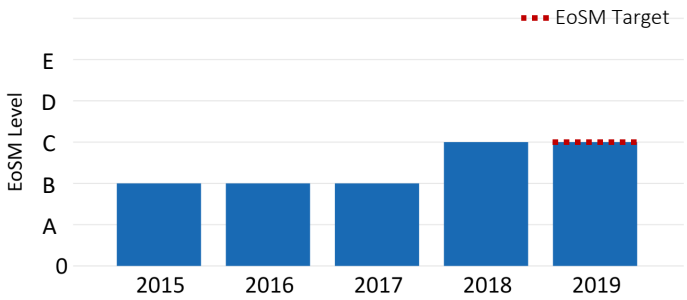
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



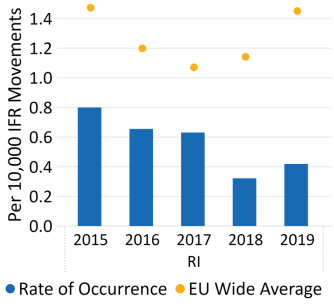
IAA has achieved the targets level for safety culture since 2015 and for other Management Objectives since 2016.

State Effectiveness of Safety Management (EoSM) by Year

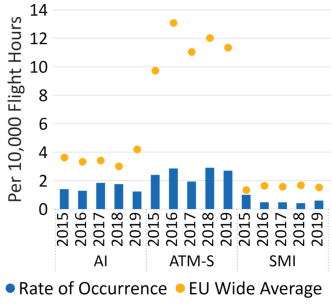


Ireland has achieved the targets for the EoSM in all Management Objectives since 2018.

Runway Incursions (RIs) by Year

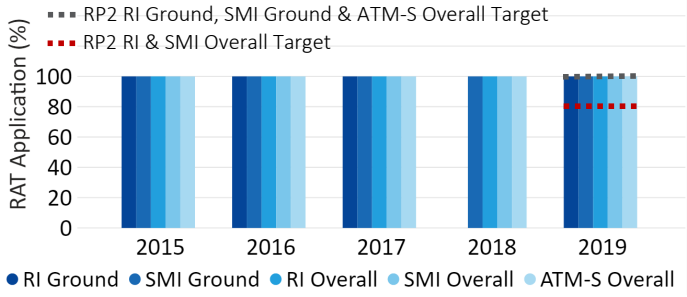


Occurrences by Type and Year



Rates of SMIs, AIs and ATM-s occurrences remained below Union-wide averages in 2019. RIs increased slightly in 2019.

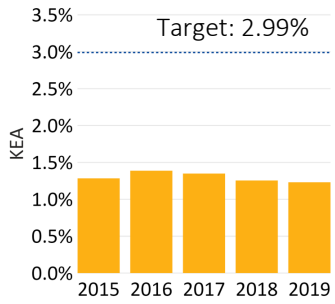
Risk Analysis Tool (RAT) Application to Severity Classification



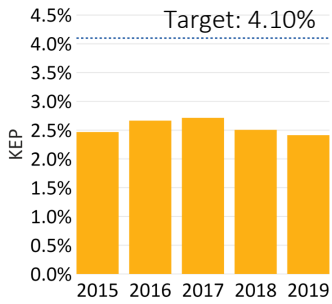
Ireland and IAA achieved the targets for the application of the RAT to severity classification since 2015.

Environment

RP2 KEA Performance

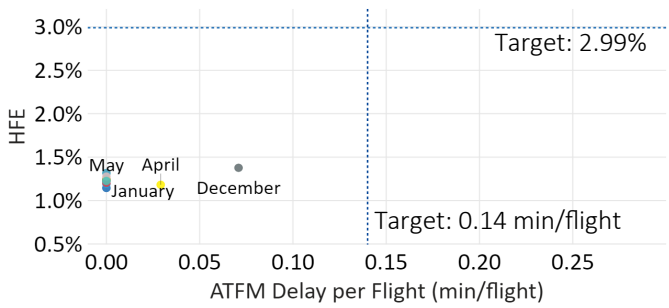


RP2 KEP Performance



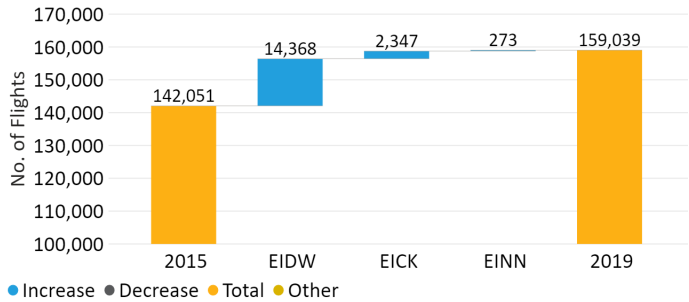
Ireland achieved its KEA and KEP targets in each year of RP2 and achieved the best KEA and KEP performances of RP2 in 2019.

ATFM Delay per Flight and HFE by Month in 2019



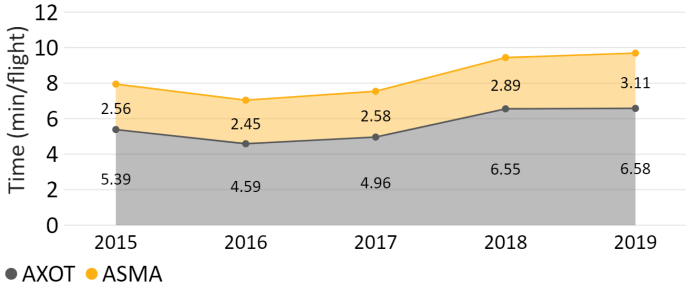
Given that Ireland had many months of close to zero delays, no specific correlation exists between KEA and delays.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations increased at regulated airports during RP2 by 16,988 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



9.69 minutes of AXOT and ASMA was endured by airspace users in Ireland (2/3 regulated airports reported data).

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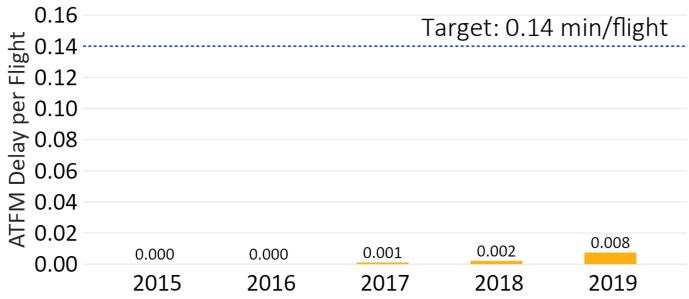
Ireland Factsheet

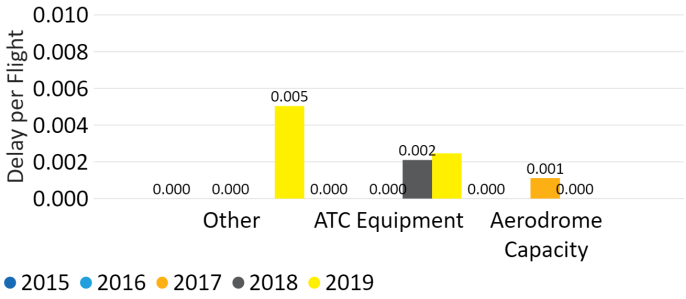
Capacity

ATFM Delay per Flight (min/flight)



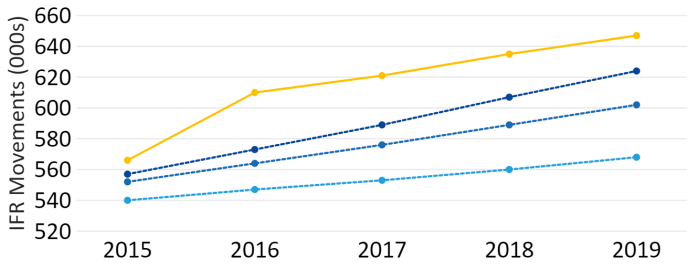
Delays in Ireland remained low and the target was achieved in 2019.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



The 'other' and 'aerodrome capacity' delay codes were used as reasons to explain the minimal delays in 2019.

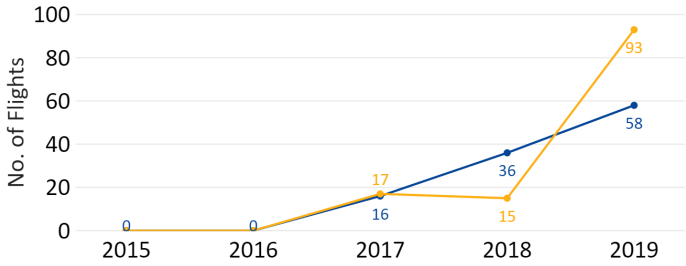
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

2019 IFR movements were 4% above the STATFOR February 2014 high forecast. Traffic was above the high forecast in all years.

Distribution of Delays (IAA)

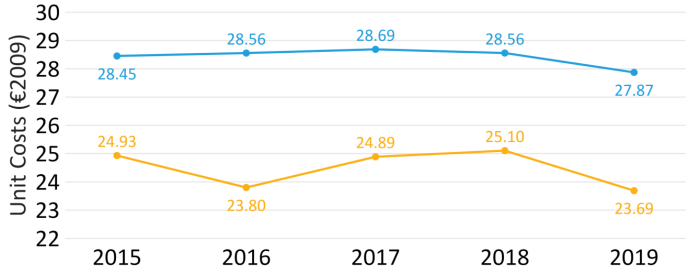


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

IAA delayed 93 flights by more than 15 minutes in 2019, which was 62% of all delayed flights.

Cost-efficiency

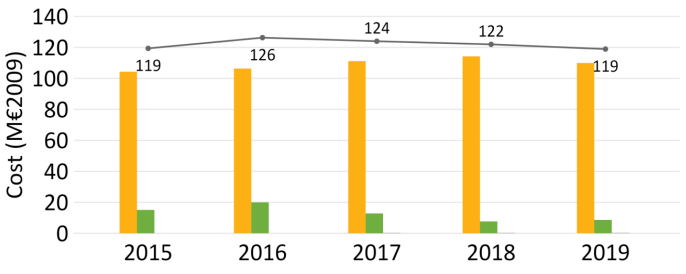
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower than planned in each year of RP2. In 2019, actual unit costs were 15% lower than planned.

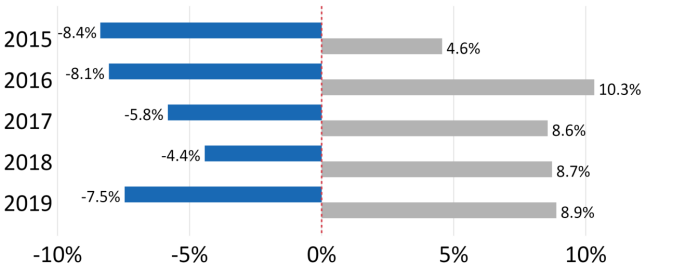
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Ireland decreased in 2019 (-2%).

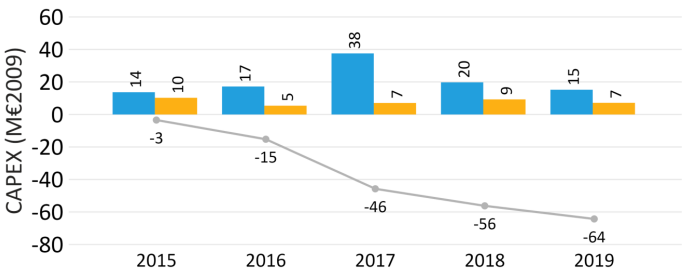
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Lower actual unit costs were fuelled by lower spending and higher service units than planned in each year of RP2.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Ireland spent 64M€ less than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Italy did not achieve the RP2 targets for the Effectiveness of Safety Management (EoSM) in 2019 and did not improve the minimum level over RP2.
- ENAV achieved the target for the EoSM for all Management Objectives in 2019.
- Italy and ENAV have, except for Separation Minima Infringements (SMI) ground in 2018, achieved the RP2 targets for the application of the Risk Classification Scheme since 2016.
- The rate of Runway Incursions (RIs) show significant increase over RP2 and were above the Union-wide average in 2018 and 2019. The rate of Airspace Infringements (AIs) and Air Traffic Management Specific (ATM-S) showed normal fluctuations and were generally below the Union-wide average over RP2. The rate of SMIs peaked in 2018 but fell back in 2019 to be close to the Union-wide average.

Environment:

- Italy did not contribute positively towards BLUE MED FAB's actual horizontal flight efficiency environment targets (KEA) in any year of RP2, and did not achieve the planned horizontal flight efficiency (KEP) targets either. However, KEA performance improved in 2017 so that overall in RP2, Italy came closer to achieving the targets. Free routes were offered to airspace users at the end of 2016 above FL335 and further lowering this could improve performance.
- Terminal vertical flight efficiency did not improve in RP2 as less flights completed fully continuous climb/descent regulated Italian airports overall in 2019 compared to 2015. On average, airspace users spent 7.01 additional minutes per flight taxiing out or in terminal airspace. The additional time has steadily increased in each year since 2017.

Capacity:

- Italy contributed positively towards reaching BLUE MED FAB's en route Air Traffic Flow Management (ATFM) delay per flight, consistently achieving better performance – with almost zero delays.
- Traffic growth was between the STATFOR base and high scenarios for the second year in a row in 2019. Despite a 4.4% year on year increase in instrument flight rules (IFR) movements in 2019, total delays decreased by -38% compared to 2018.ATC strikes and weather were the two drivers behind the delays, none of them being especially significant.
- In 2019, the proportion of flights that were delayed by more than 15 minutes remained stable compared to 2018 and was 60% of all delayed flights.

Cost-efficiency:

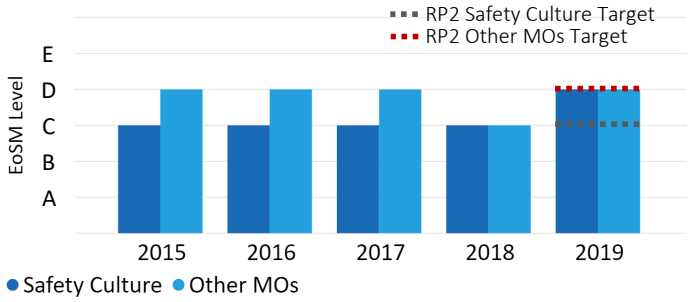
- Italy achieved the en route cost-efficiency target in 2019, with the actual unit cost (56.80€$_{2009}$) being lower than the determined unit cost (61.05€$_{2009}$). Italy achieved the en route cost-efficiency targets over RP2, with the exception of 2015 and 2016.
- In 2019, en route actual costs were lower than the determined costs by -5.6%. The difference was mainly due to less than planned staff costs and 'other' operating costs, where several cost containment measures have been implemented. En route actual costs decreased over the period.
- In 2019, Italy underspent -4M€$_{2009}$ in CAPEX (-143M€$_{2009}$ over RP2). Italy has consistently underspent with respect to the performance plan. The source of variation in the asset base reported is unclear since Italy is not reporting the fully operational date of its investments. Italy should transparently report the information regarding the asset base. As a result of the underinvestment, Italy charged +38.8M€$_{2009}$ over RP2 in costs of capital and depreciation for investments not materialised. Italy should take into account these amounts when developing the RP3 performance plan.

PRB Performance review body of the single european sky

Italy Factsheet

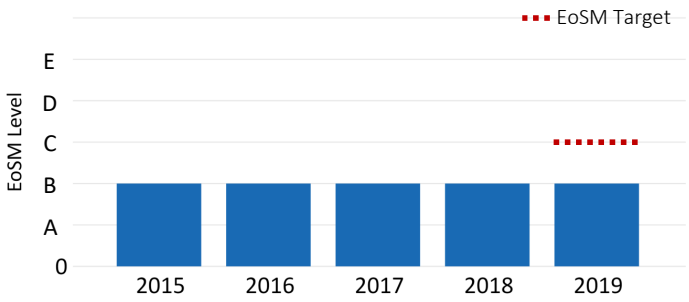
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



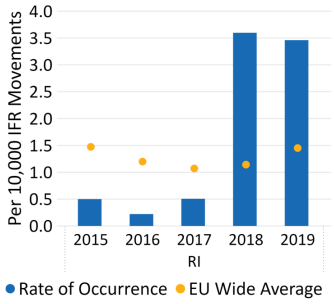
ENAV achieved the targets for all Management Objectives in 2019.

State Effectiveness of Safety Management (EoSM) by Year

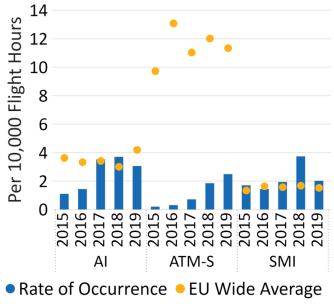


ENAV achieved the target for the Effectiveness of Safety Management for all MOs in 2019.

Runway Incursions (RIs) by Year

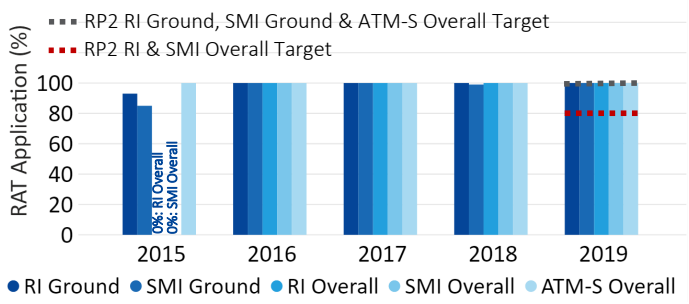


Occurrences by Type and Year



RIs and SMI rates remained above the Union-wide average. AIs rates and ATM-S occurrences were below the Union-wide rates.

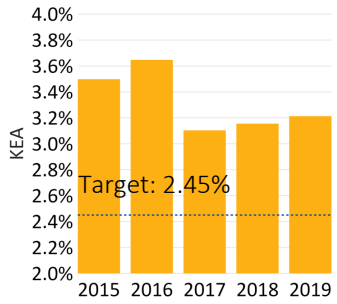
Risk Analysis Tool (RAT) Application to Severity Classification



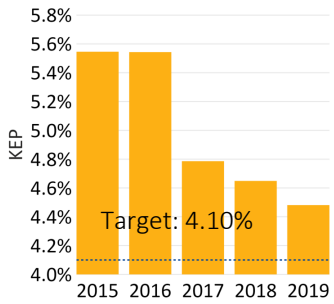
In 2019, Italy and ENAV achieved the targets for the application of the RAT to severity classification.

Environment

RP2 KEA Performance

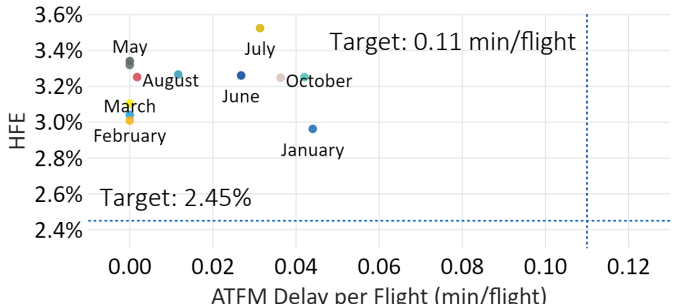


RP2 KEP Performance



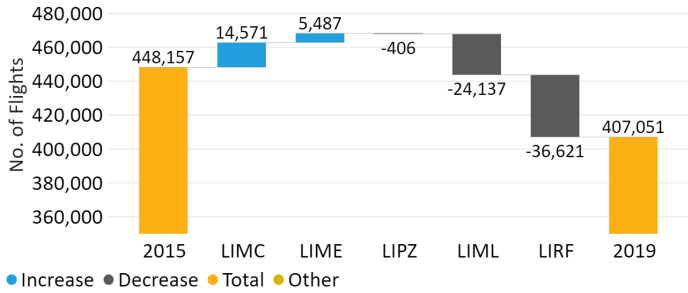
Although Italy improved its KEA and KEP performance in RP2, it did not achieve the targets in any year of RP2.

ATFM Delay per Flight and HFE by Month in 2019



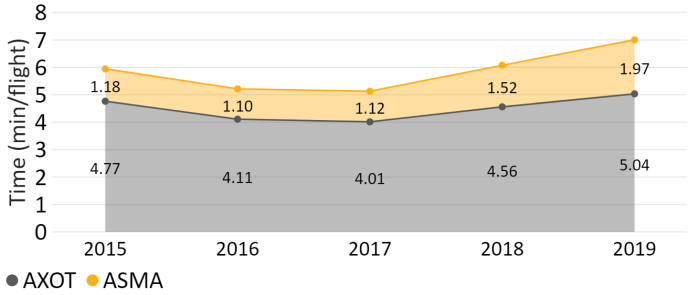
No specific correlation between delays and KEA was evident from the 2019 data.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations fell at regulated airports during RP2 by 41,106 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



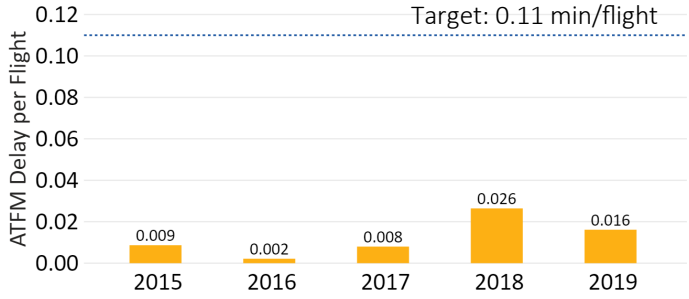
7.01 minutes of AXOT and ASMA was endured by airspace users in Italy (5/5 regulated airports reported data).

PRB Performance review body of the single european sky

Italy Factsheet

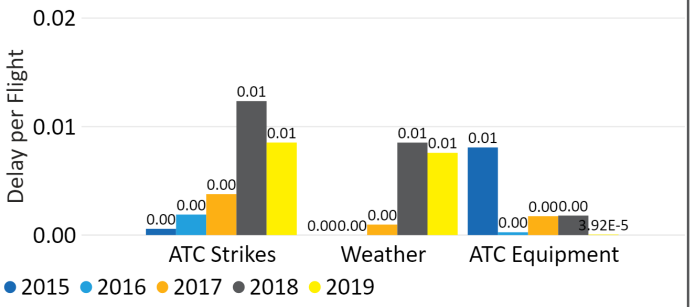
Capacity

ATFM Delay per Flight (min/flight)



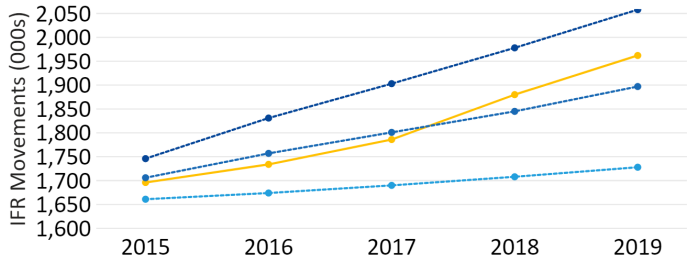
Delays in Italy remained low and continued to achieve the capacity target in 2019.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



The cause of the minimal delays in 2019 were due to strikes, weather and ATC Equipment issues.

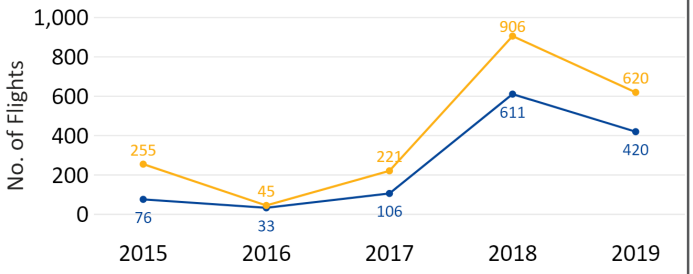
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were 3.4% above the STATFOR February 2014 base forecast and remained below the high forecast.

Distribution of Delays (ENAV)

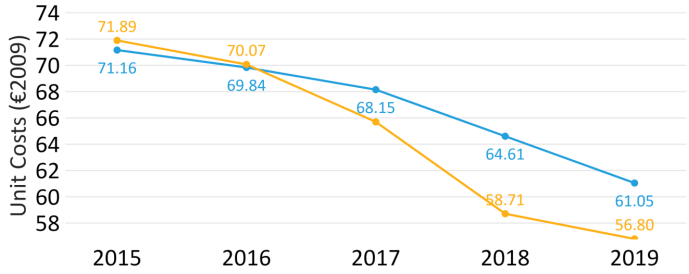


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

ENAV delayed 620 flights by more than 15 minutes in 2019, which was 60% of all delayed flights.

Cost-efficiency

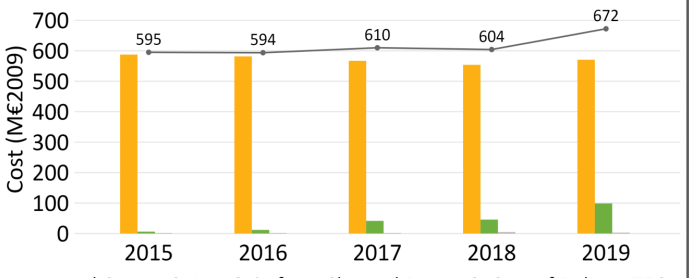
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs moved above and below the planned unit costs in RP2. In 2019, actual unit costs were 7% lower than planned.

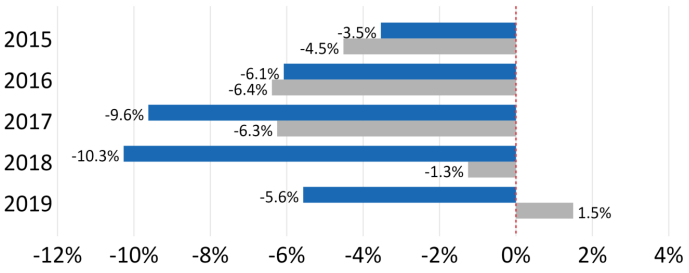
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Italy increased in 2019 (+11%).

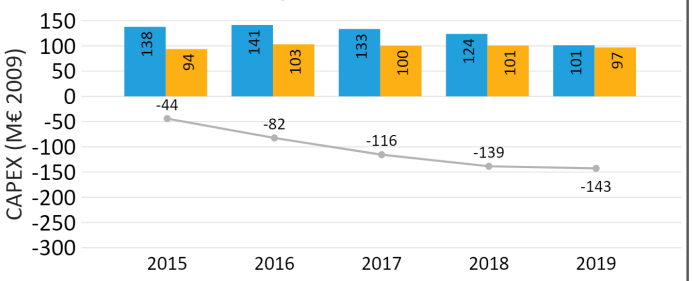
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Other than 2019, actual service units and spending was lower than planned in Italy.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Italy spent 143M€ less than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Latvia achieved the target level in all Management Objectives since 2018.
- In 2019, LGS did not achieve the RP2 target for other Management Objectives in 2019 due to one question. LGS achieved the target for safety culture since 2015.
- In 2019, LGS achieved the targets for the application of the Risk Analysis Tool (RAT) to severity classification.
- Latvia remained below Union-wide rates throughout RP2. Occurrence rates over RP2 show normal fluctuations.

Environment:

- Latvia did not contribute positively towards NEFAB's actual horizontal flight efficiency environment targets (KEA) although the planned horizontal flight efficiency (KEP) targets were achieved.
- KEA performance worsened in each year of RP2 despite the offering of free route airspace. Both the NSA and ANSP consider there are limited measures that could be taken to improve the situation. However, the shortest constrained route in Latvia has worsened since 2015, thus improving airspace availability should help.
- Terminal vertical flight efficiency improved as more flights completed fully continuous climb/descent at Latvia's regulated airports in 2019 compared to 2015.
- Terminal performance worsened with airspace users spending 4.33 additional minutes per flight taxiing out or in terminal airspace, which is worse than in 2015 but stable compared to 2018.

Capacity:

- In 2019, Latvia contributed positively to NEFAB's capacity targets by achieving 0.01 minutes of average Air Traffic Flow Management (ATFM) en route delay per flight compared to the 2019 national target of 0.04 minutes per flight.
- Actual instrument flight rules (IFR) movements were slightly above the STATFOR February 2014 base scenario, which was a slow down as compared to the traffic trends' increase experienced between 2016 and 2018.
- Although the weather is presented as the main cause of the delays in 2019, it is difficult to uniquely identify the real cause due to the very low value of average ATFM en route delay. It appears that the staffing issue peak experienced in 2018 has been well managed in 2019.

Cost-efficiency:

- Latvia achieved the en route cost-efficiency target in 2019 with the actual unit cost (21.25€$_{2009}$) being lower than the determined unit cost (23.88€$_{2009}$).
- In 2019, en route actual costs were below the determined costs by -4.3%. Actuals costs increased over the period but always remaining below the determined.
- In 2019, Latvia overinvested 1M€$_{2009}$ in CAPEX (underspending -1M€$_{2009}$ over RP2). Latvia almost closed the gap generated in the first years of the period, by catching up with the planned investments.
- Latvia charged +8.3M€$_{2009}$ over RP2 in cost of capital and depreciation for investments not materialised. Latvia should take into accounts these amounts when developing the RP3 performance plan.

PRB Performance review body of the single european sky

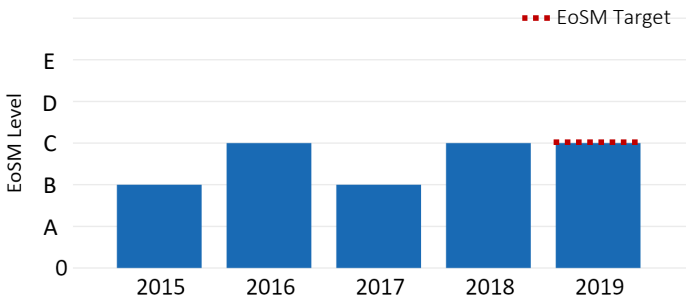
Latvia Factsheet

Safety

ANSP Effectiveness of Safety Management (EoSM) by Year

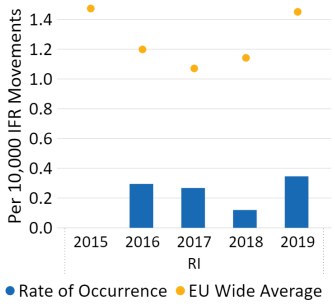
LGS did not achieve the RP2 target for other Management Objectives in 2019 but achieved the target for safety culture since 2015.

State Effectiveness of Safety Management (EoSM) by Year

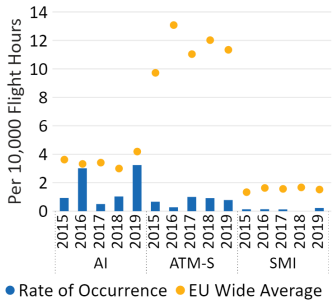


Latvia achieved the targets for the EoSM in all safety areas in 2016 and then since 2018.

Runway Incursions (RIs) by Year

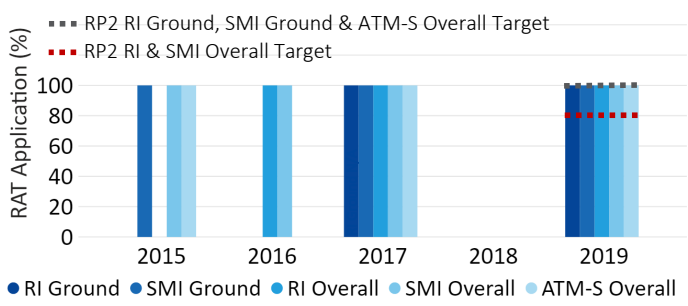


Occurrences by Type and Year



Latvia's rates of occurrences remained below Union-wide rates throughout RP2.

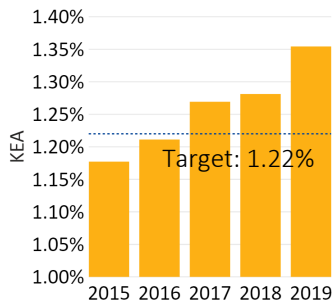
Risk Analysis Tool (RAT) Application to Severity Classification



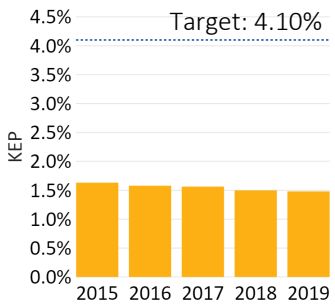
Latvia and LGS achieved the targets for the application of the RAT to severity classification in 2019.

Environment

RP2 KEA Performance

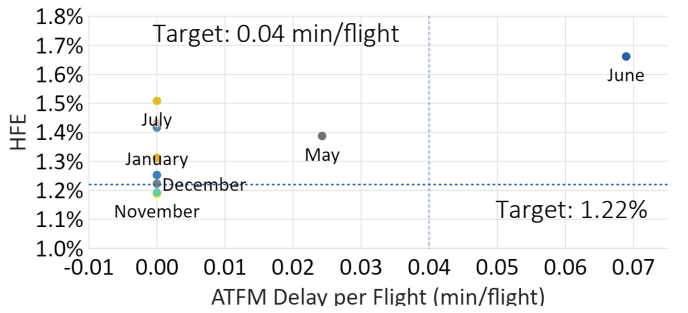


RP2 KEP Performance



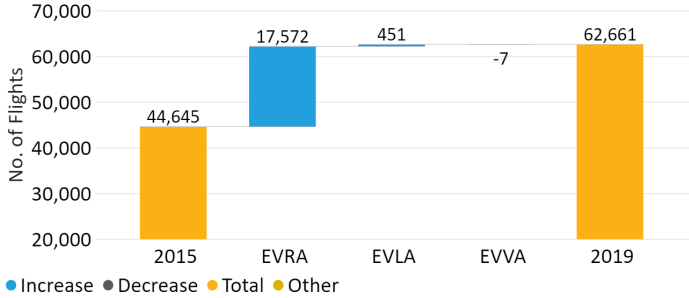
Latvia did not achieve the KEA target in 2019. The KEP targets were achieved in each year of RP2.

ATFM Delay per Flight and HFE by Month in 2019



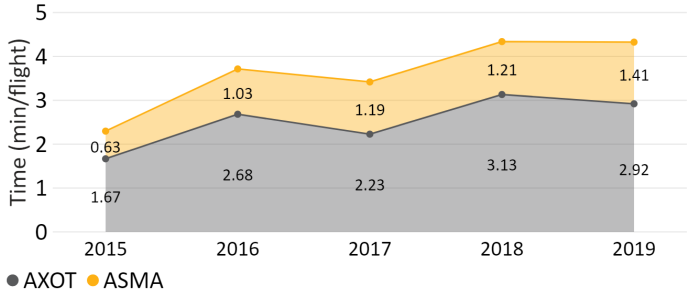
Given that Latvia had many months of close to zero delays, no specific correlation exists between KEA and delays.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations increased at regulated airports during RP2 by 18,016 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



4.33 minutes of AXOT and ASMA was endured by airspace users in Latvia (1/3 regulated airports reported data).

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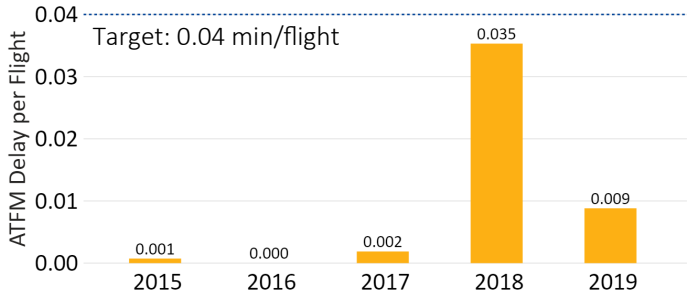
Latvia Factsheet

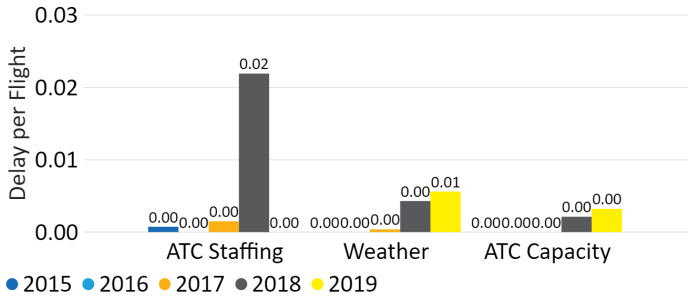
Capacity

ATFM Delay per Flight (min/flight)



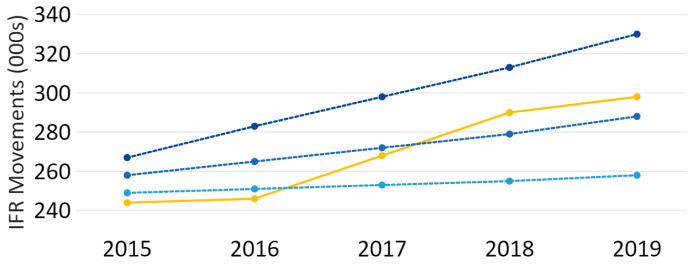
Delays in Latvia reduced in 2019 and continued to achieve the capacity target for 2019.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



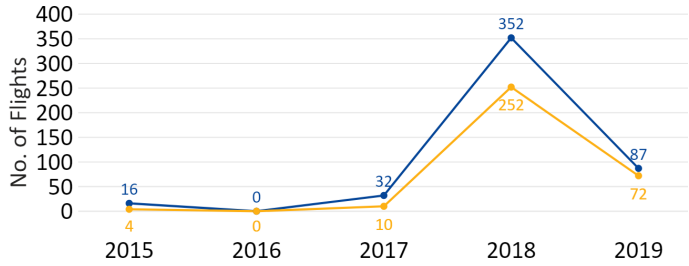
Weather was the main reason behind the delays in 2019.

IFR Movements by Year and Forecast Type (STATFOR February 2014)



IFR movements in 2019 were 4% above the STATFOR February 2014 base forecast and remained below the high forecast.

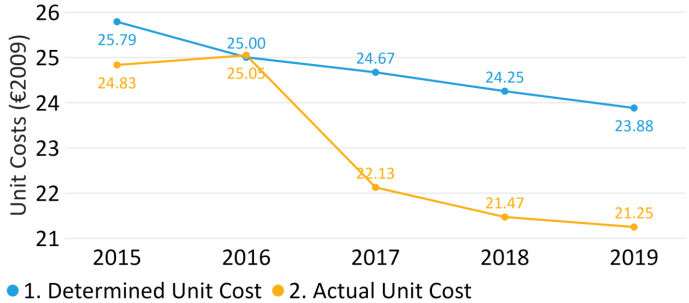
Distribution of Delays (LGS)



LGS delayed 72 flights by more than 15 minutes in 2019, which was 45% of all delayed flights.

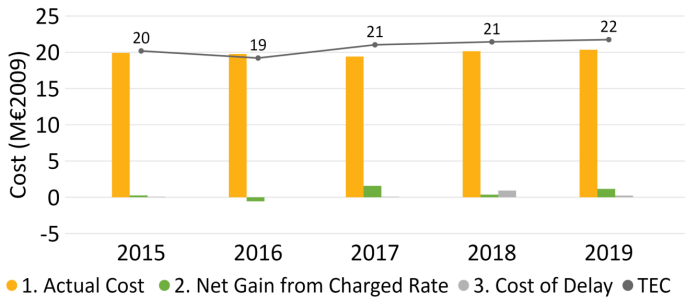
Cost-efficiency

Determined and Actual Unit Costs by Year



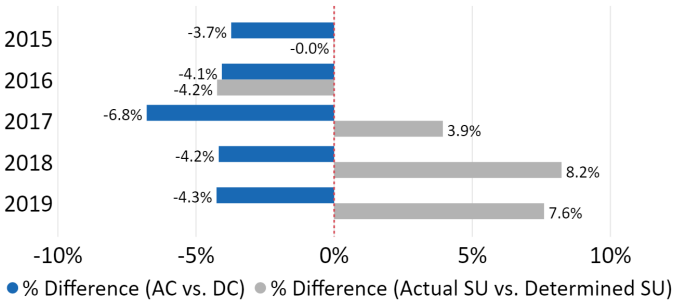
Actual unit costs were lower than planned in RP2 other than in 2016. In 2019, actual unit costs were 11% lower than planned.

Total Economic Cost (TEC) and Cost Components by Year



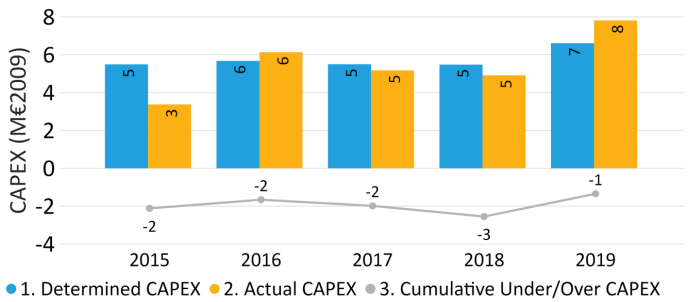
The year-on-year total economic cost for airspace users to use air navigation services in Italy increased in 2019 (+5%).

% Difference between Actual and Determined Costs and Service Units by Year



Lower actual unit costs were fuelled by lower spending in each year of RP2 and higher than planned service units after 2016.

Determined and Actual CAPEX by Year with Cumulative Difference



Latvia spent 1M€ less than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Lithuania did not achieve the RP2 targets for the Effectiveness of Safety Management (EoSM) in 2019 and did not improve the minimum level over RP2.
- Oro Navigacija achieved the target level for all Management Objectives since 2015.
- Lithuania and Oro Navigacija have achieved the RP2 targets for the application of the Risk Classification Scheme in 2019.
- The rate of Airspace Infringements (AIs), ATM-S and Separation Minima Infringements (SMIs) show the normal fluctuations and were continuously below the Union-wide rate over RP2. The rate of Runway Incursions (RIs) peaked in 2017 but fell back in 2018 and 2019 to be well below the Union-wide rate.

Environment:

- Lithuania did not contribute positively towards Baltic FAB's actual horizontal flight efficiency environment targets (KEA) in each year of RP2. However, the planned horizontal flight efficiency (KEP) targets were achieved in every year of RP2.
- The NSA monitoring report states the same reasons as 2018 for missing the KEA targets i.e. traffic bypassing the Ukrainian airspace, increased military activities, enhanced Network Measures (eNM), differences in unit rates between Lithuania and Germany, and adverse weather.
- However, eNM measures were applied during the summer whereas the data shows that Lithuania was unable to achieve the KEA targets in every month of 2019. At the same time, Lithuania claimed that its flexible use of airspace (FUA) activities are optimised and no further room for improvement remains, but it then goes on to explain that reviewing the structuring of its airspace could help.
- Terminal vertical flight efficiency improved as more flights completed fully continuous climb/descent at Lithuania's regulated airports in 2019 compared to 2015.
- Only one out of four regulated airports supplied ground terminal environmental data in 2019.

Capacity:

- Lithuania recorded zero minutes of average en route Air Traffic Flow Management (ATFM) delay per flight in each year of RP2, thus contributing positively towards the Baltic FAB targets.
- Traffic growth was slightly below the STATFOR base scenario, with an increase of 1.02% in instrument flight rules (IFR) movements, compared to 2018. This had no effect on the delays.
- Since there were no delays whatsoever, both delay code distribution and the analysis of the proportion of longer than 15 minute delays are irrelevant.

Cost-efficiency:

- Lithuania achieved the en route cost-efficiency target in 2019 with the actual unit cost (32.29€$_{2009}$) being lower than the determined unit cost (37.20€$_{2009}$). Lithuania achieved the en route cost-efficiency targets from 2017.
- In 2019, en route actual costs were below the determined costs by -4%. Increases against the plan in the costs of capital (due to an increase in the asset base) was out-weighted by savings in the other cost categories.
- In 2019, Lithuania overspent +1M€$_{2009}$ in CAPEX (+11M€$_{2009}$ over RP2). The overspending is mainly due to delays and cost increases in its new Area Control Centre building.

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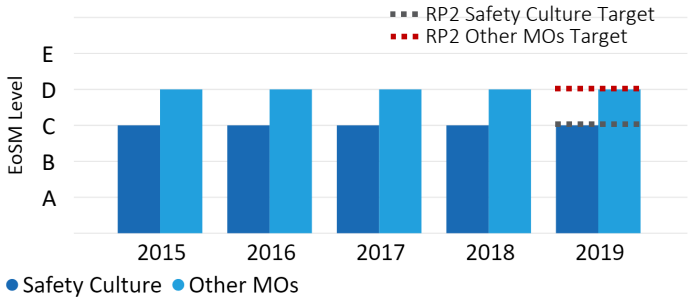
Lithuania Factsheet

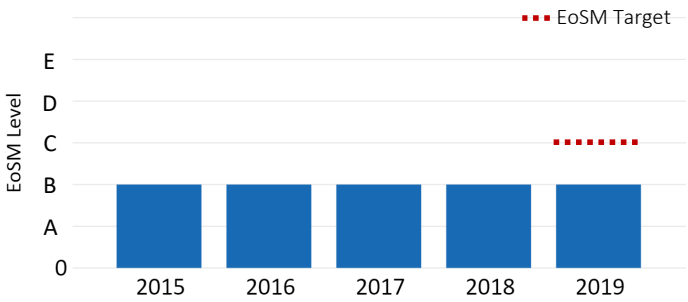
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



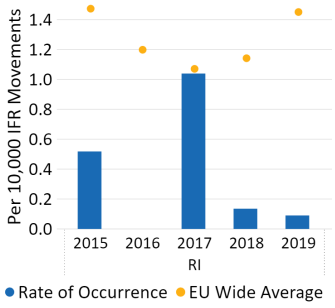
Oro Navigacija has achieved the targets for the EoSM in all Management Objectives since 2015.

State Effectiveness of Safety Management (EoSM) by Year

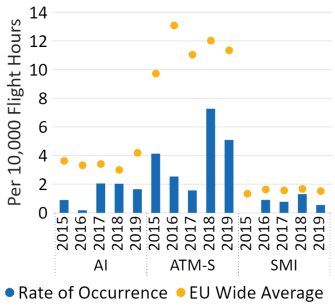


Lithuania did not improve its minimum EoSM level during RP2 and did not achieve the 2019 target.

Runway Incursions (RIs) by Year

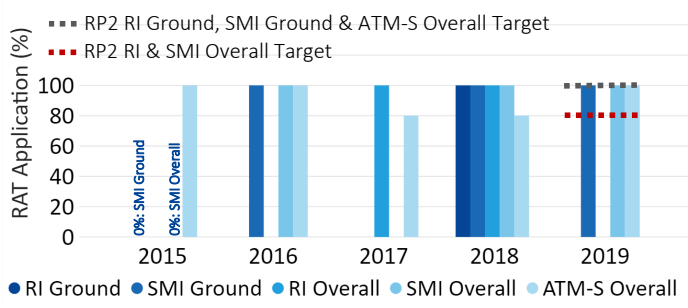


Occurrences by Type and Year



All types of occurrences decreased between 2018 and 2019 and remained below the Union-wide averages.

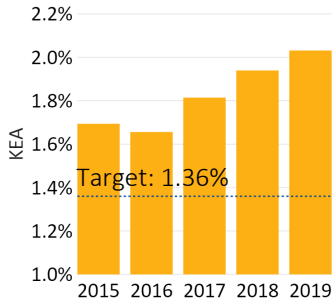
Risk Analysis Tool (RAT) Application to Severity Classification



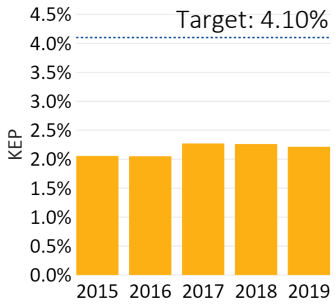
In 2019, Lithuania and Oro Navigacija achieved the targets for the application of the RAT to severity classification.

Environment

RP2 KEA Performance

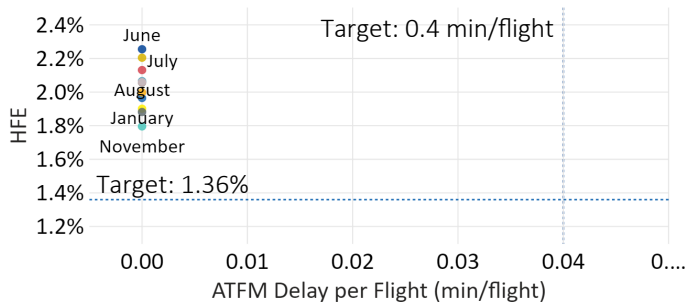


RP2 KEP Performance



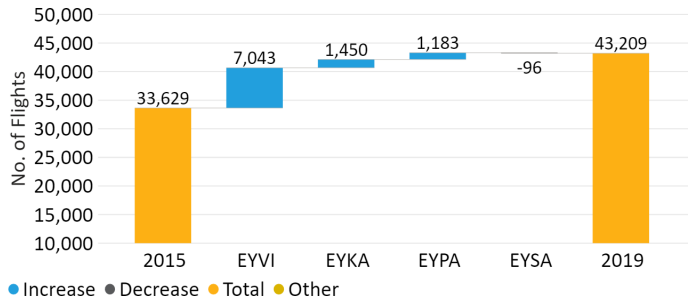
Lithuania achieved its worst KEA during RP2 in 2019. The KEP targets were achieved in 2015 and in every year thereafter.

ATFM Delay per Flight and HFE by Month in 2019



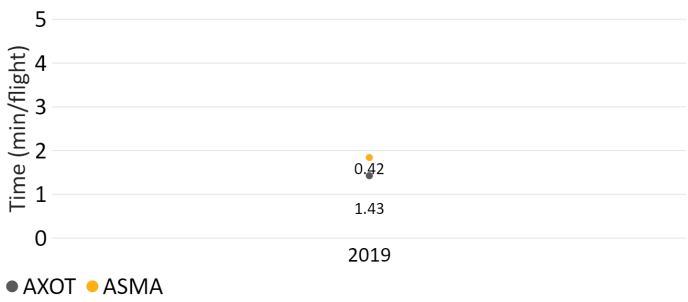
Lithuania incurred virtually zero delays in 2019 meaning it minimised it capacity impact on environmental performance.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations fell at regulated airports during RP2 by 9,580 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



In 2019, 1.85 minutes of AXOT and ASMA was endured by airspace users in Lithuania (1/4 regulated airports reported data).

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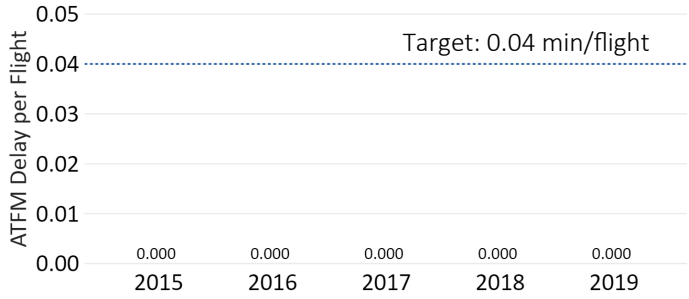
Lithuania Factsheet

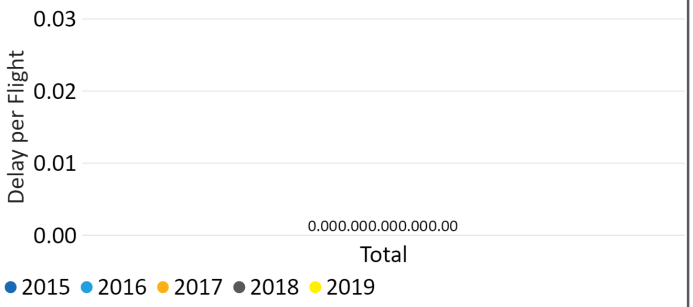
Capacity

ATFM Delay per Flight (min/flight)



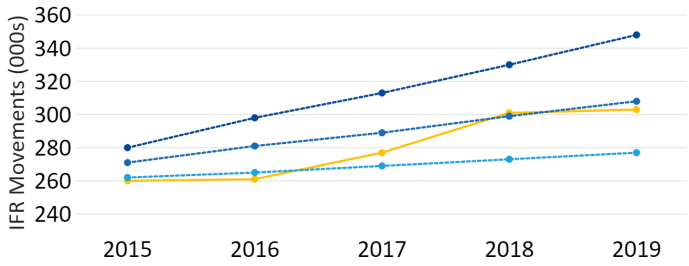
Lithuania continued to achieve zero delays in 2019.*

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



Lithuania continued to achieve zero delays in 2019.

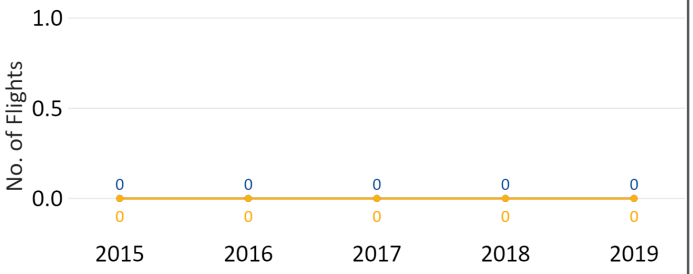
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were 9% above the STATFOR February 2014 low forecast.

Distribution of Delays (Oro Navigacija)

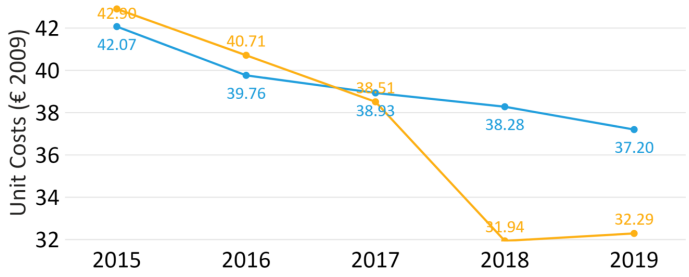


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

Lithuania did not delay any flights in 2019.

Cost-efficiency

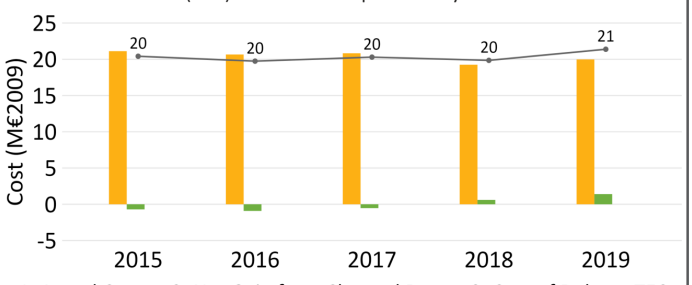
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower than planned since 2017. In 2019, actual unit costs were 13% lower than planned.

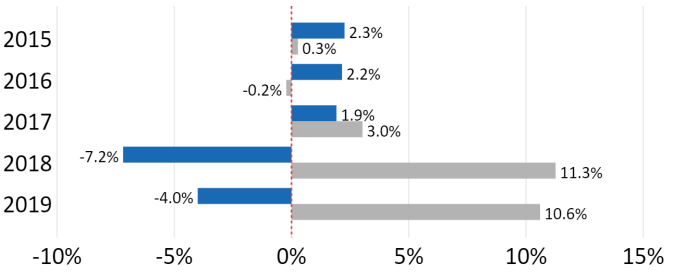
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Lithuania increased during 2019 (+5%).

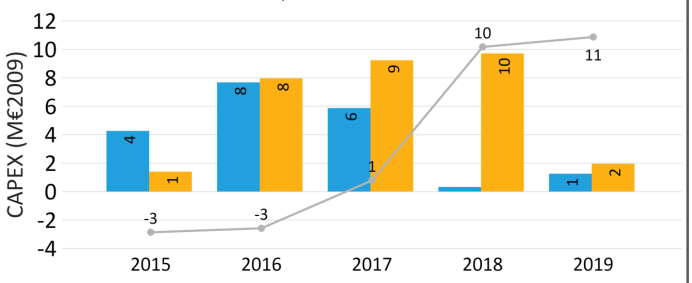
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Lower actual unit costs since 2017 were fuelled by higher than planned service units and lower spending in 2018 and 2019.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Lithuania spent 11M€ more than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Malta did not achieve the RP2 targets for the Effectiveness of Safety Management (EoSM) in 2019.
- MATS achieved the target level for all Management Objectives since 2015.
- Malta and MATS have achieved the RP2 targets for the application of the Risk Classification Scheme since 2015.
- The Airspace Infringements (AIs), Air Traffic Management Specific (ATM-S) and Separation Minima Infringements (SMIs) occurrences show the normal fluctuations and were continuously below the Union-wide average over RP2. The rate of Runway Incursions (RIs) has decreased every year over RP2 and fell below the Union-wide average in 2019.

Environment:

- Malta contributed positively towards BLUE MED FAB's actual horizontal flight efficiency environment targets (KEA) in each year of RP2 and it achieved the planned horizontal flight efficiency (KEP) targets.
- However, KEA performance worsened in 2019 and Malta's program to offer FRA below the lowest available limit could help the situation in RP3.
- Terminal vertical flight efficiency improved in RP2 as more flights completed fully continuous climb/descent at Malta International Airport in 2019 compared to 2015.
- On average, airspace users spent 2.55 additional minutes per flight taxiing out or in terminal airspace in 2019. Malta supplied all the ground terminal environmental performance data since 2017.

Capacity:

- Malta contributed positively towards BLUE MED FAB's en route Air Traffic Flow Management (ATFM) delay per flight target in 2019 with effectively zero average ATFM delay per flight, remaining below both the FAB (0.24 minutes per flight) and national (0.02 minutes per flight) targets.
- The number of instrument flight rules (IFR) movements in 2019 was 4.2% higher than in 2018, however the evolution of IFR movements remained below the STATFOR low growth forecast throughout RP2.
- ATC equipment was the only delay cause in 2019, accounting for 100% of the delay accrued (180 minutes).

Cost-efficiency:

- Malta did not achieve the en route cost-efficiency target in 2019 with the determined unit cost (19.17€$_{2009}$) being lower than the actual unit cost (19.74€$_{2009}$). It is the second year in a row that Malta does not achieve the en route cost-efficiency targets.
- In 2019, en route actual costs were above the determined costs by +6.1%. The difference was mainly due to staff costs (new hires) and costs of capital (asset base financed fully through equity).
- In 2019, Malta overinvested +1M€$_{2009}$ in CAPEX (still lagging -14M€$_{2009}$ over RP2). Malta did not materialise 60% of the planned investments during RP2, mostly related to the new control tower.
- As a result of the underinvestment in 2019, Malta charged +1.6M€$_{2009}$ (+4M€$_{2009}$ over RP2) in costs of capital and depreciation for investments not materialised. Malta should take into accounts these amounts when developing the RP3 performance plan, especially the ones related to the new control tower.

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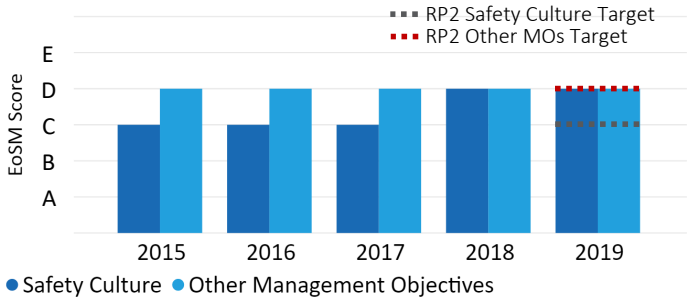
Malta Factsheet

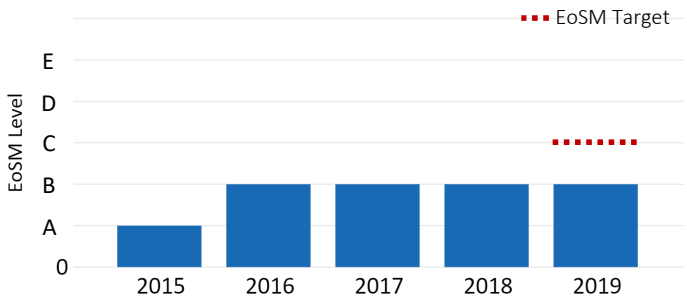
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



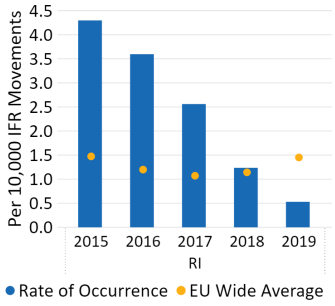
MATS has achieved the targets for the EoSM in all safety areas since 2015.

State Effectiveness of Safety Management (EoSM) by Year

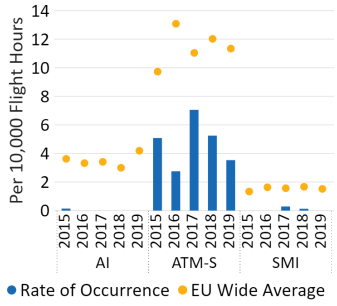


Malta has not achieved the target for the EoSM in all MOs in 2019. It improved its EoSM level in 2016.

Runway Incursions (RIs) by Year

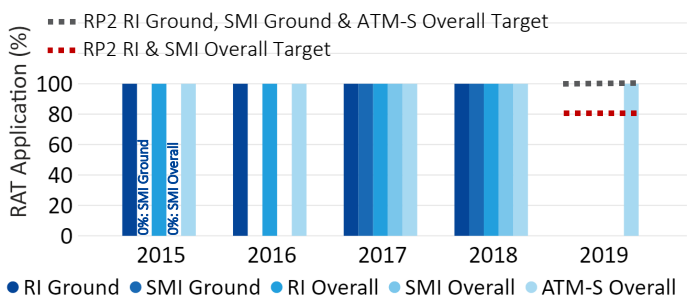


Occurrences by Type and Year



The rate of RIs continued to decrease in 2019 and was below the Union-wide average.

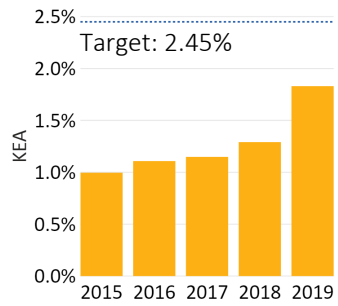
Risk Analysis Tool (RAT) Application to Severity Classification



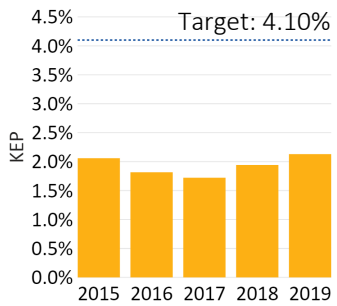
In 2019, Malta and MATS achieved the targets for the application of the RAT to severity classification.

Environment

RP2 KEA Performance

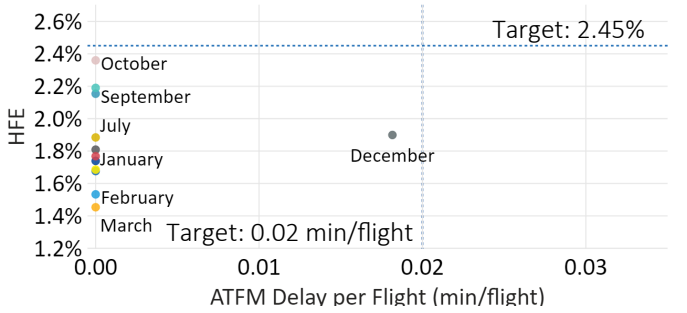


RP2 KEP Performance



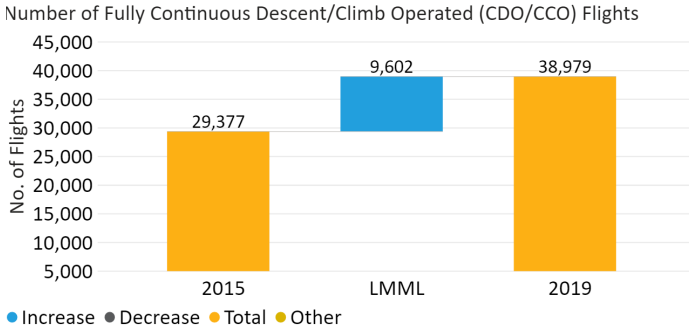
Malta achieved the KEA and KEP targets in all years of RP2. However, KEA performance deteriorated in 2019.

ATFM Delay per Flight and HFE by Month in 2019



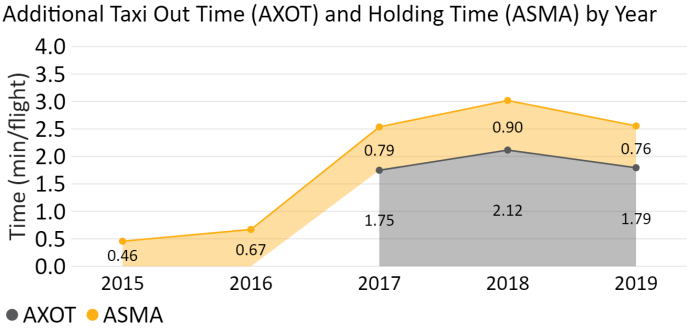
Given that Malta had many months of close to zero delays, no specific correlation exists between KEA and delays.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations increased at regulated airports during RP2 by 9,602 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



2.55 minutes of AXOT and ASMA was endured by airspace users in Malta (1/1 regulated airports reported all data since 2017).

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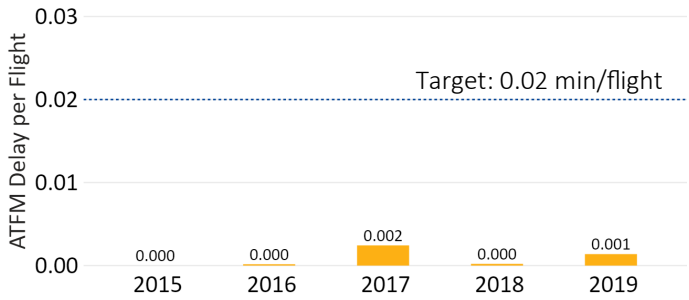
Malta Factsheet

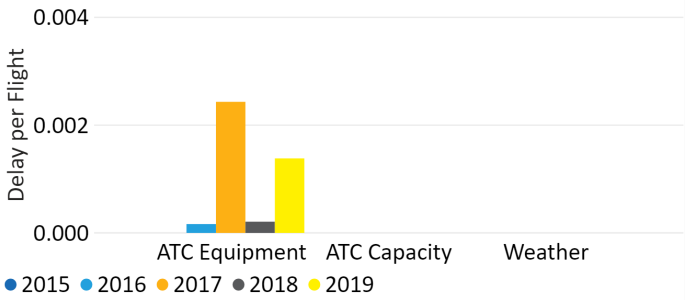
Capacity

ATFM Delay per Flight (min/flight)



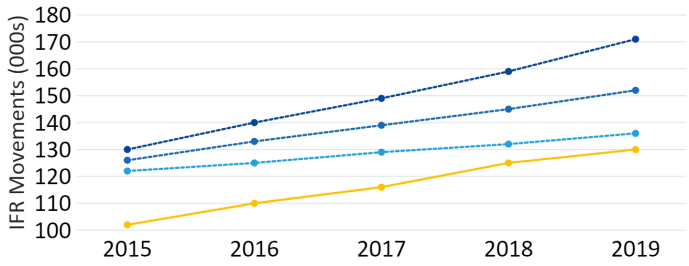
Delays in Malta continued to achieve the targets and remain very low.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



ATC Equipment was the primary cause of the minimal delays created by Malta.

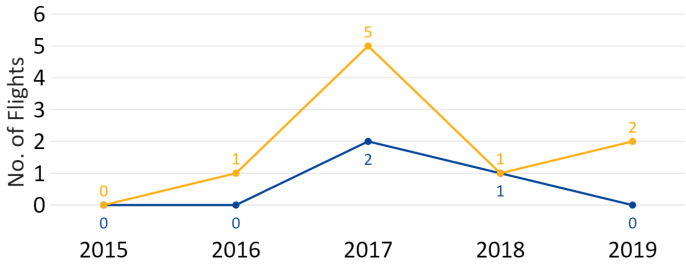
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were 4% below the STATFOR February 2014 low forecast. Traffic was below the low forecast in all years.

Distribution of Delays (MATS)

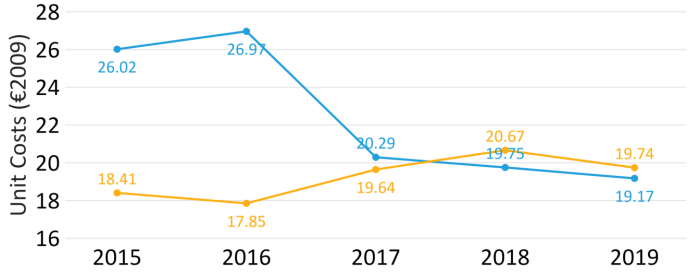


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

MATS delayed 2 flights by more than 15 minutes in 2019.

Cost-efficiency

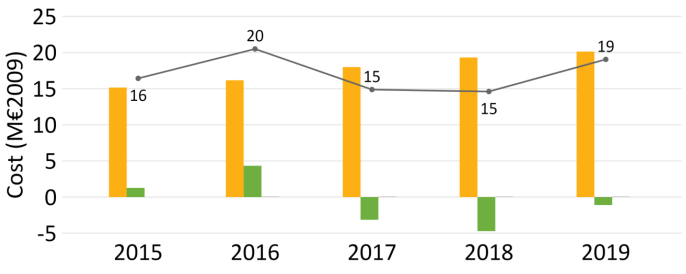
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were higher than planned since 2018. In 2019, actual unit costs were 3% higher than planned.

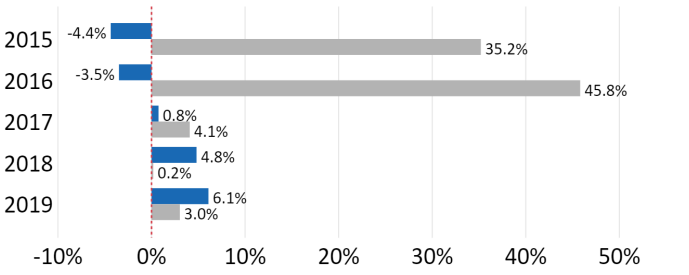
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Malta increased in 2019 (+27%).

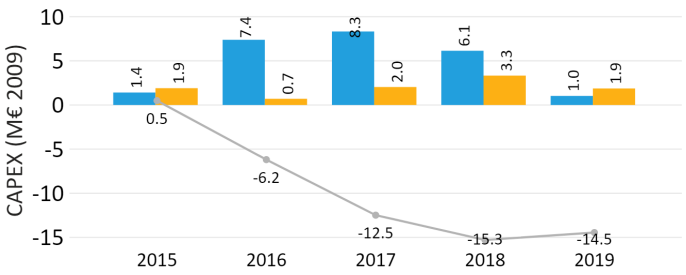
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Higher actual unit costs were fuelled by higher spending in 2018 and 2019.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Malta spent 14M€ less than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- The Netherlands did not achieve the RP2 targets for the Effectiveness of Safety Management (EoSM) in 2019 and did not improve the minimum level over RP2.
- LVNL achieved the target level for all Management Objectives in 2019.
- The Netherlands and LVNL have achieved the RP2 targets for the application of the Risk Classification Scheme in 2019.
- The rate of Runway Incursions (RIs) improved over RP2 arriving to the Union-wide comparable rate in 2019. Traffic Management Specific (ATM-S) occurrences, after a peak in 2016 fell back to below the Union-wide average from 2017 onwards.

Environment:

- The Netherlands did not contribute positively towards FABEC's actual horizontal flight efficiency environment targets (KEA) in any year of RP2 but came close in 2018. The planned horizontal flight efficiency (KEP) targets were not achieved either.
- FABEC claimed that increased traffic negatively influenced environmental performance; however, the Netherlands managed similar instrument flight rules (IFR) movements as in 2018 yet its performance worsened.
- Terminal vertical flight efficiency improved as more flights completed fully continuous climb/descent at regulated Dutch airports in 2019 compared to 2015.
- On average, airspace users spent 4.89 additional minutes per flight taxiing out or in terminal airspace in 2019, which has remained stable during RP2. Only one out of four regulated Dutch airports provided data so the full situation is not clear.

Capacity:

- The Netherlands contributed positively towards the FABEC en route Air Traffic Flow Management (ATFM) delay per flight target.
- Traffic growth was slightly below the STATFOR high scenario in 2019 for the first time since 2016. IFR movements increased by 0.22% compared to 2018. Nevertheless, total delays decreased by 50% over the same period.
- Average en route ATFM delay per flight was 0.10 minutes per flight in 2019. ATC capacity, weather and ATC staffing were the main causes behind the delays, however, ATC staffing issues seem to have been resolved, as this code was the leading cause in 2018, while it was third in 2019.
- The proportion of flights that were delayed by more than 15 minutes remained at similar levels as in 2018, at 39.39%.

Cost-efficiency:

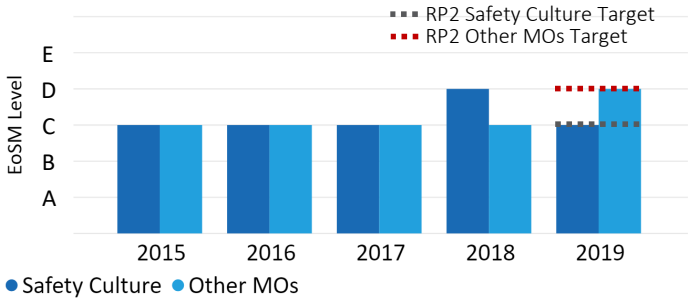
- The Netherlands did not achieve the en route cost-efficiency target in 2019, with the actual unit cost (60.43€$_{2009}$) being higher than the determined unit cost (55.00€$_{2009}$). The Netherlands achieved the en route cost-efficiency targets in each year of RP2, except for 2019.
- In 2019, en route actual costs were above the determined costs by +21%. As reported in the additional information, the variation is due to additional internal and external staff, increased pension premiums and additions to staff provisions.
- In 2019, the Netherlands overinvested +49M€$_{2009}$ in CAPEX (+29M€$_{2009}$ over RP2). The Netherlands was able to close the investment gap created in the first years of the period. However, +22.04M€$_{2009}$ more than initially planned over the period have been invested in "expansion facilities", while the "replacement of AAA" remained underinvested by -28.2M€$_{2009}$.
- Due to the late catching up of CAPEX, the Netherlands charged +9.3M€$_{2009}$ over RP2 in costs of capital and depreciation for investments not materialised. Considering the great overspending in 2019 to manage the projects portfolio, it is imperative for the Netherlands to take into accounts these amounts when developing the RP3 performance plan.

PRB Performance review body of the single european sky

Netherlands Factsheet

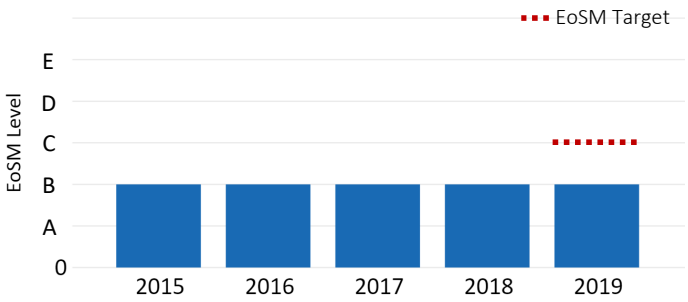
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



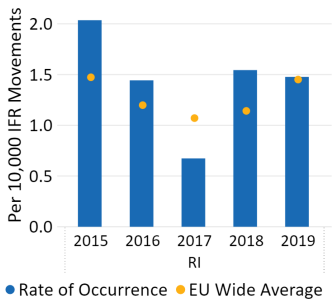
LVNL has achieved the targets for the EoSM for all Management Objectives in 2019.

State Effectiveness of Safety Management (EoSM) by Year

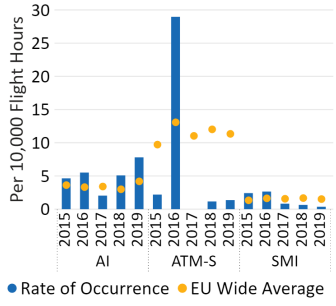


The Netherlands did not achieve the target for the EoSM in 2019 and did not improve its minimum level over RP2.

Runway Incursions (RIs) by Year

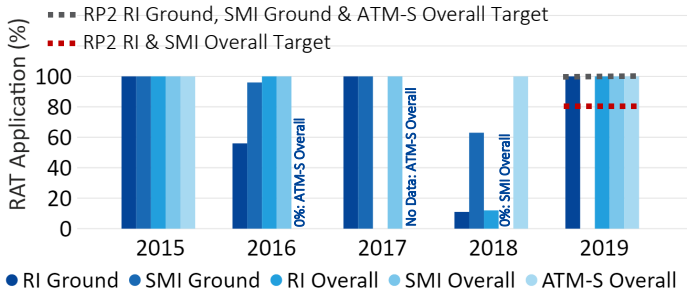


Occurrences by Type and Year



Between 2018 and 2019, RIs and SMIs slightly decreased. AI and ATM-S increased.

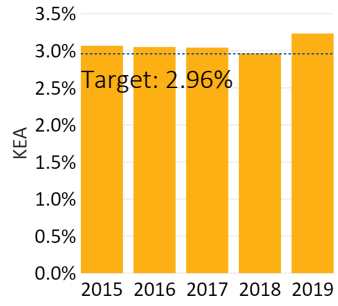
Risk Analysis Tool (RAT) Application to Severity Classification



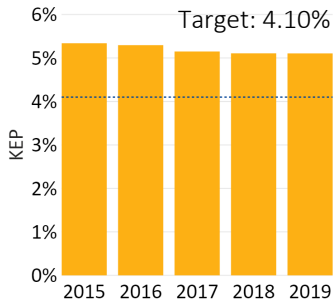
In 2019, Netherlands and LVNL achieved the targets for the application of the RAT to severity classification.

Environment

RP2 KEA Performance

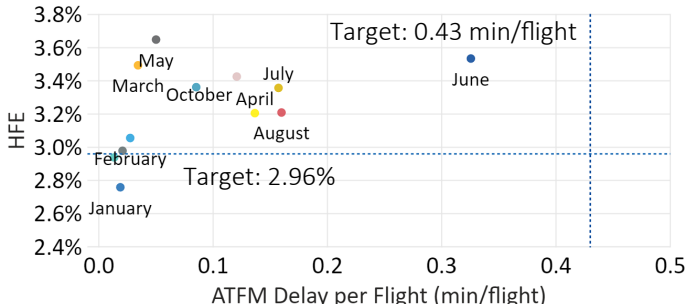


RP2 KEP Performance



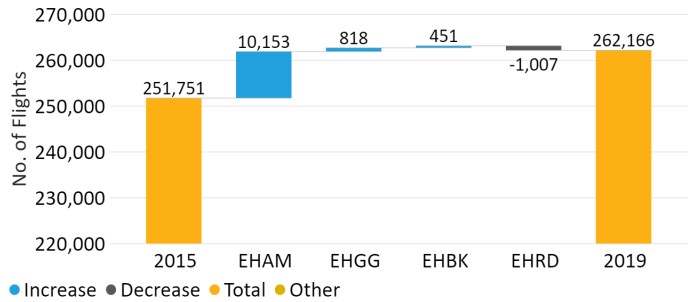
Netherlands did not achieve the KEA or KEP targets in 2019. However, KEP performance improved in each year.

ATFM Delay per Flight and HFE by Month in 2019



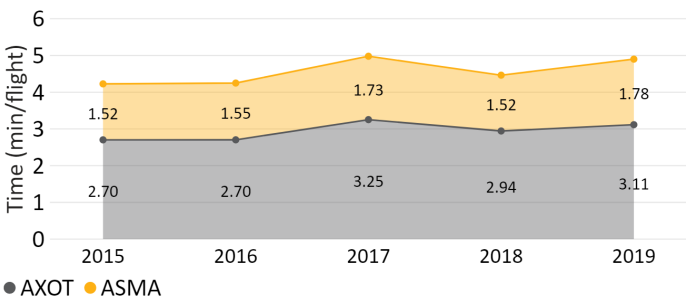
No specific correlation was evident from the 2019 delays and KEA data.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



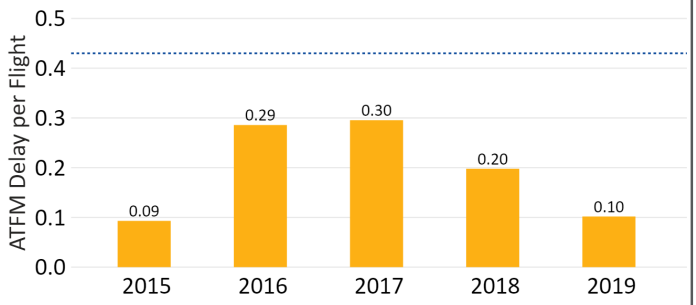
The number of flights performing fully CCO & CDO operations increased at regulated airports during RP2 by 10,415 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



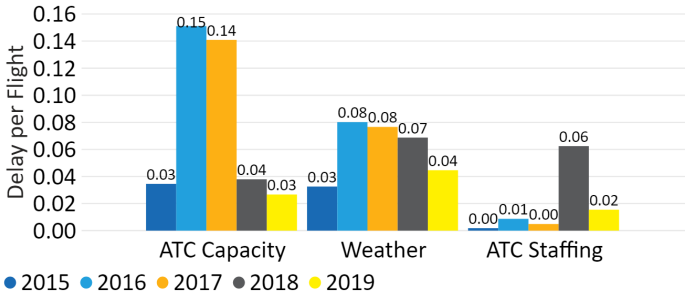
4.89 minutes of AXOT and ASMA was endured by airspace users in the Netherlands (1/4 regulated airports reported data).

ATFM Delay per Flight (min/flight)



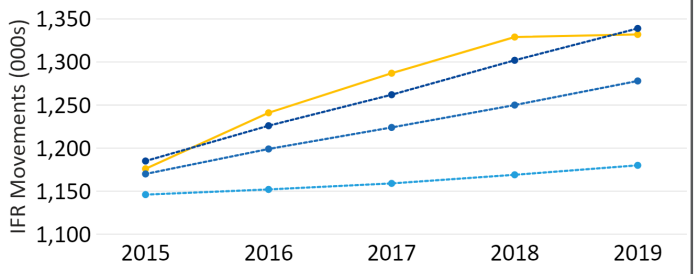
Delays in the Netherlands decreased year-on-year by 50% in 2019 and continued to contribute positively to the FAB targets.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



ATC capacity, weather and staffing were the leading delay reasons contributing 30%, 40% and 20% of 2019 delays respectively.

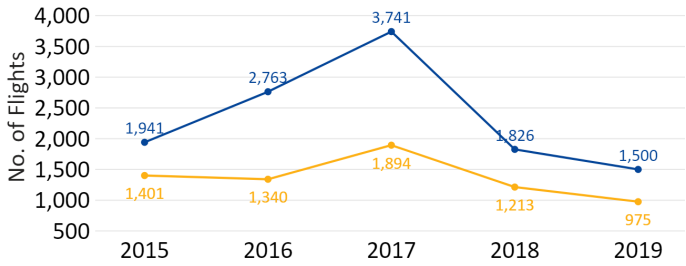
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were 4% above the STATFOR February 2014 base forecast and fell below the high forecast.

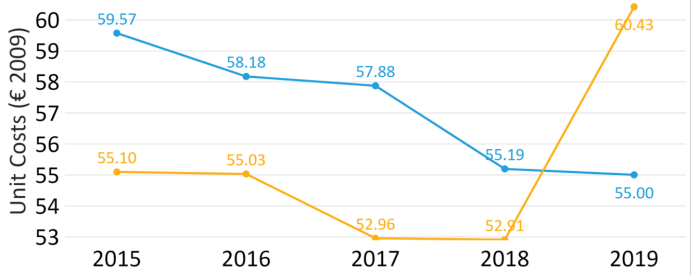
Distribution of Delays (LVNL)



No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

LVNL delayed 975 flights by more than 15 minutes in 2019, which was 39% of all delayed flights.

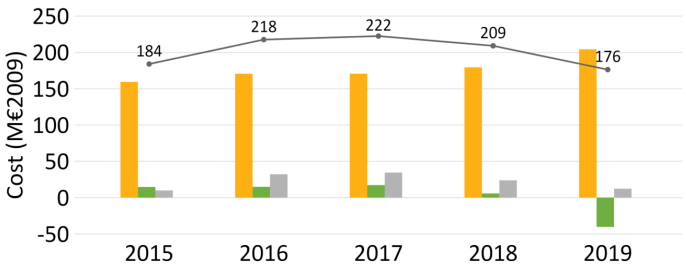
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were higher than planned for the first time in RP2 in 2019 (+10%).

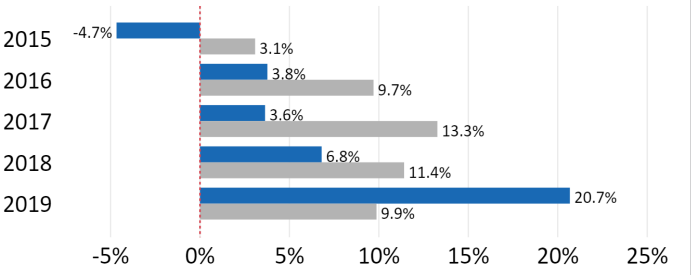
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in the Netherlands decreased in 2019 (-16%).

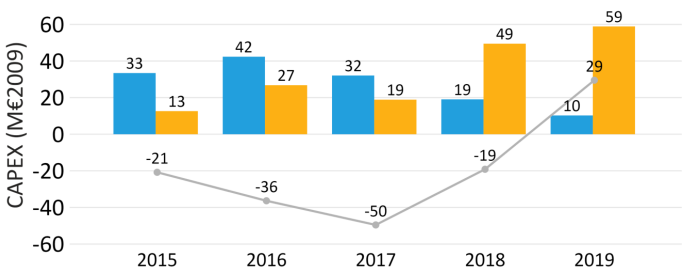
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Higher actual unit cost in 2019 were fuelled by higher spending.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

The Netherlands spent 29M€ more than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Norway achieved the target level for all Management Objectives (MOs) in 2019.
- Avinor achieved the target levels for all MOs since 2018.
- Norway and Avinor have achieved the RP2 targets for the application of the Risk Classification Scheme in 2019.
- The rate of all type of occurrences remained above the Union-wide average in 2019, except for Separation Minima Infringements (SMIs), which fell below the average since 2017. The rate of Runway Incursions (RIs) and Airspace Infringements (AIs) increased, while the rate of SMIs and Air Traffic Management Specific (ATM-S) improved relative to 2015.

Environment:

- Norway did not contribute positively towards NEFAB's actual horizontal flight efficiency environment targets (KEA) although the planned horizontal flight efficiency (KEP) targets were achieved.
- KEA performance was volatile during RP2 despite the offering of free route airspace. Both the NSA and ANSP consider there are limited measures that could be taken to improve the situation and that external factors now influence KEA year to year.
- Terminal vertical flight efficiency did not improve as less flights completed fully continuous climb/descent at Norway's regulated airports in 2019 compared to 2015.
- Terminal performance worsened with airspace users spending 4.97 additional minutes per flight taxiing out or in terminal airspace in 2019, which is worse than in 2017 when Norway began suppling both taxi-out and holding time data for one out four regulated airports.

Capacity:

- Norway contributed positively towards NEFAB's en route Air Traffic Flow Management (ATFM) delay per flight targets in 2019 with almost zero minutes of ATFM delay per flight recorded for three consecutive years.
- The number of instrument flight rules (IFR) movements in 2019 continued to be below the STATFOR February 2014 low growth forecast for the entire reference period. The 7% decrease in IFR movements compared to 2018 together with realised capacity enhancement measures improved the en route ATFM delay per flight by 40%.
- No discernible delay causes were identified for 2019 with delays recorded at thousandths of a minute across all delay categories.

Cost-efficiency:

- Norway did not achieve the en route cost-efficiency target in 2019 with the actual unit cost (44.58€$_{2009}$) being higher than the determined unit cost (40.34€$_{2009}$). Norway achieved the en route cost-efficiency targets in each year of RP2, except for 2019.
- In 2019, en route actual costs were above the determined costs by +5.6% despite the traffic was below the determined by -4.4%. The difference was mainly due to pension costs.
- In 2019, Norway overinvested +11M€$_{2009}$ in CAPEX (but still lagging -12M€$_{2009}$ over RP2). Norway was not able to close the CAPEX gap over RP2 with the new ATM infrastructure being the most underinvested project.
- As a result of the underinvestment, Norway charged +24.3M€$_{2009}$ over RP2 in costs of capital and depreciation for investments not materialised. It is imperative for Norway to take into account these amounts when developing the RP3 performance plan.

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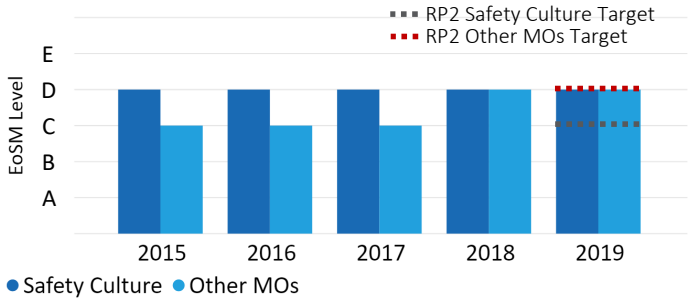
Norway Factsheet

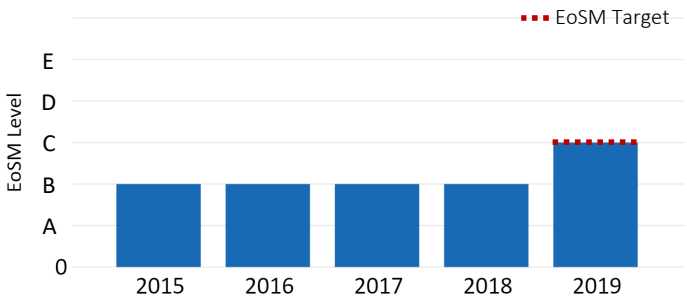
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



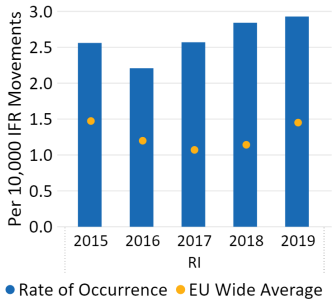
Avinor has achieved the targets for the EoSM for all Management Objectives since 2018.

State Effectiveness of Safety Management (EoSM) by Year

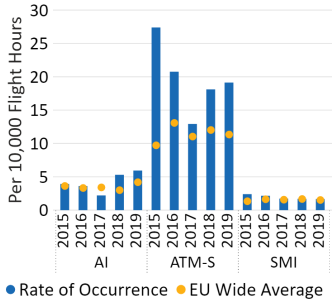


Norway achieved the target for the EoSM on all Management Objectives in 2019.

Runway Incursions (RIs) by Year

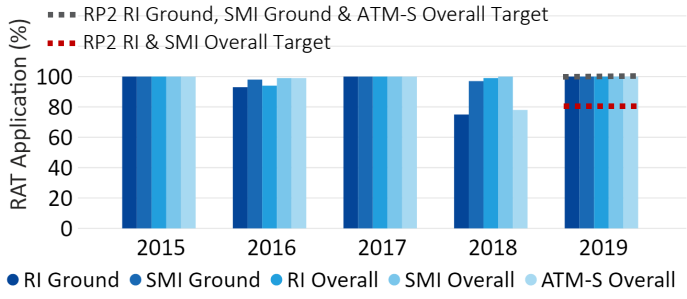


Occurrences by Type and Year



Rates of SMIs and ATM-S improved in 2019 relative to 2015. Rates for all types, except SMIs, were over the EU-wide average in 2019.

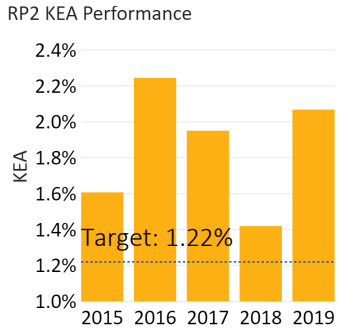
Risk Analysis Tool (RAT) Application to Severity Classification



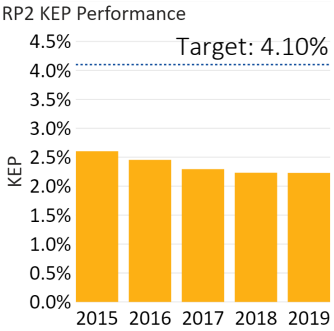
In 2019, Norway and Avinor achieved the targets for the application of the RAT to severity classification.

Environment

RP2 KEA Performance

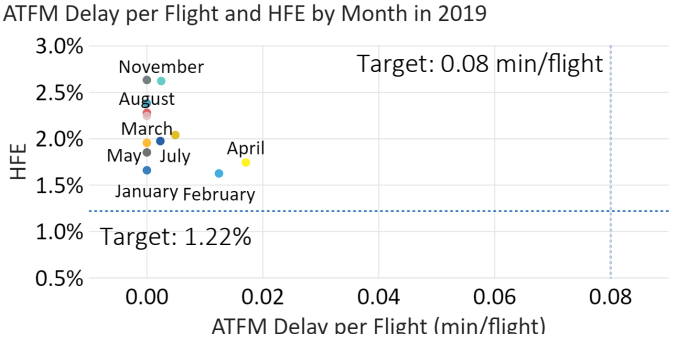


RP2 KEP Performance



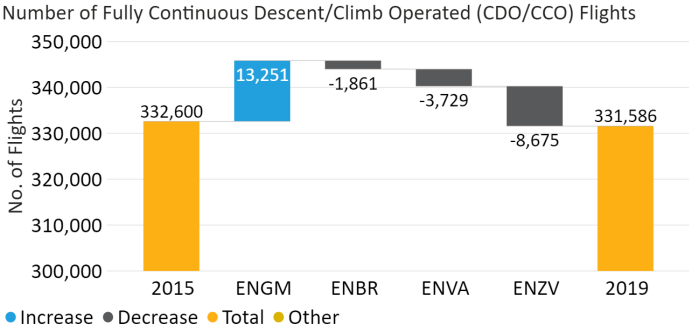
Norway did not contribute to the FAB KEA target in 2019. Norway did contribute to the KEP targets in all years of RP2.

ATFM Delay per Flight and HFE by Month in 2019



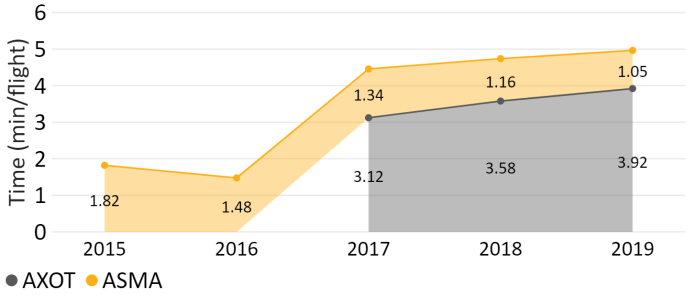
Given that Norway had many months of close to zero delays, no specific correlation exists between KEA and delays.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations fell at regulated airports during RP2 by 1,014 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



4.97 minutes of AXOT and ASMA was endured by airspace users in Norway (1/4 regulated airports reported all data since 2017).

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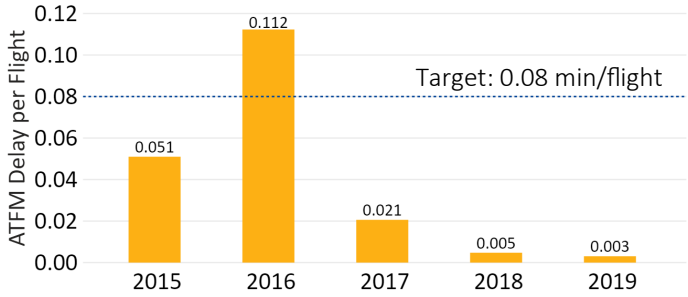
Norway Factsheet

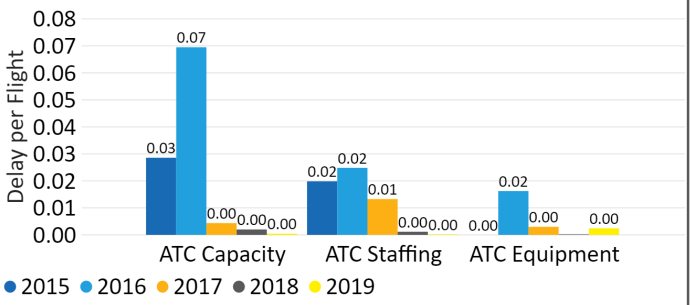
Capacity

ATFM Delay per Flight (min/flight)



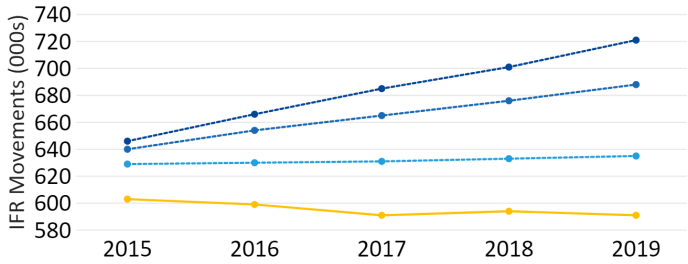
Delays in Norway decreased year-on-year by 40% in 2019 to continue achieving the targets.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



ATC capacity, ATC staffing and weather were the leading delay reasons in 2019.

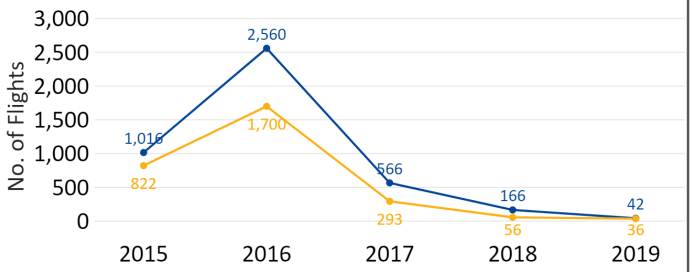
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

2019 IFR movements were 7% below the STATFOR February 2014 low forecast. Traffic was lower than the low forecast in all years.

Distribution of Delays (Avinor)

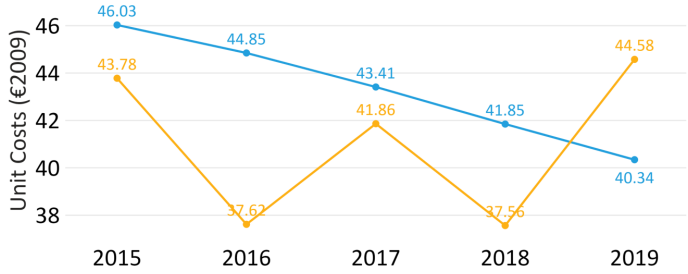


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

Avinor delayed 36 flights by more than 15 minutes in 2019, which was 46% of all delayed flights.

Cost-efficiency

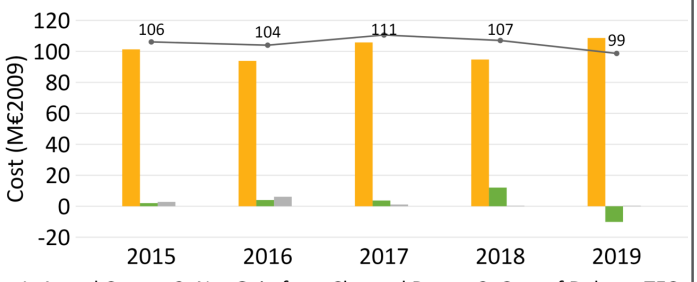
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were higher than planned for the first time in RP2 in 2019. Actual unit costs were 11% higher than planned.

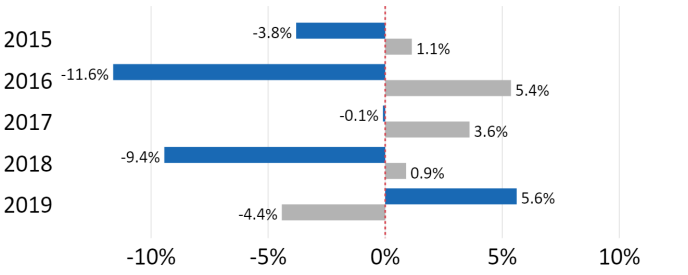
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Norway decreased during 2019 (-7%).

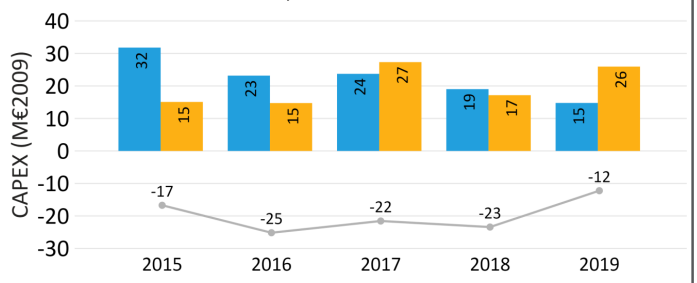
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Higher than planned actual unit costs in 2019 were caused by higher than planned costs and lower than planned service units.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Norway spent 12M€ less than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Poland achieved the target level in all Management Objectives in 2019.
- PANSA achieved the target level for safety culture since 2017 and for other MOs in 2019.
- PANSA achieved the RP2 targets for the application of the Risk Classification Scheme in 2019. Poland did not achieve the targets.
- The rate of Runway Incursions (RIs) improved in 2019 relative to 2015 and remain below the Union-wide average. The rate of Separation Minima Infringement (SMIs), Airspace Infringements (AIs) and Air Traffic Management Specific (ATM -S) increased in 2019 relative to 2015. SMIs and ATM-S remain below the Union-wide average while AIs were slightly above the Union-wide average in 2018 and 2019.

Environment:

- Poland did not contribute positively towards BALTIC FAB's actual horizontal flight efficiency environment targets (KEA) in any year of RP2. However, the planned horizontal flight efficiency (KEP) targets were achieved.
- The NSA monitoring report states the same reasons as 2018 for missing the KEA targets i.e. traffic bypassing Ukrainian airspace, increased military activities, enhanced Network Measures (eNM), difference in unit rates between Poland and Germany and adverse weather.
- However, eNM measures were applied during the summer whereas the data shows that Poland was unable to achieve the KEA targets in each month of 2019. Poland claimed that its Flexible Use of Airspace (FUA) activities are optimised and no further room for improvement remains, but it then goes on to explain that reviewing the structuring of its air-space could help.
- Terminal vertical flight efficiency improved as more flights completed fully continuous climb/descent operations at Poland's regulated airports in 2019 compared to 2015.
- Only one out of 15 regulated airports supplied ground terminal environmental data since 2016. Terminal performance worsened with airspace users spending 5.52 additional minutes per flight taxiing out or in terminal airspace.

Capacity:

- In 2019, Poland contributed positively towards the BALTIC FAB's en route Air Traffic Flow Management (ATFM) delay per flight target achieving 0.12 minutes of average ATFM delay per flight compared to the national target established of 0.23 minutes of delay per flight.
- The number of instrument flight rules (IFR) movements in 2019 stayed above the STATFOR February 2014 base growth forecast. Despite the 5% increase in IFR movements compared to 2018, the achieved capacity enhancement measures contributed to a 52% reduction in ATFM delay per flight. A big factor that contributed is also the post-ops adjustment process without which the total en route ATFM delay accountable to Network Manager measures would be 64% high-er.
- The main delay causes include ATC Capacity, which contributing 50% of the total en route ATFM delay, and ATC Staffing, which contributed 42% of the total en route ATFM delay.

Cost-efficiency:

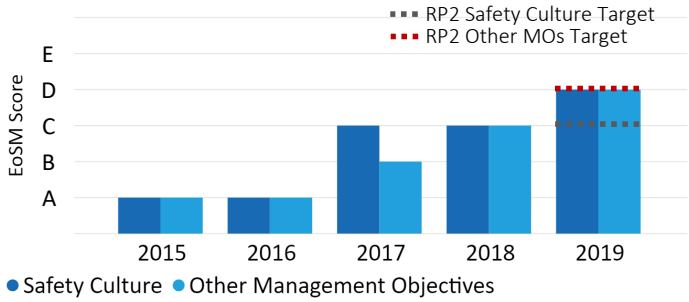
- Poland achieved the en route cost-efficiency target in 2019 with the actual unit cost (33.50€$_{2009}$) being lower than the determined unit cost (34.75€$_{2009}$). Poland did not achieve the en route cost-efficiency targets in 2015 and 2016, which was before the revision of the performance plan.
- In 2019, en route actual costs were above the determined costs by +5.1%. Poland shows higher costs than the deter-mined for all the cost categories, with the only exception of the cost of capital.
- In 2019, Poland underspent -6M€$_{2009}$ in CAPEX (-24M€$_{2009}$ over RP2). Despite this, most of the projects are ongoing and no major delays have been reported.

PRB Performance review body of the single european sky

Poland Factsheet

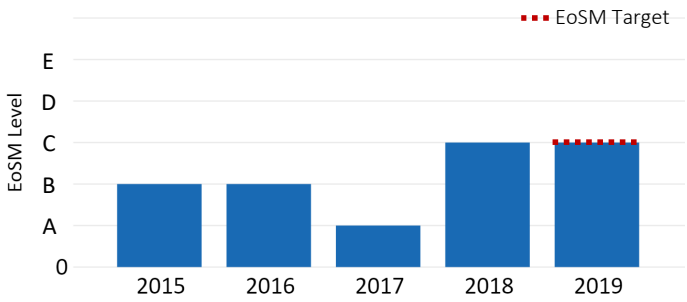
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



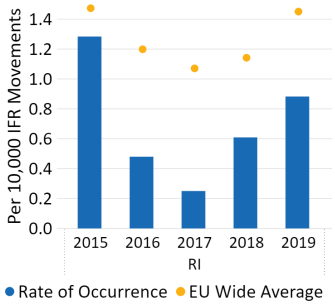
PANSA achieved the target level for safety culture in 2017 and for other Management Objectives in 2019.

State Effectiveness of Safety Management (EoSM) by Year

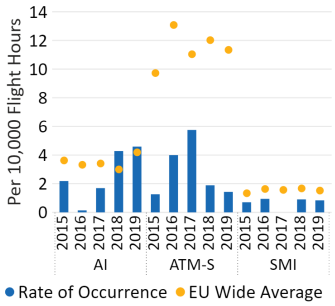


Poland achieved the targets for the EoSM for all safety objectives in 2019.

Runway Incursions (RIs) by Year

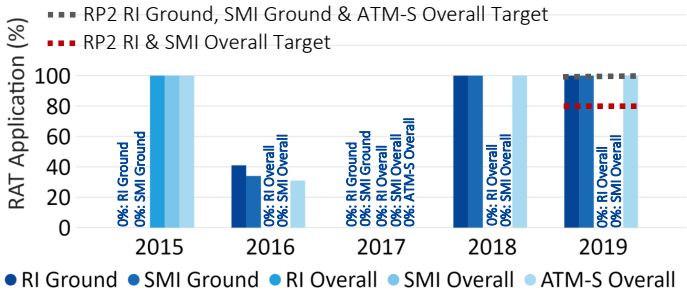


Occurrences by Type and Year



Rates of SMIs, AIs and ATM-s increased in 2019 relative to 2015, but remain below or close to the Union-wide average in 2019.

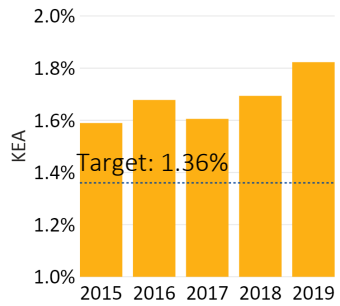
Risk Analysis Tool (RAT) Application to Severity Classification



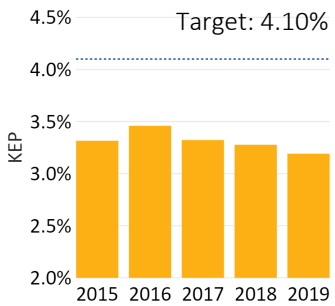
PANSA achieved the RP2 targets for the application of the Risk Classification Scheme in 2019. Poland did not.

Environment

RP2 KEA Performance

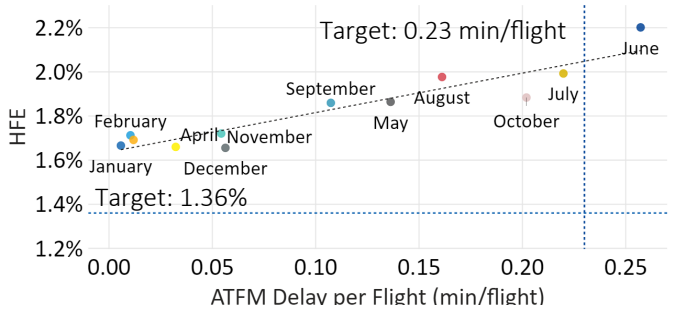


RP2 KEP Performance



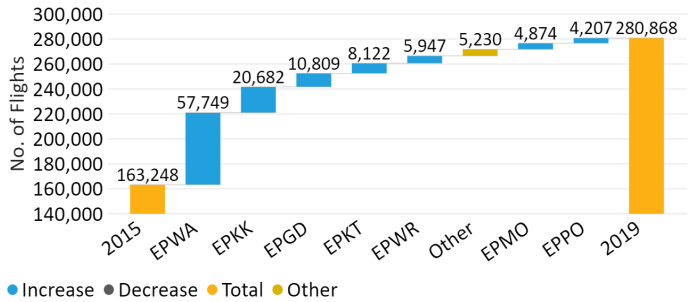
Poland did not contribute to the FAB KEA target in 2019. Poland did contribute to the FAB KEP targets in all years of RP2.

ATFM Delay per Flight and HFE by Month in 2019



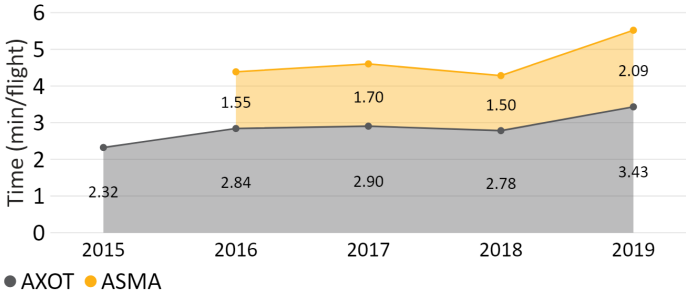
Each minute of additional en route ATFM delay per flight in 2019 correlated with a circa 1% increase in HFE.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations increased at regulated airports during RP2 by 117,620 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



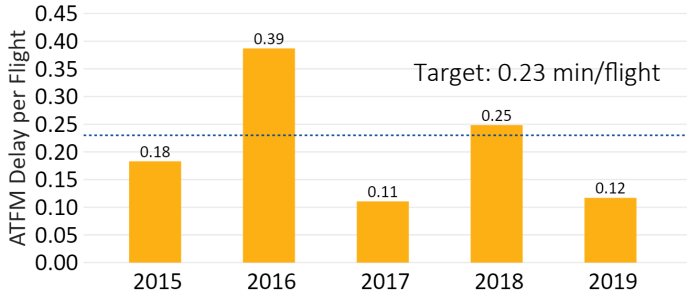
5.52 minutes of AXOT and ASMA was endured by airspace users in Poland (1/15 regulated airports reported all data in 2019).

PRB Performance review body of the single european sky

Poland Factsheet

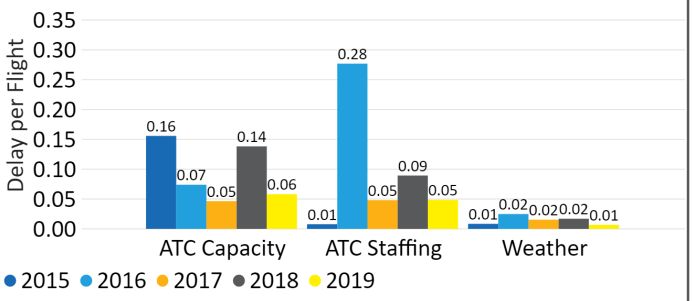
Capacity

ATFM Delay per Flight (min/flight)



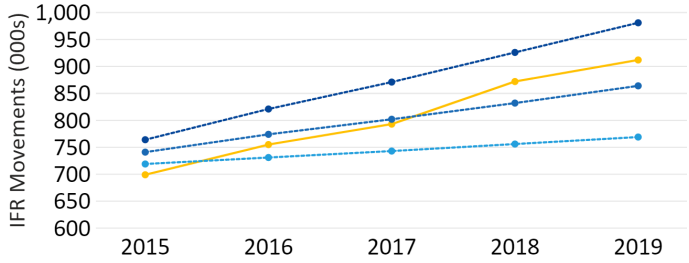
Delays in Poland decreased year-on-year by 52% in 2019. Poland achieved the targets in 2019.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



ATC capacity, staffing and weather were the leading delay reasons contributing 50%, 42% and 8% of 2019 delays respectively.

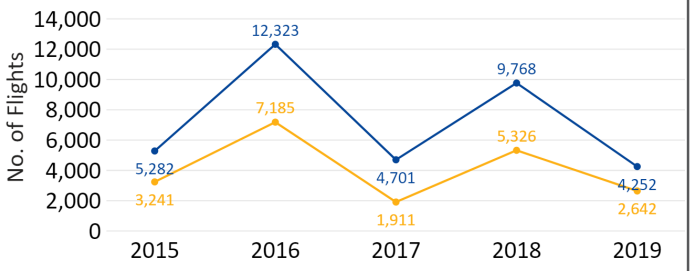
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were 6% above the STATFOR February 2014 base forecast.

Distribution of Delays (PANSA)

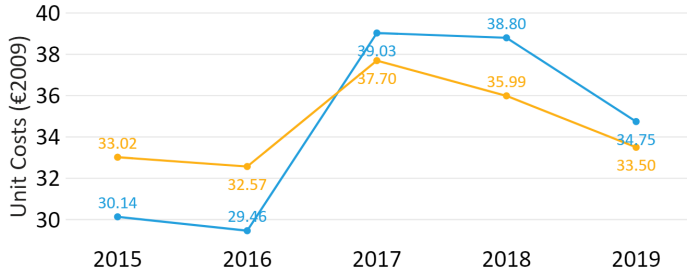


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

PANSA delayed 2,642 flights by more than 15 minutes in 2019, which was 38% of all delayed flights.

Cost-efficiency

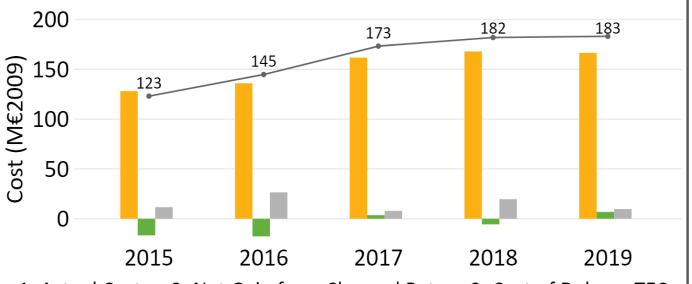
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower than planned since 2017. In 2019, actual unit costs were 4% lower than planned.

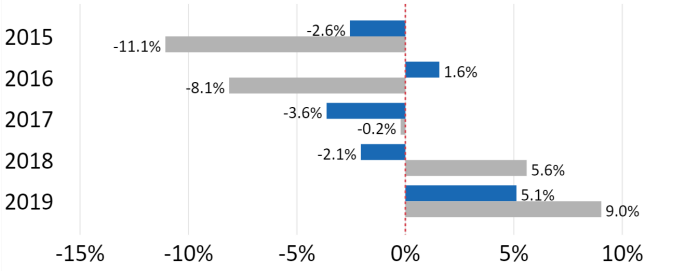
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Poland increased during 2019 (+0.5%).

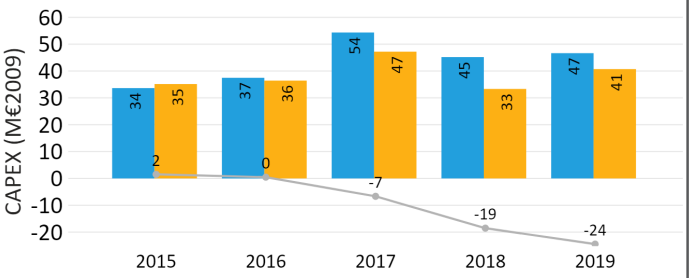
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Lower actual unit costs were fuelled by higher service units in 2018 and 2019.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Poland spent 24M€ less than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Portugal did not achieve the RP2 targets for the Effectiveness of Safety Management (EoSM) in 2019. Over RP2, Portugal improved their minimum EoSM level from "A" to "B".
- NAV Portugal achieved the target for the EoSM for all Management Objectives since 2015.
- Portugal and NAV Portugal have achieved the RP2 targets for the application of the Risk Classification Scheme in 2019.
- All occurrence rates remained below the Union-wide averages over RP2. The rate of Runway Incurions (RIs) increased relative to 2015.

Environment:

- Portugal contributed positively towards SW FAB's actual horizontal flight efficiency environment targets (KEA) and the planned horizontal flight efficiency (KEP) targets were also achieved.
- Terminal vertical flight efficiency improved as more flights completed fully continuous climb/descent at all of Portugal's regulated airports in 2019 compared to 2015.
- On average, airspace users spent 5.00 additional minutes per flight taxiing out or in terminal airspace which is an improvement relative to 2018.

Capacity:

- Portugal did not contribute positively towards SW FAB's en route Air Traffic Flow Management (ATFM) delay per flight targets by exceeding the national target in 2019 and every year during RP2.
- The number of instrument flight rules (IFR) movements in 2019 was 3% higher than in 2018 while the en route ATFM delay per flight increased by 32%. The evolution of IFR movements remained at or above the STATFOR high growth forecast throughout RP2.
- ATC capacity caused 44% of the total delays, ATC equipment caused 24% and ATC staffing caused 20%. The dynamic split of south sector was delayed until the implementation of the new ATM system.
- The replacement of Porto Santo's radar forced the control of an en route sector in degraded mode with a significant contribution to the total delay.

Cost-efficiency:

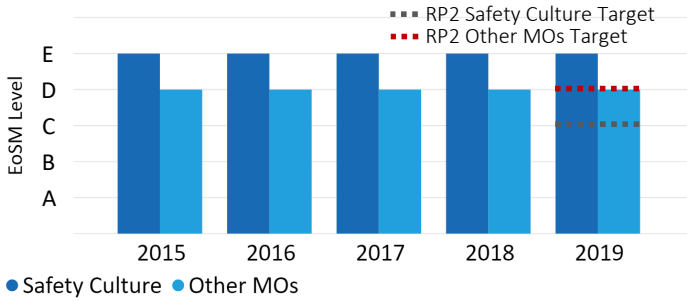
- Portugal did not achieve the en route cost-efficiency target in 2019 with the actual unit cost (31.36€$_{2009}$) being higher than the determined unit cost (29.35€$_{2009}$). It is the second year in a row that Portugal did not achieve the en route cost-efficiency targets.
- In 2019, en route actual costs were above the determined costs by +6.4%. The difference was mainly due to staff costs (overtime and pension fund). Portugal revised its performance plan in 2018 and it is unclear why it was unable to properly forecast its own costs.
- In 2019, Portugal overinvested +20M€$_{2009}$ in total CAPEX (+27M€$_{2009}$ over RP2). The new system in Lisbon Area Control Centre is the biggest source of the variation. Moreover, Portugal invested +12.6M€$_{2009}$ more than planned over the period in other CAPEX, but it is unclear the purpose of such investments.
- Portugal charged +11.9M€$_{2009}$ over RP2 in costs of capital and depreciation for investments not materialised. Portugal should take into accounts these amounts when developing the RP3 performance plan.

PRB Performance review body of the single european sky

Portugal Factsheet

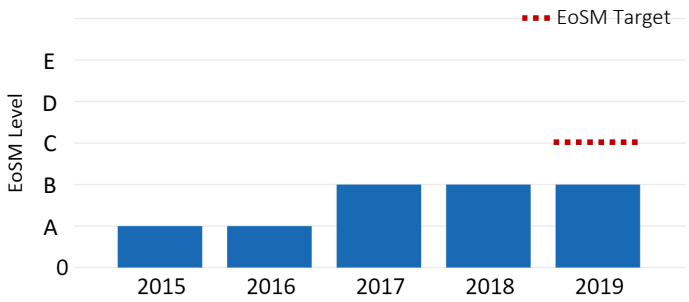
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



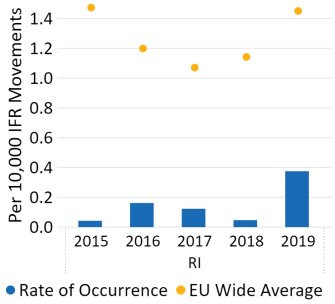
NAV Portugal has achieved the targets for the EoSM in all Management Objectives since 2015.

State Effectiveness of Safety Management (EoSM) by Year

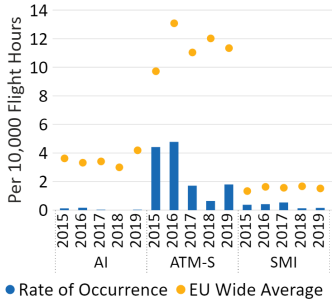


Portugal did not achieve the targets for the EoSM 2019. Its minimum EoSM level did improve in 2017 from "A" to "B".

Runway Incursions (RIs) by Year

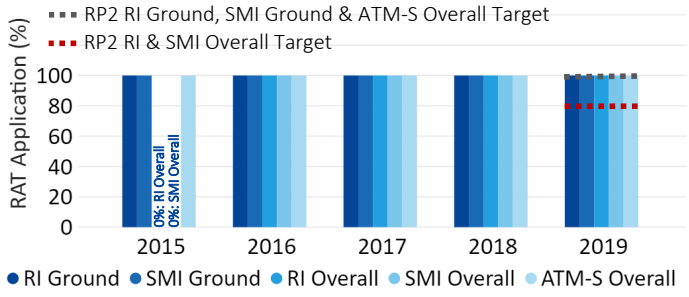


Occurrences by Type and Year



Rates of RI and ATM-S occurrences increased in 2019. All rates remained below the Union-wide averages throughout RP2.

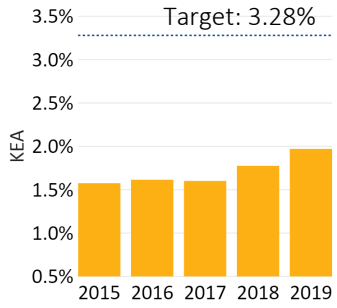
Risk Analysis Tool (RAT) Application to Severity Classification



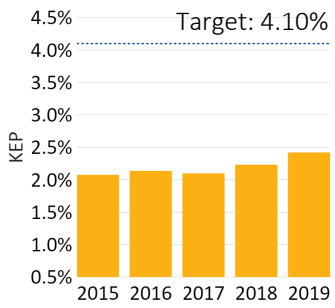
Portugal and Nav Portugal achieved the targets for the application of the RAT to severity classification since 2016.

Environment

RP2 KEA Performance

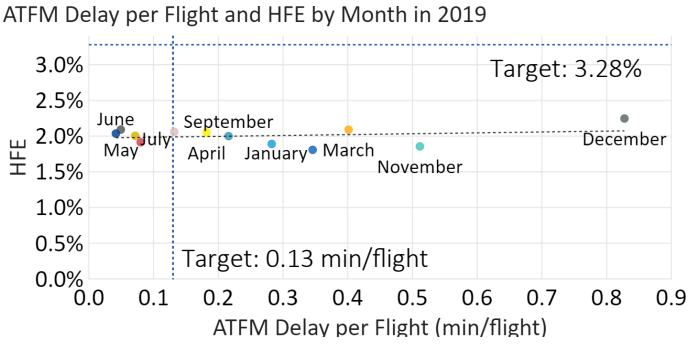


RP2 KEP Performance



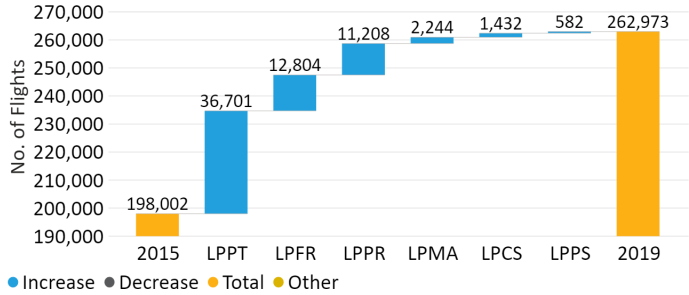
Portugal contributed positively to the FAB KEA target and Union-wide KEP target in every year of RP2.

ATFM Delay per Flight and HFE by Month in 2019



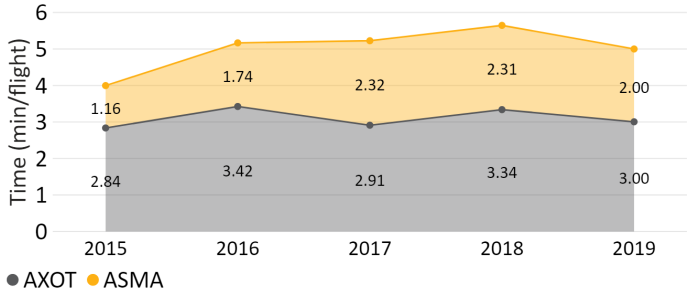
In Portugal, delays did not correlate with changes in horizontal flight efficiency.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations increased at regulated airports during RP2 by 64,971 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



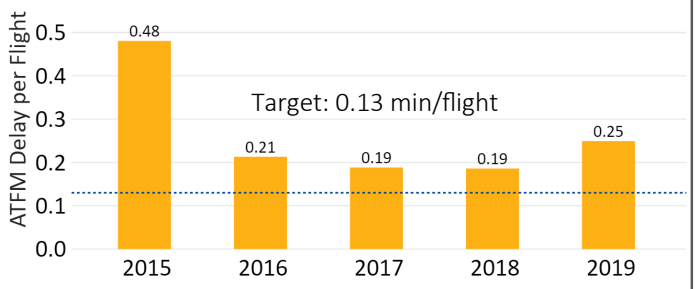
5 minutes of AXOT and ASMA was endured by airspace users in Portugal (4/10 regulated airports reported data in 2019).

PRB Performance review body of the single european sky

Portugal Factsheet

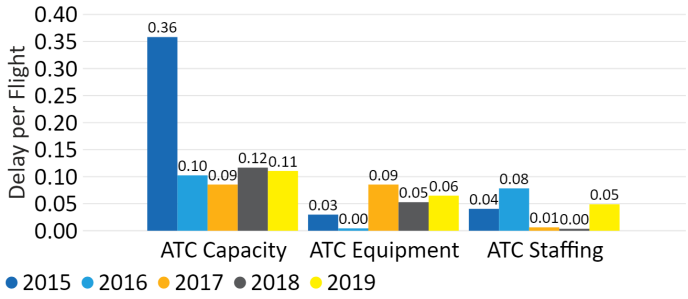
Capacity

ATFM Delay per Flight (min/flight)



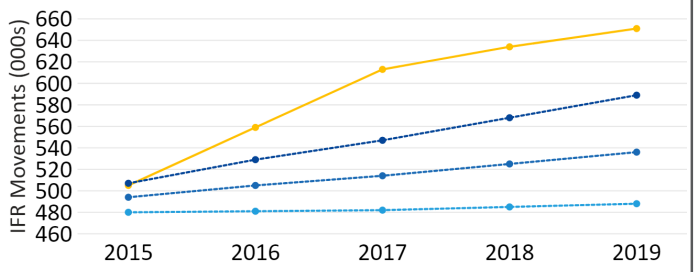
Delays in Portugal increased year-on-year by 32% in 2019. Portugal did not achieve the targets in any year of RP2.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



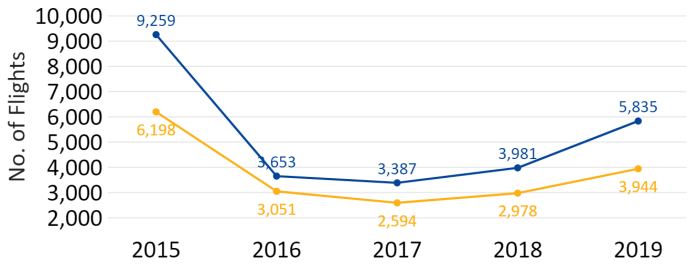
ATC capacity, equipment and staffing were the leading delay reasons contributing 44%, 24% and 20% of 2019 delays respectively.

IFR Movements by Year and Forecast Type (STATFOR February 2014)



IFR movements in 2019 were 11% above the STATFOR February 2014 high forecast.

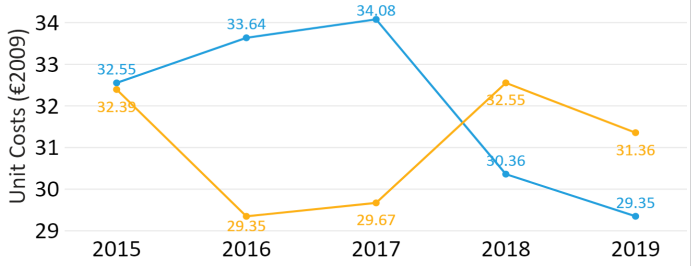
Distribution of Delays (NAV Portugal)



NAV Portugal delayed 3,944 flights by more than 15 minutes in 2019, which was 40% of all delayed flights.

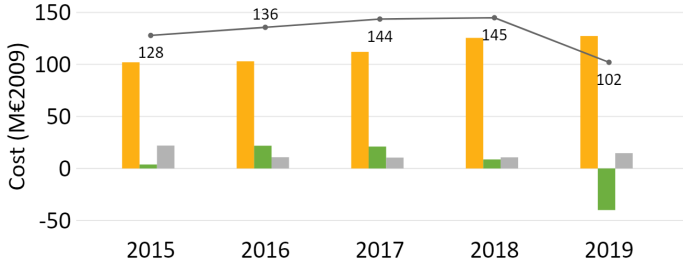
Cost-efficiency

Determined and Actual Unit Costs by Year



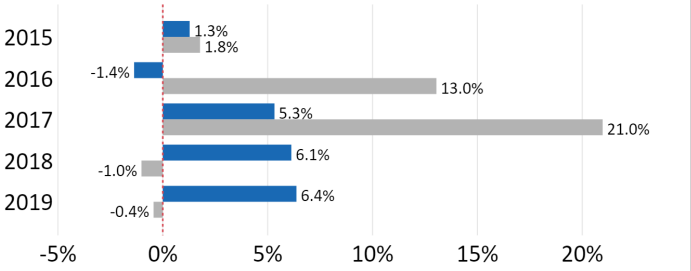
Actual unit costs were higher than planned in 2018 and 2019. In 2019, actual unit costs were 7% higher than planned.

Total Economic Cost (TEC) and Cost Components by Year



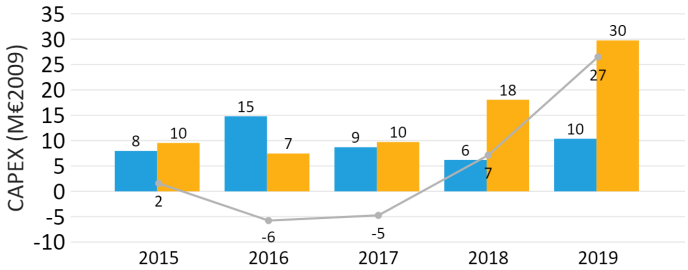
The year-on-year total economic cost for airspace users to use air navigation services in Portugal decreased during 2019 (-30%).

% Difference between Actual and Determined Costs and Service Units by Year



Higher actual unit costs in 2018 and 2019 were fuelled by higher spending.

Determined and Actual CAPEX by Year with Cumulative Difference



Portugal spent 27M€ more than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Romania did not achieve the RP2 targets for the Effectiveness of Safety Management (EoSM) in 2019 and it did not improve its minimum EoSM level during RP2. ROMATSA has achieved the targets level for safety culture since 2015 and for other Management Objectives since 2017. Romania and ROMATSA achieved the RP2 targets for the application of the Risk Classification Scheme since 2015.
- All occurrence rates except Air Traffic Management Specific (ATM-S) remained below the Union-wide averages over RP2. The rate of Runway Incursions (RIs), Airspace Infringements (AIs) and ATM-S increased relative to 2015 with ATM-S increasing in 2019 to be above the Union-wide average.

Environment:

- Romania did not contribute positively towards DANUBE FAB's actual horizontal flight efficiency environment targets (KEA) since 2016; although the planned horizontal flight efficiency (KEP) targets were achieved. Given the significant deterioration in performance during 2019, a detailed analysis using PRU data revealed that a new airport reporting data from Turkey led to the availability of new information that impacted KEA without significant underlying change in performance.
- Terminal vertical flight efficiency improved as more flights completed fully continuous climb/descent at both of Romania's regulated airports in 2019 compared to 2015. On average, airspace users spent 3.42 additional minutes per flight taxiing out or in terminal airspace in 2019. Only one out of two of regulated airports supplied all the data required for terminal environmental performance since 2017.

Capacity:

- Romania did not contribute positively towards achieving Danube FAB's en route Air Traffic Flow Management (ATFM) delay per flight targets by exceeding the national target in 2019, and in most years of RP2. Average en route ATFM delay per flight was 0.11 minute per flight in 2019, reducing slightly from 0.12 minute per flight in 2018.
- The number of instrument flight rules (IFR) movements in 2019 was 1% higher than in 2018 while the en route ATFM delay per flight decreased by 8%. The evolution of IFR movements remained above the STATFOR high growth forecast throughout RP2.
- ATC equipment (45% of total delay), special events (36% of total delay) and weather (18% of total delay) were identified as the main causes. ATFM measures related to the implementation of a new ATM system were categorised under the special event delay code and were considered as temporary in nature.

Cost-efficiency:

- Romania did not achieve the en route cost-efficiency target in 2019 with the actual unit cost (29.98€$_{2009}$) being higher than the determined unit cost (29.81€$_{2009}$).
- In 2019, en route actual costs were below the determined costs by -1.5%. Despite having most of the cost categories below the determined costs, Romania included a substantial amount for exceptional costs which are not detailed in its annual monitoring report.
- Romania underspent -41M€$_{2009}$ over RP2 (-49% of the determined CAPEX). Romania did not respect the CAPEX planning, with some of the projects not following the expected timeline. Following the revision of the performance plan for 2018 and 2019, several projects have been shifted to RP3. As a result of the incorrect planning, in 2019 Romania charged +3.6M€$_{2009}$ (+21.6M€$_{2009}$ over RP2) in costs of capital and depreciation for investments not materialised. Romania should take into accounts these amounts when developing the RP3 performance plan.

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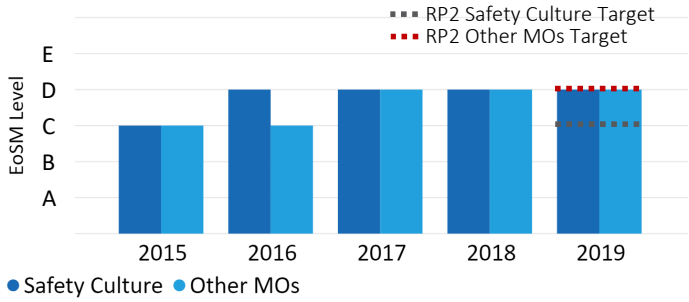
Romania Factsheet

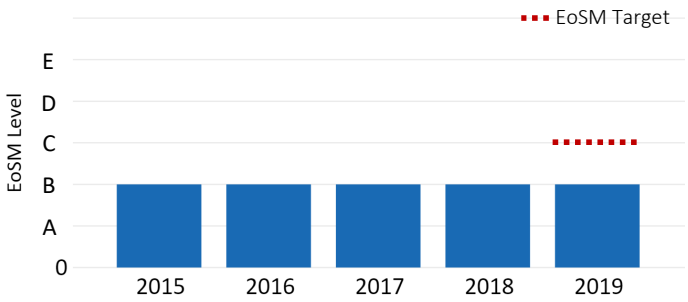
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



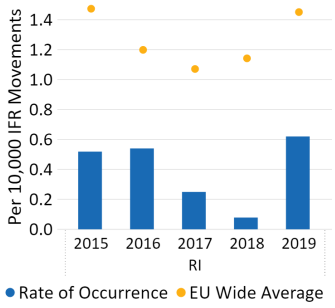
ROMATSA has achieved the targets level for safety culture since 2015 and for other Management Objectives since 2017.

State Effectiveness of Safety Management (EoSM) by Year

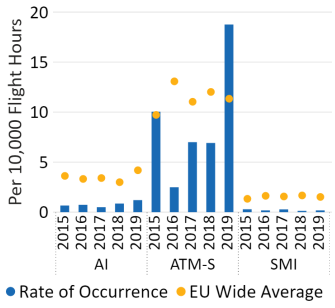


Romania did not achieve the targets for the EoSM in 2019 and it did not improve its minimum EoSM level during RP2.

Runway Incursions (RIs) by Year

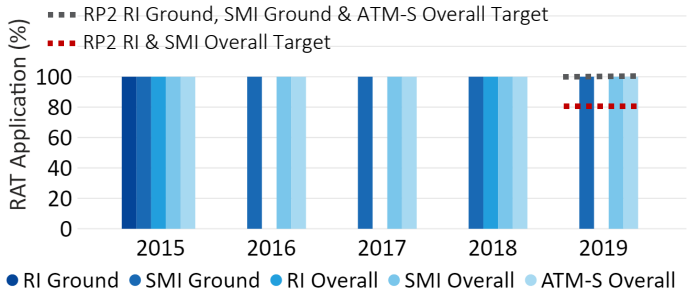


Occurrences by Type and Year



Rates of ATM S increased in 2019 to exceed the Union wide average.

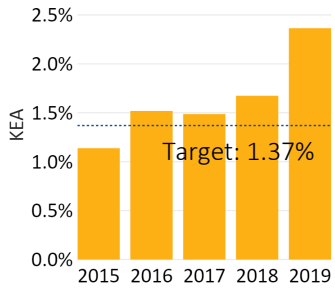
Risk Analysis Tool (RAT) Application to Severity Classification



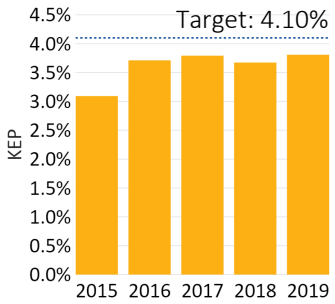
In 2019, Romania and ROMATSA achieved the targets for the application of the RAT to severity classification.

Environment

RP2 KEA Performance

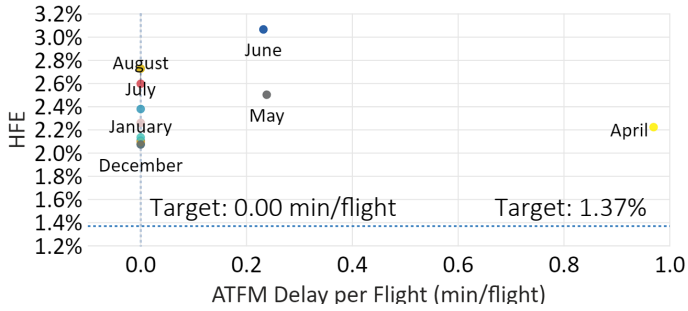


RP2 KEP Performance



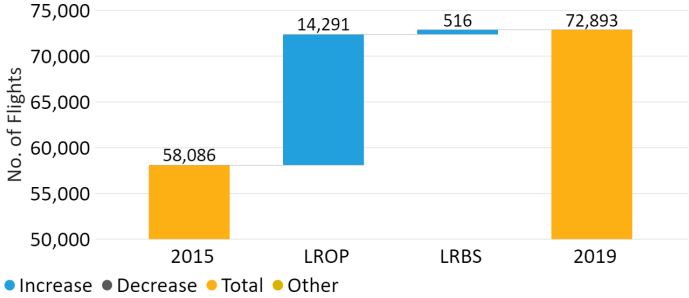
Romania did not contribute positively to the FAB KEA target in 2019. Romania achieved the KEP targets in all years of RP2.

ATFM Delay per Flight and HFE by Month in 2019



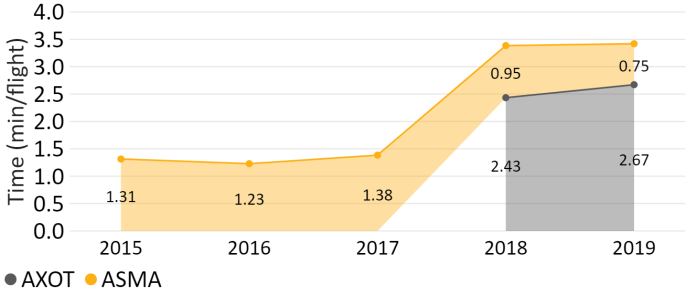
Romania incurred almost zero delays in most months meaning its capacity impact on environmental performance was small.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations increased at regulated airports during RP2 by 14,807 flights.*

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



3.42 minutes of AXOT and ASMA was endured by airspace users in Romania (1/2 regulated airports reported all data in 2018).

*This figure was updated in edition 2.0 of this document

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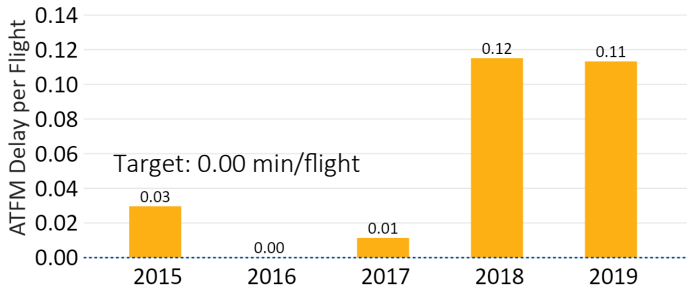
Romania Factsheet

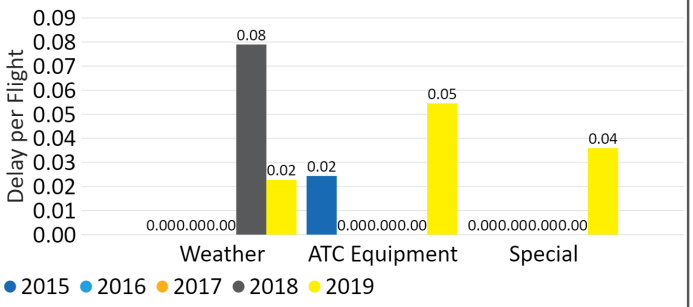
Capacity

ATFM Delay per Flight (min/flight)



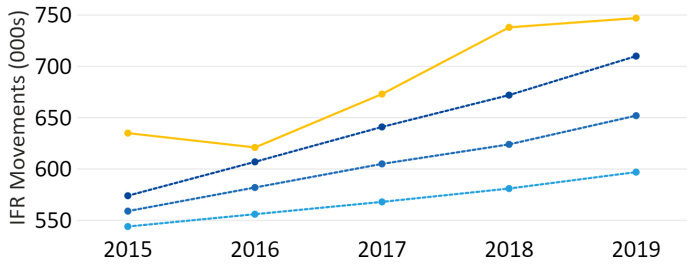
Delays in Romania stayed similar to 2018 in 2019. Romania did not achieve the targets in 2019.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



Weather, ATC equipment and special were the leading delay reasons contributing 18%, 45% and 36% of 2019 delays respectively.

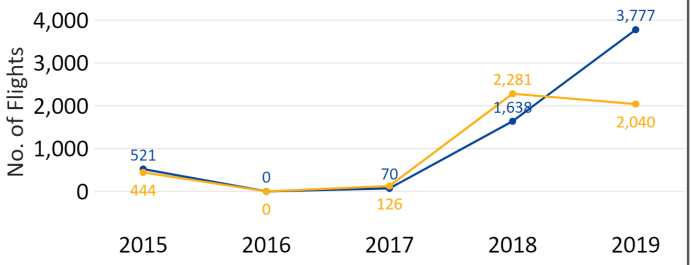
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were 5% above the STATFOR February 2014 high forecast.

Distribution of Delays (ROMATSA)

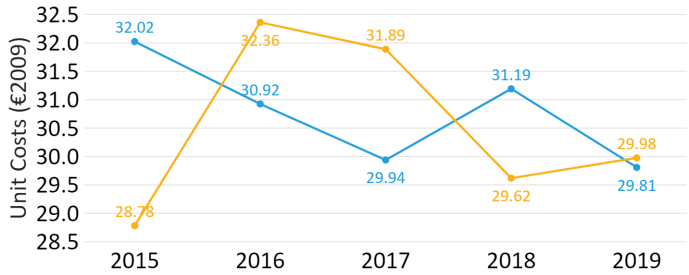


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

ROMATSA delayed 2,040 flights by more than 15 minutes in 2019, which was 35% of all delayed flights.

Cost-efficiency

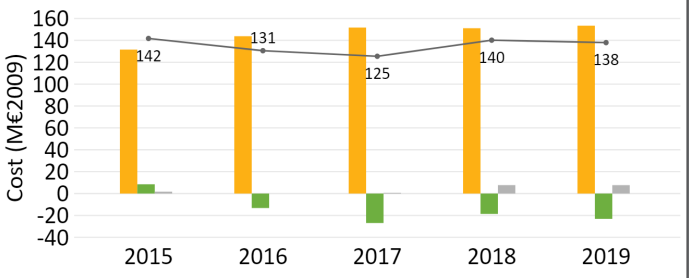
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

In 2019, actual units costs were 1% higher than determined unit costs.

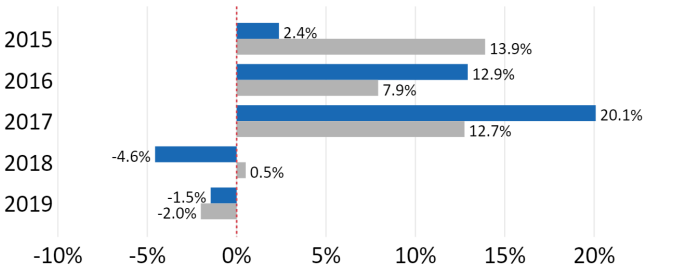
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Romania decreased during 2019 (-1%).

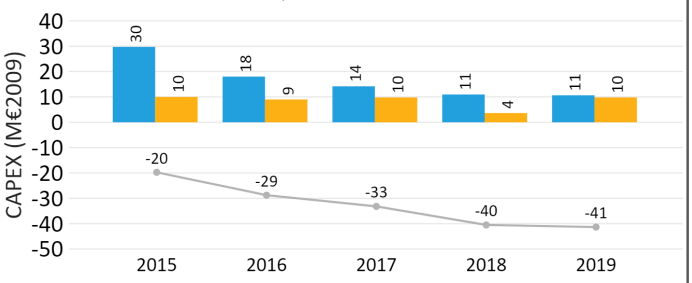
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Higher actual costs in 2019 were caused by lower service units.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Romania spent 41M€ less than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Slovakia did not achieve the RP2 targets for the Effectiveness of Safety Management (EoSM) in 2019 and it did not improve its minimum EoSM level over RP2.
- LPS SR achieved the target level for all Management Objectives since 2015.
- Slovakia and LPS SR have achieved the RP2 targets for the application of the Risk Classification Scheme since 2018.
- Over the RP2 period the rate Air Traffic Management Specific (ATM-S) and Separation Minima Infringements (SMIs) improved relative to 2015. Runway Incursions (RI) and Airspace Infringements (AI) have remained on comparable level relative to 2015. In 2019 all rates were below Union-wide averages.

Environment:

- Slovakia did not contribute positively towards FAB CE ‡ actual horizontal flight efficiency environment targets (KEA) in any year of RP2 although the planned horizontal flight efficiency (KEP) targets were achieved since 2015.
- Weather, capacity bottlenecks in western Europe and airspace users opting for cheaper routes were cited by the NSA as causes for the underperformance. However, the targets were not met in any month—even when there were minimal delays in Slovakia and when other FAB CE members could perform better.
- KEA and en route delays show a correlation of +0.8% per minute of delay in Slovakia, which suggests improving capacity could improve environmental performance.
- Terminal vertical flight efficiency improved as more flights completed fully continuous climb/descent at Bratislava Airport in 2019 compared to 2015.
- On average, airspace users spent 0.95 additional minutes per flight taxiing out or in terminal airspace. Bratislava airport provided all the data required to calculate terminal environmental performance since 2018.

Capacity:

- Slovakia positively contributed to the FAB CE performance in the capacity KPA. Having missed the national capacity target by 110% in 2018; in 2019, it managed to reduce the average Air Traffic Flow Management (ATFM) delay per flight from 0.21 minutes down to 0.07 minutes and accomplished the 2019 national capacity target (0.10 minutes).
- Actual instrument flight rules (IFR) movements kept above STATFOR February 2014 high traffic growth scenario.
- In 2019, Slovakia offered +4% higher than required capacity which, together with the decrease in adverse weather and IFR movements in the Slovakian FIR, resulted in a 67% improvement of average ATFM en route delays.
- Most of the delays were attributed to ATC capacity (43%) and weather (57%).

Cost-efficiency:

- Slovakia achieved the en route cost-efficiency target in 2019, with the actual unit cost (42.24€$_{2009}$) being lower than the determined unit cost (43.64€$_{2009}$). Slovakia achieved the en route cost-efficiency targets in each year of RP2.
- In 2019, en route actual costs were below the determined costs by -5%. The higher than determined staff costs (due to legislation changes in social and health insurance from 2017) has been compensated by savings in the other cost categories.
- In 2019, Slovakia underspent -2M€$_{2009}$ in CAPEX (-33M€$_{2009}$ over RP2). Most of the underspending is due to the delay in the hardware upgrade of the main ATM system.
- As a result of the underinvestment in 2019, Slovakia charged +3.6M€$_{2009}$ (+7.9M€$_{2009}$ over RP2) in costs of capital and depreciation for investments not materialised. Slovakia should take into account these amounts when developing the RP3 performance plan.

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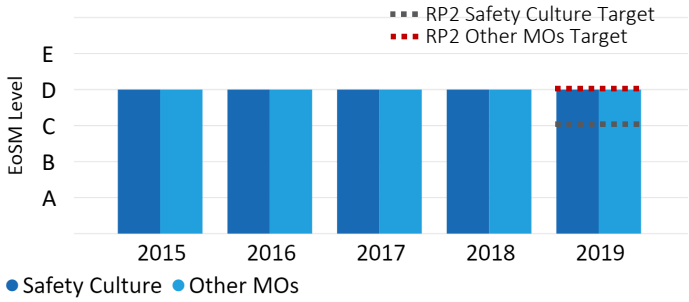
Slovakia Factsheet

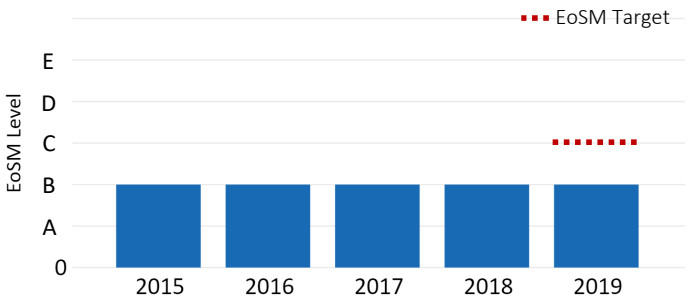
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



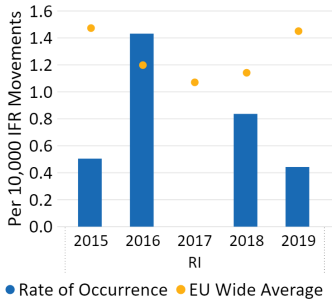
LPS SR has achieved the targets for the EoSM in all safety areas since 2015.

State Effectiveness of Safety Management (EoSM) by Year

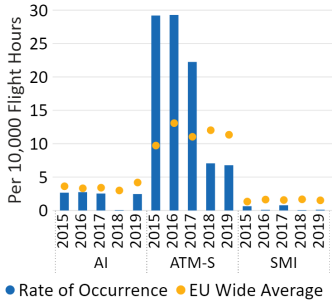


Slovakia did not achieve the RP2 targets for the EoSM in 2019 and it did not improve its minimum EoSM level over RP2.

Runway Incursions (RIs) by Year

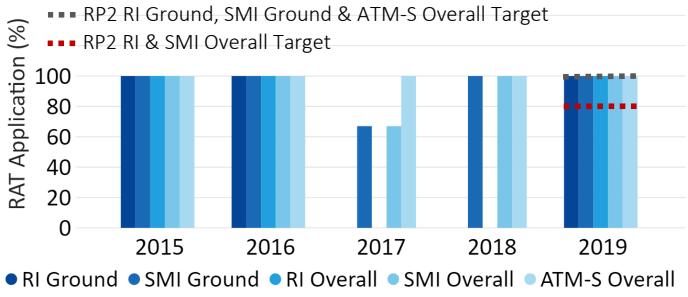


Occurrences by Type and Year



Between 2018 and 2019, RI, SMI and ATM-S decreased and remained below the Union-wide average.

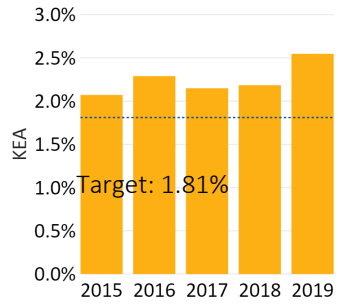
Risk Analysis Tool (RAT) Application to Severity Classification



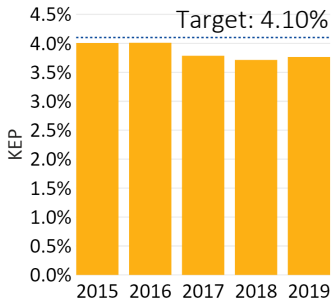
Slovakia and LPS SR achieved the targets for the application of the RAT to severity classification since 2018.

Environment

RP2 KEA Performance

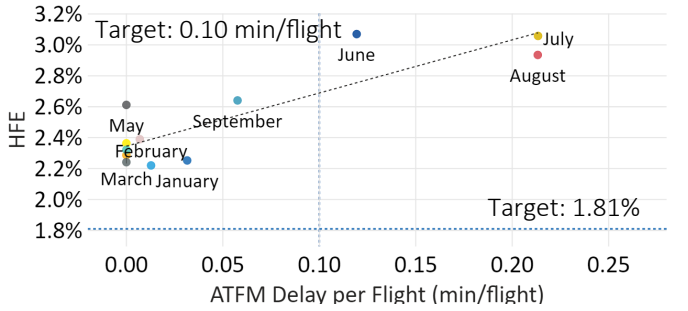


RP2 KEP Performance



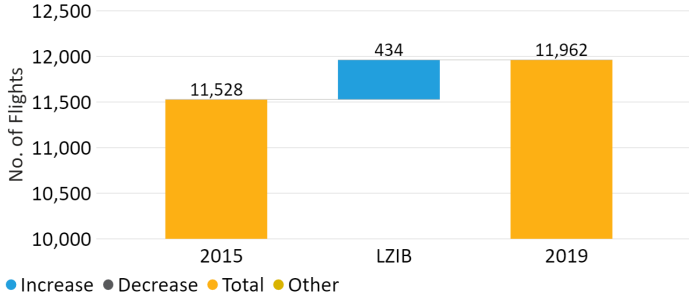
Slovakia did not contribute to the FAB KEA target in 2019. Slovakia did contribute to the KEP targets in all years of RP2.

ATFM Delay per Flight and HFE by Month in 2019



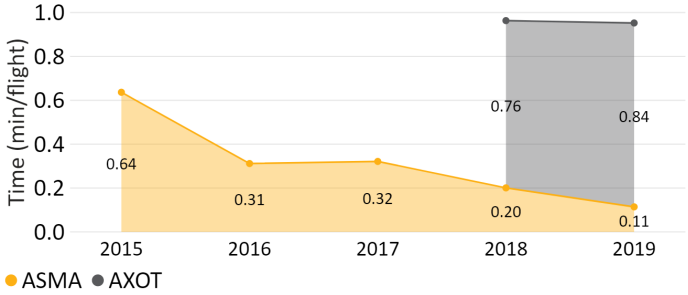
Each minute of additional en route ATFM delay per flight in 2019 correlated with a circa 0.8% increase in HFE.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations increased at regulated airports during RP2 by 434 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



0.95 minutes of AXOT and ASMA was endured by airspace users in Slovakia (1/1 regulated airports reported data).

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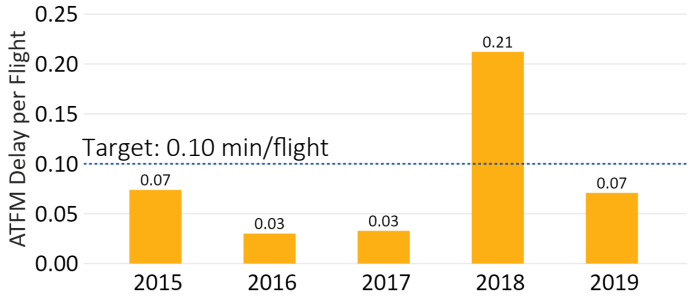
Slovakia Factsheet

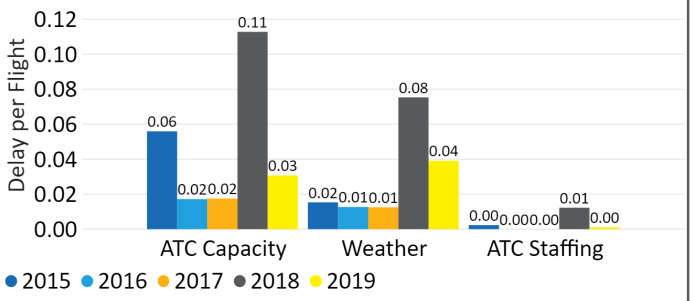
Capacity

ATFM Delay per Flight (min/flight)



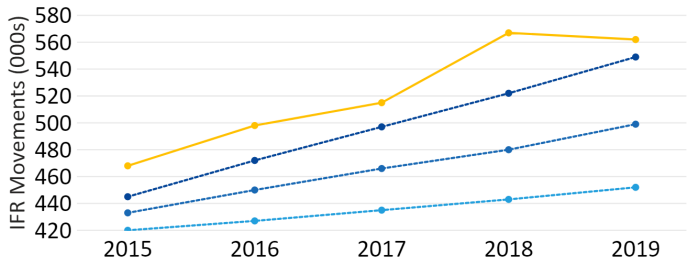
Delays in Slovakia decreased year-on-year by 67% in 2019, which helped it achieve the target.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



ATC capacity and weather were the leading delay reasons contributing 43% and 57% of 2019 delays respectively.

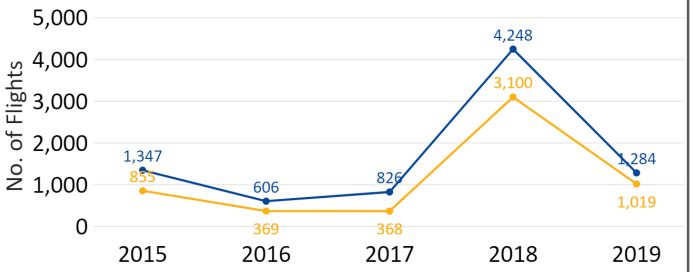
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were 2% above the STATFOR February 2014 high forecast.

Distribution of Delays (LPS)

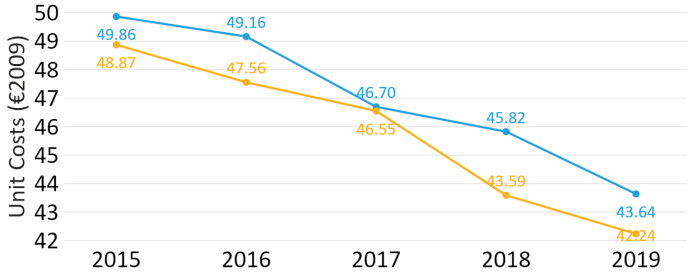


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

LPS SR delayed 1,019 flights by more than 15 minutes in 2019, which was 44% of all delayed flights.

Cost-efficiency

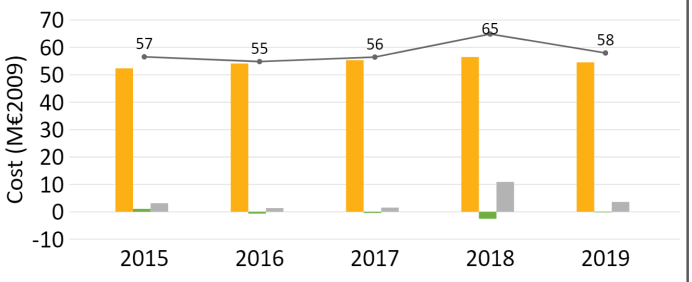
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower in each year of RP2. In 2019, actual unit costs were 3% lower than planned.

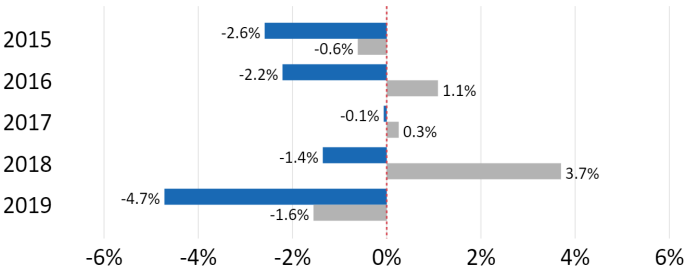
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Slovakia decreased during 2019 (-11%).

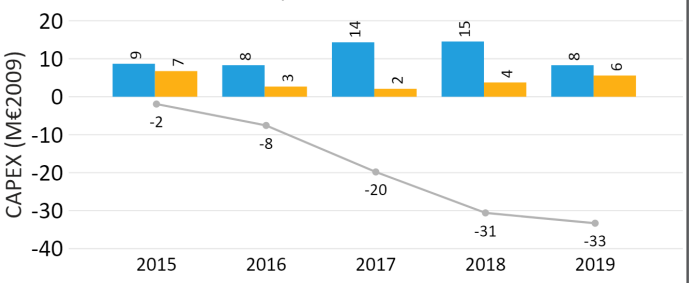
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Lower actual unit costs were helped by lower spending in each year of RP2.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Slovakia spent 33M€ less than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Slovenia achieved the RP2 targets for the Effectiveness of Safety Management (EoSM) in 2019.
- Slovenia Control achieved the targets level for safety culture since 2017, and for other Management Objectives since 2018.
- Slovenia and Slovenia Control have achieved the RP2 targets for the application of the Risk Classification Scheme in 2019.
- Over the RP2 period the Runway Incursions (RIs) and Air Traffic Management Specific (ATM-S) occurrences improved compared to 2015, falling below the Union-wide averages. Separation Minima Infringements (SMIs) and Airspace Infringements (AIs) remained stable, below the Union-wide averages during all RP2.

Environment:

- Slovenia contributed positively towards FAB CE's actual horizontal flight efficiency environment targets (KEA) in each year of RP2. The planned horizontal flight efficiency (KEP) targets were also achieved.
- Terminal vertical flight efficiency improved as more flights completed fully continuous climb/descent at Slovenia's regulated airports overall in 2019 compared to 2015.
- On average, airspace users spent 2.10 additional minutes per flight taxiing out or in terminal airspace in 2019 and only Ljubljana airport provided all the data required since 2016. Relative to 2016 the terminal environmental performance has worsened.

Capacity:

- Slovenia contributed positively towards FAB CE's en route Air Traffic Flow Management (ATFM) delay per flight target in 2019, as well as in all other years of RP2.
- Traffic growth was higher than the STATFOR February 2014 high scenario, with a year-on-year increase of 9% in instrument flight rules (IFR) movements. Despite this fact, total en route delays decreased by -56% compared to 2018.
- ATC capacity and weather were the main codes used to explain the delays (neither of them being especially significant).
- The proportion of flights which were delayed by more than 15 minutes was 43%, which compared to the 51% in 2018 is almost an eight percentage point decrease.

Cost-efficiency:

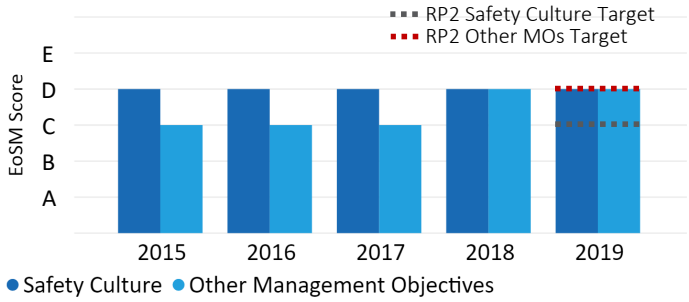
- Slovenia achieved the en route cost-efficiency target in 2019 with the actual unit cost (48.15€$_{2009}$) being lower than the determined unit cost (52.90€$_{2009}$). Slovenia achieved the en route cost-efficiency targets from 2017.
- In 2019, en route actual costs were above the determined costs by +4.5%. The difference was due to a lower inflation rate than planned (nominal actual costs are -2% than determined).
- In 2019 Slovenia underspent -1.5M€$_{2009}$ in CAPEX (-3.3M€$_{2009}$ over RP2). The main source of the variation is due to the ATM system upgrade, which despite the performance plan has not been started yet.

PRB Performance review body of the single european sky

Slovenia Factsheet

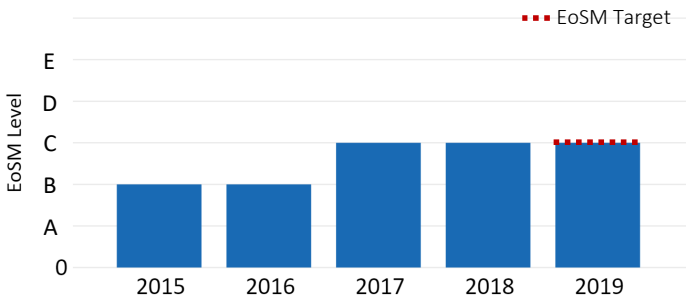
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



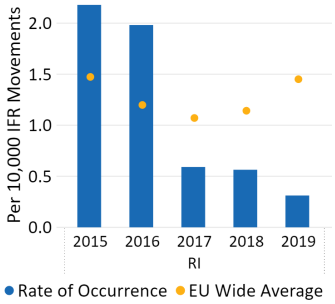
Slovenia Control achieved the targets level for safety culture since 2017 and for other MOs since 2018.

State Effectiveness of Safety Management (EoSM) by Year

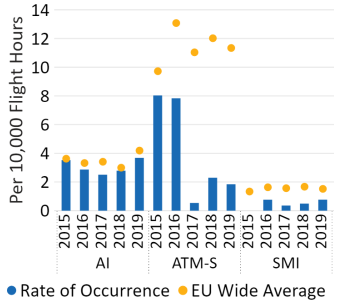


Slovenia has achieved the targets for the EoSM in all MOs since 2017.

Runway Incursions (RIs) by Year

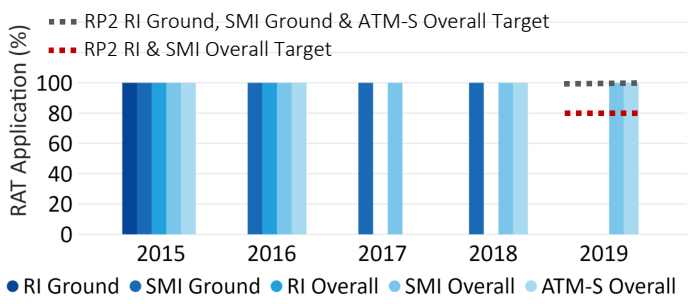


Occurrences by Type and Year



Rates of SMIs and AIs increased in 2019 compared with 2018. All rates remain below the Union-wide average.

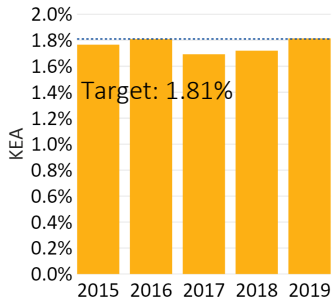
Risk Analysis Tool (RAT) Application to Severity Classification



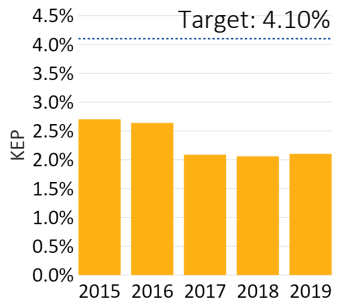
In 2019, Slovenia and Slovenia Control achieved the targets for the application of the RAT to severity classification.

Environment

RP2 KEA Performance

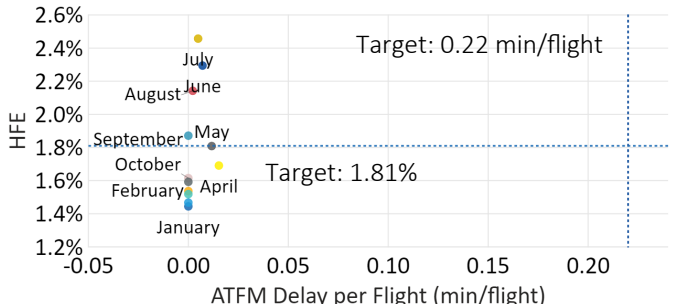


RP2 KEP Performance



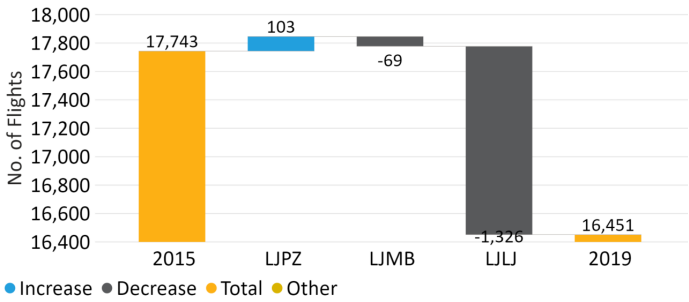
Slovenia contributed towards the FAB KEA target and Union-wide KEP target in every year of RP2.

ATFM Delay per Flight and HFE by Month in 2019



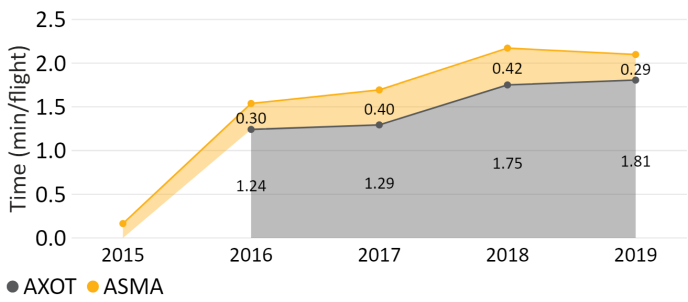
Given that Slovenia had many months of close to zero delays, no specific correlation exists between KEA and delays.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations increased at regulated airports during RP2 by 1,292 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



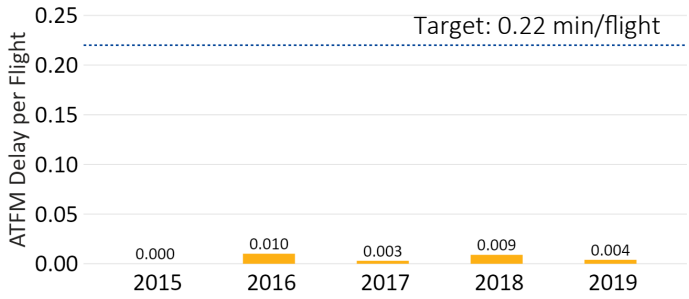
2.10 minutes of AXOT and ASMA was endured by airspace users in Slovenia (1/1 regulated airports reported data since 2016).

PRB Performance review body of the single european sky

Slovenia Factsheet

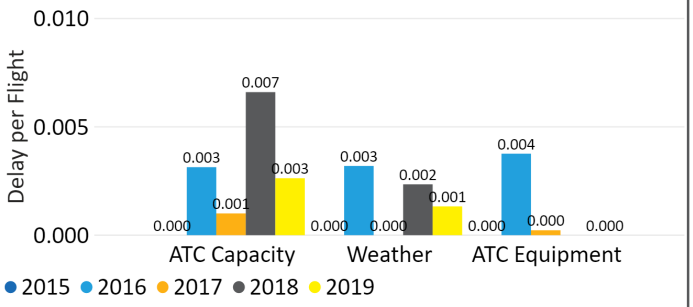
Capacity

ATFM Delay per Flight (min/flight)



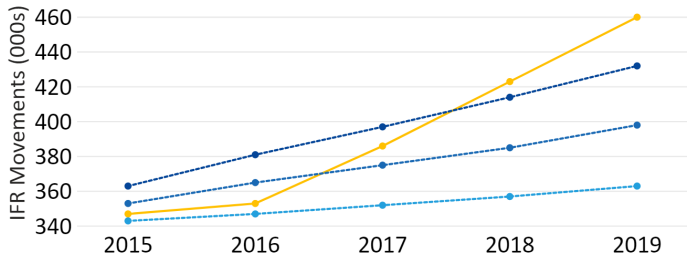
Delays in Slovenia remained low in 2019. Slovenia continued to achieve the targets in 2019.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



ATC capacity and weather were the leading delay reasons contributing towards the minimal delays in Slovenia.

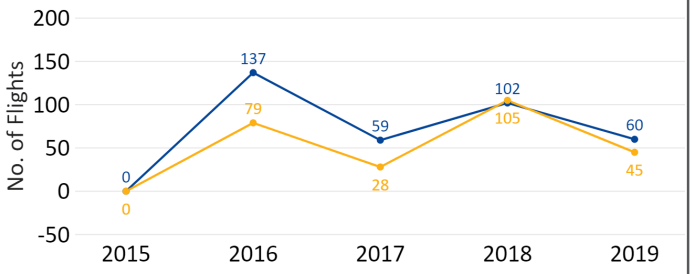
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were 6% above the STATFOR February 2014 high forecast.

Distribution of Delays (Slovenia Control)

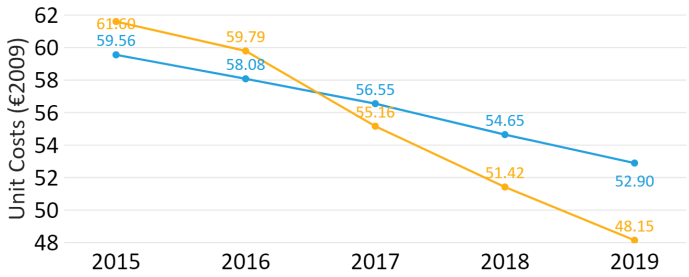


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

Slovenia Control delayed 45 flights by more than 15 minutes in 2019, which was 43% of all delayed flights.

Cost-efficiency

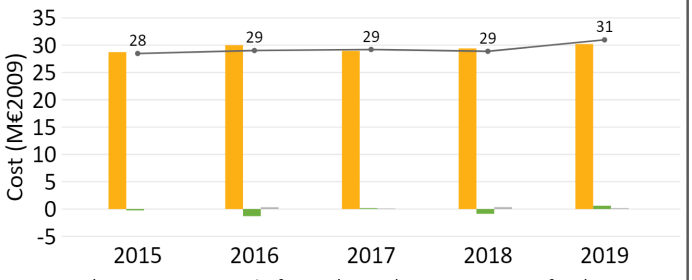
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower than planned since 2017. In 2019, actual unit costs were 9% lower than planned.

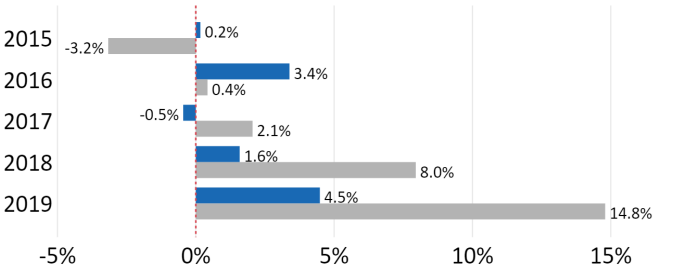
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Slovenia increased during 2019 (+6.8%).

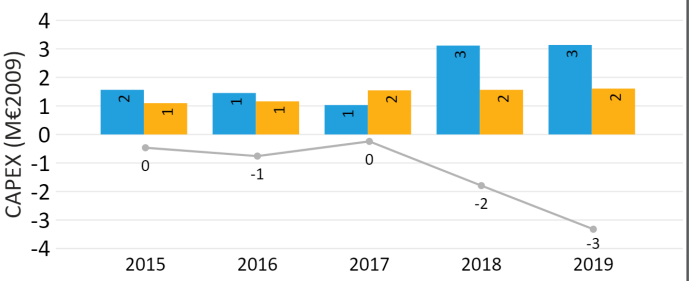
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Lower actual unit costs since 2017 were fuelled by higher than planned service units.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Slovenia spent 3M€ less than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Spain did not achieve the RP2 targets for the Effectiveness of Safety Management (EoSM) in 2019 and it did not improve its minimum EoSM level over RP2. ENAIRE achieved the target level for all Management Objectives since 2015. ENAIRE achieved the RP2 targets for the application of the Risk Classification Scheme in 2019. Spain did not.
- Relative to 2015 all occurrence rates have increased over RP2. In 2019, all rates exceeded the Union-wide averages.

Environment:

- Spain did not contribute positively towards SW FAB's actual horizontal flight efficiency environment targets (KEA). The planned horizontal flight efficiency (KEP) targets were not achieved either.
- KEA and en route delays show a correlation of +1.0% per minute of delay in Spain, which suggests improving capacity could improve environmental performance.
- The NSA monitoring report claimed that SW FAB has been severely impacted by the eNM re-routing actions in the summer with traffic to the Canary Islands re-routed westwards causing substantial issues.
- Terminal vertical flight efficiency improved as more flights completed fully continuous climb/descent at all of Spain's regulated airports in 2019 compared to 2015.
- On average, airspace users spent 5.00 additional minutes per flight taxiing out or in terminal airspace which is an improvement relative to 2018 but slightly worse than in 2015.

Capacity:

- Spain did not positively contribute to the SW FAB achievement of the en route Air Traffic Flow Management (ATFM) delay target. Although delays decreased by 22% compared to 2018, Spain continued to miss the national targets for the whole of RP2.
- Actual instrument flight rules (IFR) movements kept well above the STATFOR February 2014 high traffic growth scenario with a slight decrease in traffic growth between 2018 and 2019. According to Network Operations Report (NOP) 2019, Spain was the main contributor to the network traffic growth.
- The main causes of ATFM en route delays include ATC capacity, weather and ATC staffing. According to the NOP 2019 – 2024, Madrid ACC did not offer its planned capacity which resulted in 60% more delays in this sector than in 2018.
- All remaining Area Control Centres decreased or only slightly increased (Barcelona ACC) their ATFM delays.

Cost-efficiency:

- Spain continental achieved the en route cost-efficiency target in 2019, with the actual unit cost (47.32€$_{2009}$) being lower than the determined unit cost (59.06€$_{2009}$). Spain continental achieved the en route cost-efficiency targets in each year of RP2.
- Spain Canarias achieved the en route cost-efficiency target in 2019, with the actual unit cost (45.19€$_{2009}$) being lower than the determined unit cost (55.38€$_{2009}$). Spain Canarias achieved the en route cost-efficiency targets from 2017.
- Spain continental and Canarias actual costs were in line with the determined costs. Spain can be considered as a good example of cost planning.
- In 2019, Spain overinvested +24.5M€$_{2009}$ in CAPEX (+21.9M€$_{2009}$ over RP2).
- Despite the overinvestment, in 2019 Spain charged +6.6M€$_{2009}$ (+37.05M€$_{2009}$ over RP2) in cost of capital more than planned (due to a lower than expected asset base). Spain should take into account these amounts when developing the RP3 performance plan.

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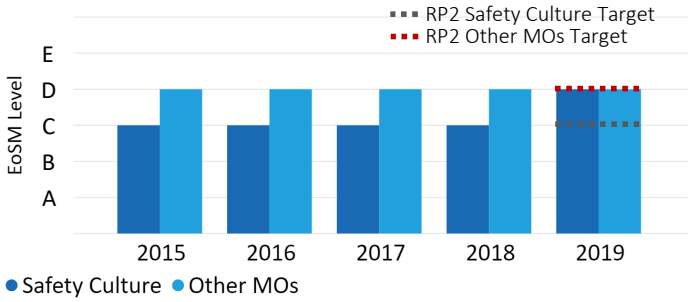
Spain Factsheet

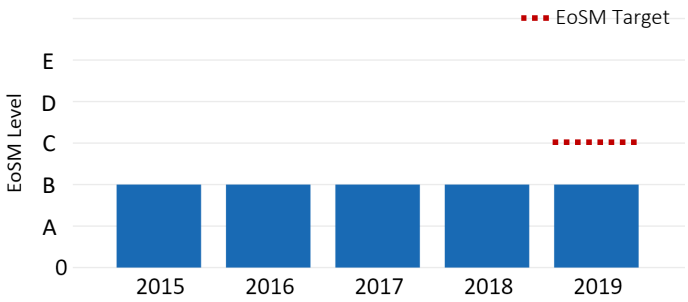
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



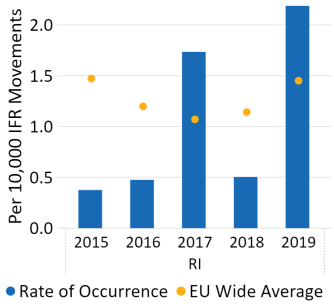
ENAIRE has achieved the targets for the EoSM in all safety areas since 2015.

State Effectiveness of Safety Management (EoSM) by Year

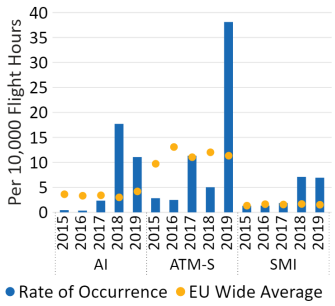


Spain did not achieve the RP2 targets for the EoSM in 2019 and it did not improve its minimum EoSM level over RP2.

Runway Incursions (RIs) by Year

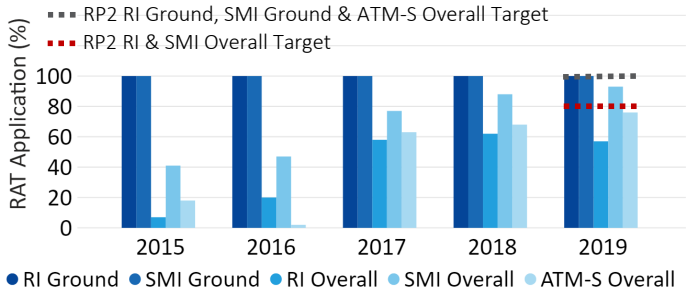


Occurrences by Type and Year



The rate of RIs and ATM-S' increased in 2019. All rates are above Union-wide averages in 2019.

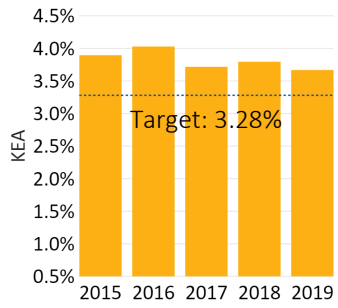
Risk Analysis Tool (RAT) Application to Severity Classification



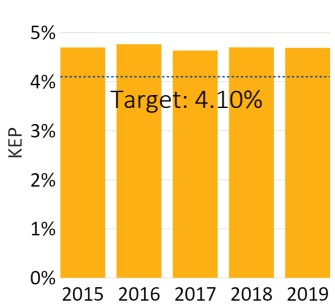
ENAIRE achieved the RP2 targets for the application of the Risk Classification Scheme in 2019. Spain did not.

Environment

RP2 KEA Performance

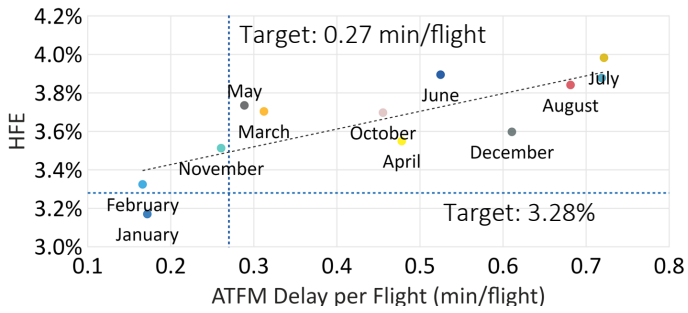


RP2 KEP Performance



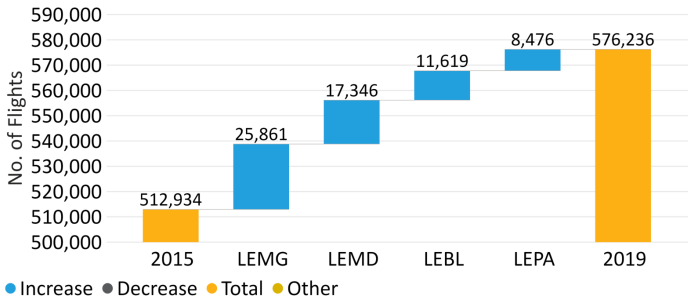
Spain did not contribute to the FAB KEA target or Union-wide KEP target in any year of RP2.

ATFM Delay per Flight and HFE by Month in 2019



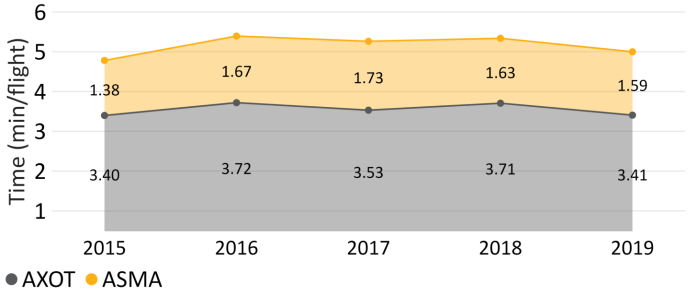
Each minute of additional en-route ATFM delay per flight correlated with a circa 1% increase in KEA.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations increased at 4/5 regulated airports during RP2 by 63,302 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



5 minutes of AXOT and ASMA was endured by airspace users in Spain (5/5 regulated airports reported all data in 2017).

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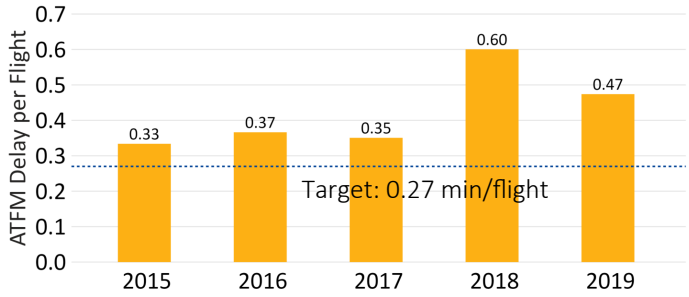
Spain Factsheet

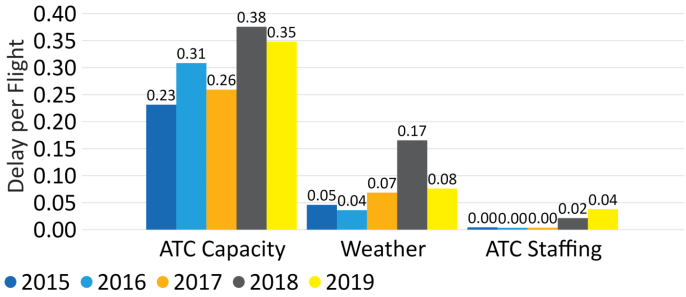
Capacity

ATFM Delay per Flight (min/flight)



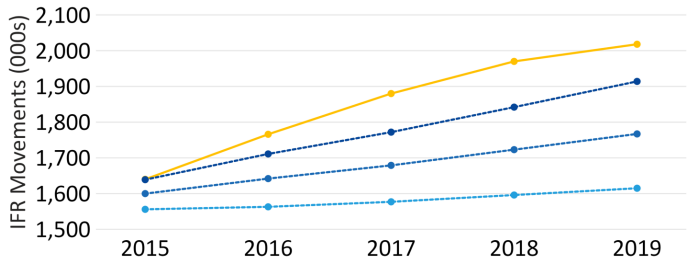
Delays in Spain decreased by 22% in 2019 compared to 2018. Spain missed the capacity targets in each year of RP2.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



ATC capacity, weather and staffing were the leading delay reasons contributing 74%, 17% and 9% of the delays respectively.

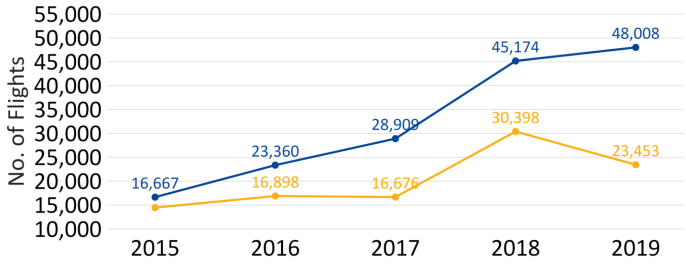
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were 5.4% above the STATFOR February 2014 high forecast.

Distribution of Delays (ENAIRE)

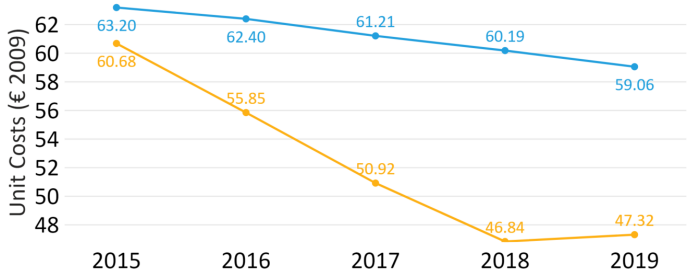


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

ENAIRE delayed 23,453 flights by more than 15 minutes in 2019, which was 33% of all delayed flights.

Cost-efficiency (Continental)

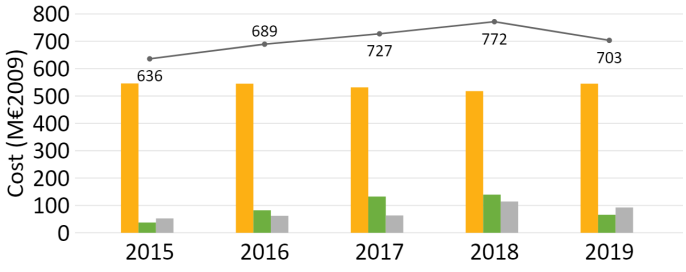
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower than planned in each year of RP2. In 2019, actual unit costs were 20% lower than planned.

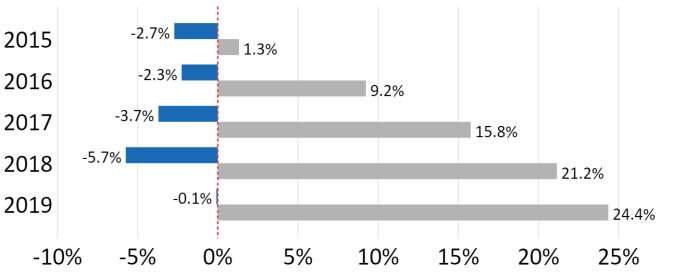
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Spain decreased during 2019 (-8.9%).

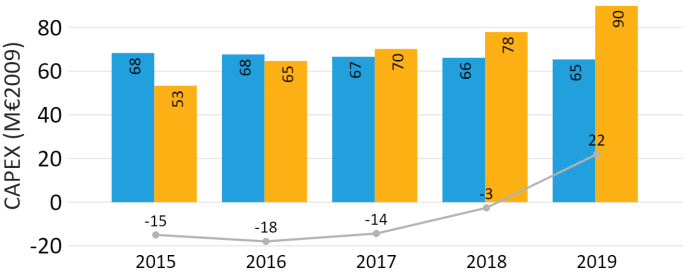
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Lower actual unit costs were fuelled by lower spending and higher service units.

Determined and Actual CAPEX by Year with Cumulative Difference

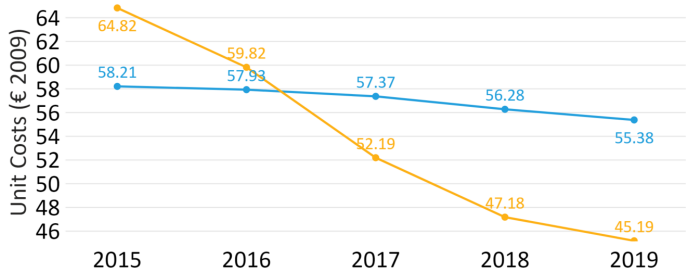


1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Spain spent 22M€ more than planned on CAPEX projects during RP2.

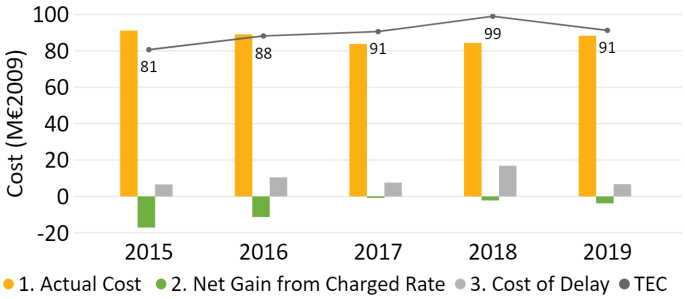
Cost-efficiency (Canarias)

Determined and Actual Unit Costs by Year



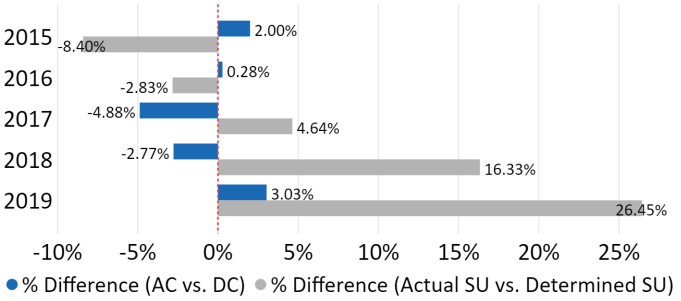
Actual unit costs were lower than planned since 2017. In 2019, actual unit costs were 19% lower than planned.

Total Economic Cost (TEC) and Cost Components by Year



The year-on-year total economic cost for airspace users to use air navigation services in the Canarias decreased in 2019 (-8.1%).

% Difference between Actual and Determined Costs and Service Units by Year



Lower actual unit costs from 2017 were fuelled by higher service units.

CAPEX data is shown on the continental charging zone.

Comments from the Performance Review Body:

Safety:

- Sweden did not achieve the RP2 targets for the Effectiveness of Safety Management in 2019.
- For the Effectiveness of Safety Management, LFV achieved the RP2 targets for safety culture from 2015 onwards but did not achieve the targets for other MOs.
- Sweden and LFV have achieved the RP2 targets for the application of the Risk Classification Scheme in 2019.
- Over the RP2 period RI occurrences worsen compared to 2015, exceeding the EU-wide averages. SMIs, AIs and ATM-S improved slightly but still exceeded EU-wide averages. The SMIs remain on constant level just below the Union-wide averages.

Environment:

- Sweden did not contribute positively towards DK-SE's actual horizontal flight efficiency environment targets (KEA) in each year of RP2 but did achieve the planned horizontal flight efficiency targets (KEP).
- KEA and en route delays show a correlation of +0.5% per minute of delay in Sweden, which suggests improving capacity could improve environmental performance (2019 was the first year Sweden didn't achieve its capacity target).
- The preliminary results from a custom KEA analysis software used by LFV indicated that the route with the largest negative impact on the KEA, flown through Swedish airspace, is from Gdansk (EPGD) to Helsinki (EFHK) because of issues in Kaliningrad.
- Vertical flight efficiency in terms of the absolute number of flights conducting fully Continuous Climb Operations/ Continuous Descent Operations (CCO/CDO) decreased by almost 13,000 flights at Stockholm Arlanda airport during RP2.
- On average, airspace users spent 3.20 additional minutes per flight taxiing out or in terminal airspace – an improvement compared to 2018 but worse compared to 2015.

Capacity:

- Sweden did not contribute positively towards DK-SE FAB's capacity target in 2019 for the first time in RP2 achieving 0.10 minutes per flight of delay compared to the national target of 0.09 minutes of delay per flight.
- Sweden experienced a decline in IFR movements in 2019, traffic fell below the STATFOR February 2014 base forecast.
- Unlike for Stockholm ACC, the capacity offered for Malmo ACC was not able to provide the required service to anticipated or actual traffic. The most pertinent factors affecting performance were weather (40%), ATC capacity (30%), ATC equipment (10%) and staffing issues (10%).

Cost-efficiency:

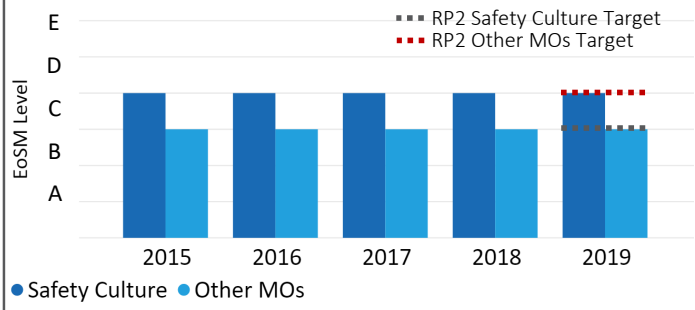
- Sweden did not achieve the en route cost-efficiency target in 2019 with the actual unit cost (47.96€$_{2009}$) being higher than the determined unit cost (46.73€$_{2009}$). Sweden never achieved the en route cost-efficiency targets during RP2.
- In 2019, en route actual costs were above the determined costs by +14.5%. Sweden has reported higher costs than determined in each year of RP2. Sweden should implement tighter cost cutting measures in order to contain costs.
- In 2019, Sweden overinvested +15M€$_{2009}$ in CAPEX (+42.0M€$_{2009}$ over RP2). The major source of this variation is the "RTC" project and "other CAPEX", however no specific details were provided. Sweden is recognised as an "early mover" when it comes to remote towers technology.

PRB Performance review body of the single european sky

Sweden Factsheet

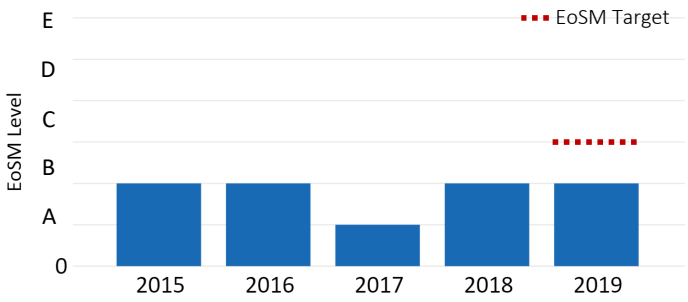
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



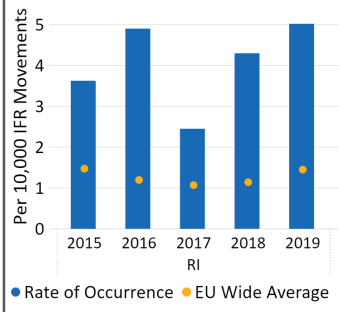
LFV achieved the targets for the EoSM for safety culture in 2015 but not for other Management Objectives.

State Effectiveness of Safety Management (EoSM) by Year

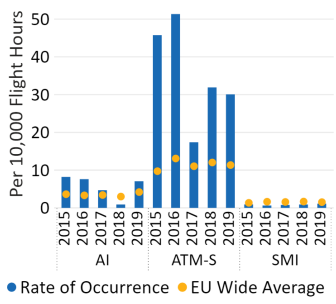


Sweden did not achieve the targets for the EoSM in all safety areas in 2019.

Runway Incursions (RIs) by Year

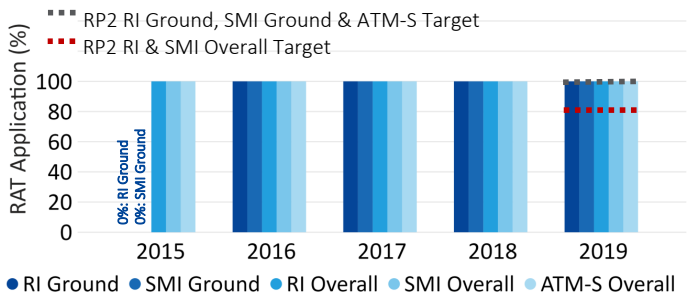


Occurrences by Type and Year



Between 2018 and 2019, rates of RIs and AI have increased and exceeded the Union-wide averages.

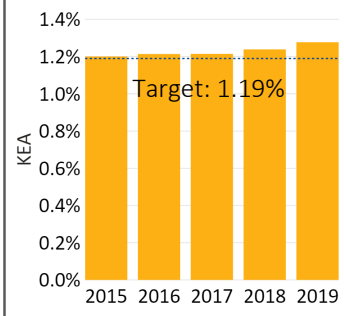
Risk Analysis Tool (RAT) Application to Severity Classification



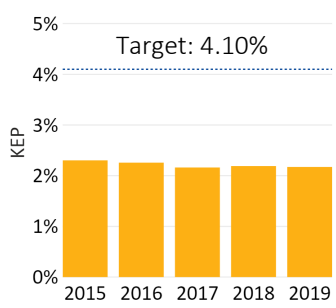
In 2019, Sweden and LFV achieved the targets for the application of the RAT to severity classification.

Environment

RP2 KEA Performance

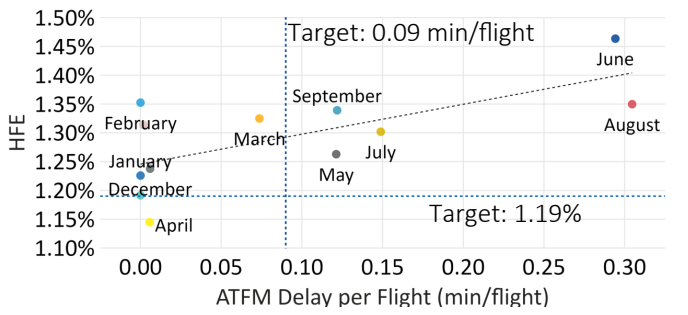


RP2 KEP Performance



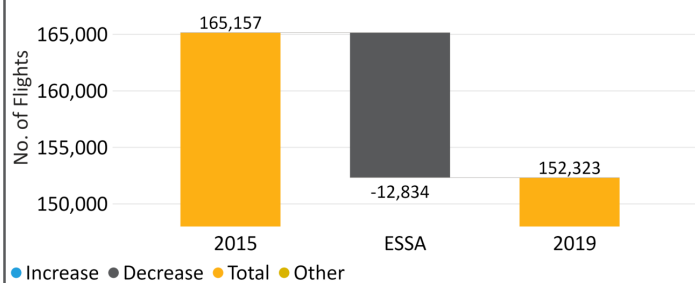
Sweden did not contribute towards DK-SE's KEA target in 2019. The KEP target was achieved in 2015 and in every year thereafter.

ATFM Delay per Flight and HFE by Month in 2019



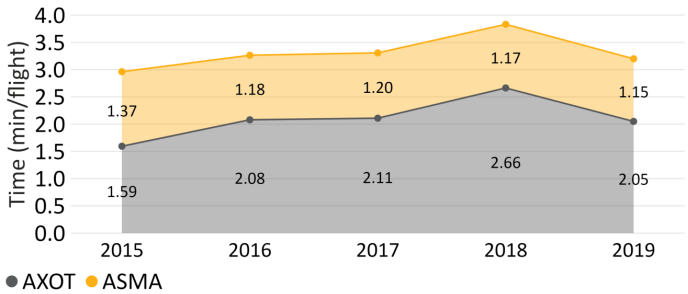
Each minute of additional en route ATFM delay per flight in 2019 correlated with a circa 0.5% increase in HFE.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations fell at Stockholm's main Airport during RP2 by 12,834 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



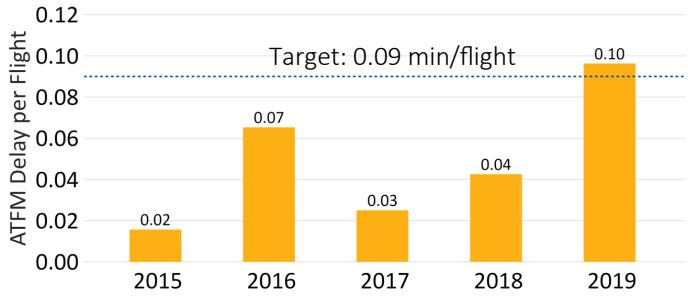
3.2 minutes of AXOT and ASMA were endured by airspace users in Sweden, which is better than 2018 but worse compared to 2015.

PRB Performance review body of the single european sky

Sweden Factsheet

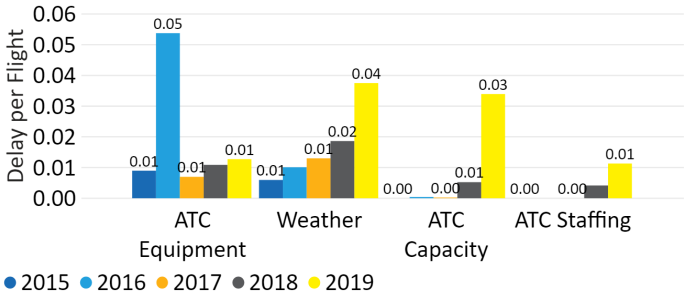
Capacity

ATFM Delay per Flight (min/flight)



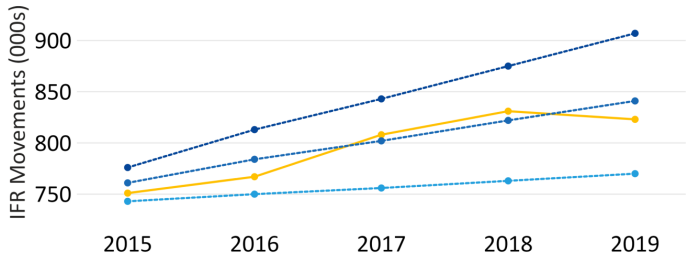
For the first time in RP2, Sweden did not contribute to DK-SE's FAB by 0.01 min/flight.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



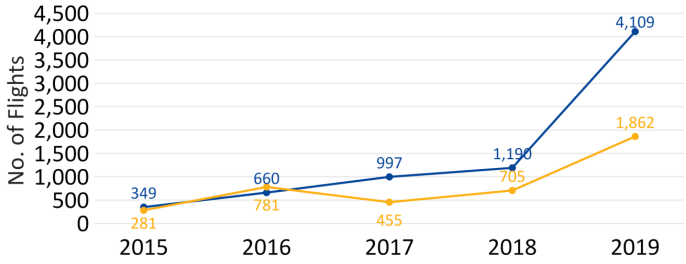
Weather, ATC capacity and equipment were the leading delay reasons contributing 40%, 30% and 10% of 2019 delays.

IFR Movements by Year and Forecast Type (STATFOR February 2014)



IFR movements in 2019 were 2.2% below the STATFOR February 2014 base forecast.

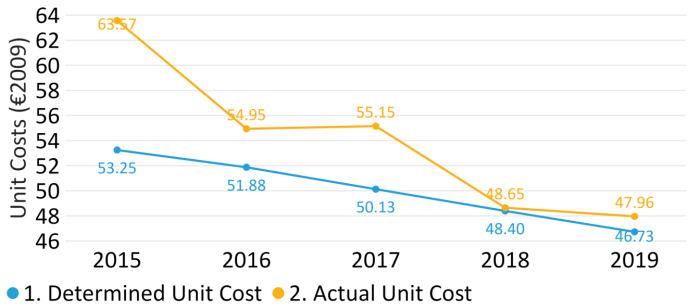
Distribution of Delays (LFV)



LFV delayed 1,862 flights by more than 15 minutes in 2019, which was 31% of all delayed flights, which is an improvement.

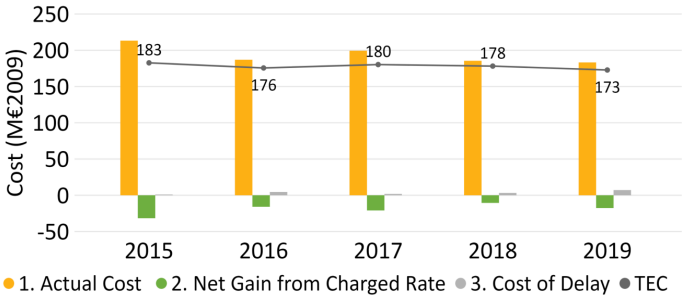
Cost-efficiency

Determined and Actual Unit Costs by Year



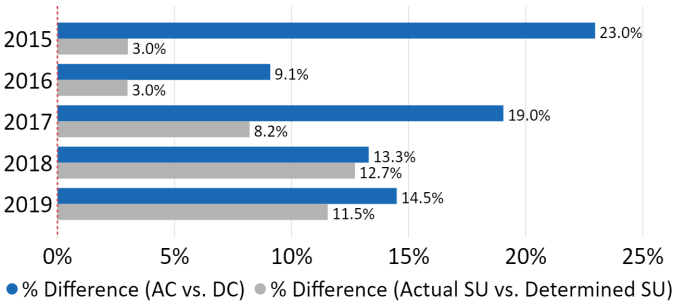
Actual unit costs were higher than planned in each year of RP2. In 2019, actual unit costs were 2.6% higher than planned.

Total Economic Cost (TEC) and Cost Components by Year



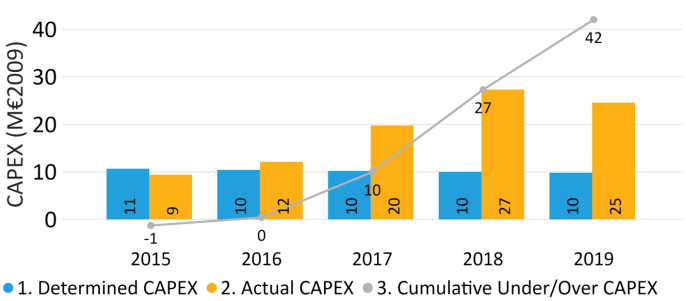
The year-on-year total economic cost for airspace users to use air navigation services in Sweden decreased in 2019 (-2.8%).

% Difference between Actual and Determined Costs and Service Units by Year



Higher actual unit costs were fuelled by higher than planned spending between in all years of RP2.

Determined and Actual CAPEX by Year with Cumulative Difference



Sweden spent 42M€ more than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- Switzerland achieved the RP2 targets for the Effectiveness of Safety Management (EoSM) since 2016.
- skyguide achieved the target for the EoSM for all Management Objectives in 2019.
- Switzerland and skyguide have achieved the RP2 targets for the application of the Risk Classification Scheme since 2015.
- Over the RP2 period, the rate of Runway Incursions (RIs) worsened in relation to 2015 while Separation Minima Infringements (SMIs), Airspace Infringements (AIs) and Air Traffic Management Specific (ATM-S) improved. RIs, SMIs and AIs exceeded Union-wide averages in 2019.

Environment:

- Switzerland did not contribute positively towards FABEC's actual or planned horizontal flight efficiency environment targets (KEA and KEP respectively) in any year of RP2.
- FABEC explained in their monitoring report that capacity issues were interdependent with environmental performance, however this does not apply to Switzerland since delays and KEA were not strongly correlated. Therefore, it is unclear what the specific causes of underperformance were in Switzerland.
- Terminal vertical flight efficiency did not improve as fewer flights completed fully continuous climb/descent at Swiss airports in 2019 compared to 2015.
- On average, airspace users spent 5.81 additional minutes per flight taxiing out or in terminal airspace. This remained stable throughout RP2 with no significant improvement or deterioration in performance.

Capacity:

- Switzerland contributed positively towards FABEC's en route Air Traffic Flow Management (ATFM) delay per flight target in 2019 with an achievement of 0.15 minutes of average ATFM delay per flight compared to the national target of 0.23 minutes per flight.
- The number of instrument flight rules (IFR) movements in 2019 stayed between the STATFOR February 2014 base and high growth forecast. The slow down in traffic growth and the achieved capacity enhancement measures resulted in a 52% reduction of en route ATFM delay per flight compared to 2018.
- ATC capacity and ATC staffing contributed to 40% and 20% of total delay respectively. Weather issues contributed 33% of total delay.

Cost-efficiency:

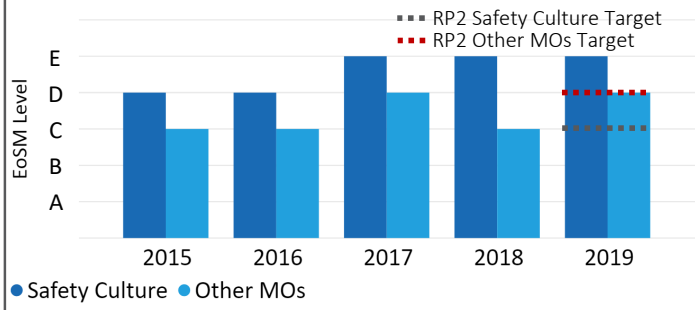
- Switzerland achieved the en route cost-efficiency target in 2019 with the actual unit cost (60.79€$_{2009}$) being lower than the determined unit cost (66.42€$_{2009}$). Switzerland achieved the en route cost-efficiency targets in each year of RP2, with the only exception of 2017.
- In 2019, en route actual costs were above the determined costs by +3.4%. The biggest variation against the plans is originated from 'other' operating costs (+15% more than planned). On the other hand, MET services costs decreased by -70%.
- In 2019, Switzerland overinvested +3M€$_{2009}$ in CAPEX (+21M€$_{2009}$ over RP2). Switzerland has implemented several changes with respect to its planned CAPEX and it is important for RP3 to prepare and provide a clear and stable plan in order to ensure transparency.

PRB Performance review body of the single european sky

Switzerland Factsheet

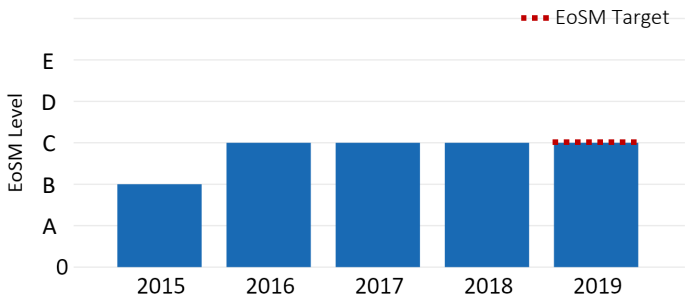
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



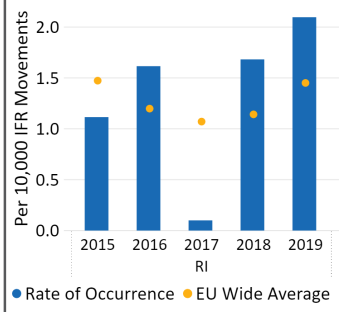
skyguide achieved the target level for safety culture since 2015 and for other Management Objectives in 2019.

State Effectiveness of Safety Management (EoSM) by Year

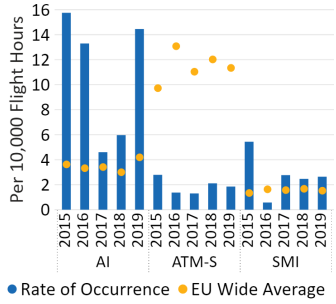


Switzerland has achieved the targets for the EoSM in all Management Objectives since 2016.

Runway Incursions (RIs) by Year

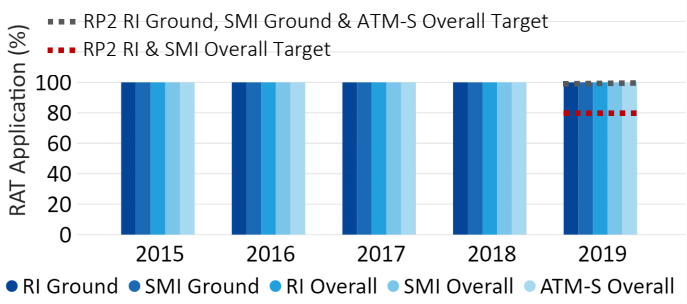


Occurrences by Type and Year



Between 2018 and 2019, RIs, AIs and SMIs have increased. In 2019 all rates except ATM-S' exceeds the Union-wide averages.

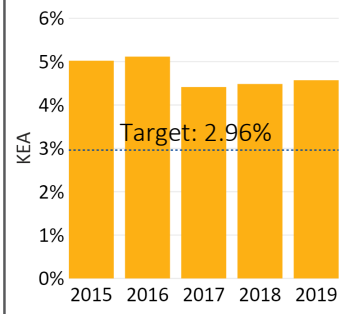
Risk Analysis Tool (RAT) Application to Severity Classification



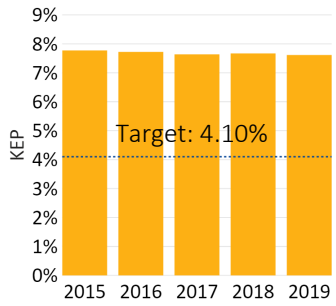
Switzerland and skyguide achieved the targets for the application of the RAT to severity classification since 2015.

Environment

RP2 KEA Performance

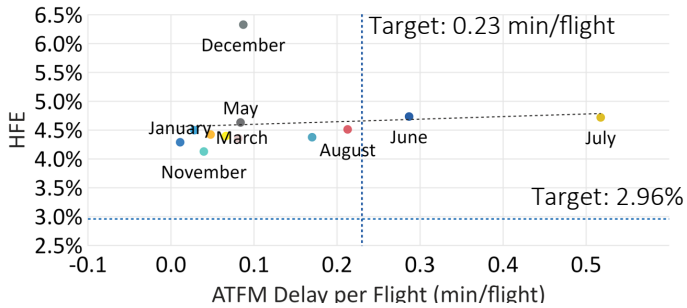


RP2 KEP Performance



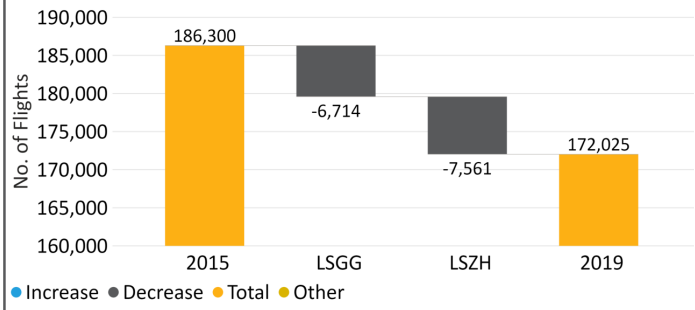
Switzerland did not contribute to the FAB KEA target or Union-wide KEP targets in any year of RP2.

ATFM Delay per Flight and HFE by Month in 2019



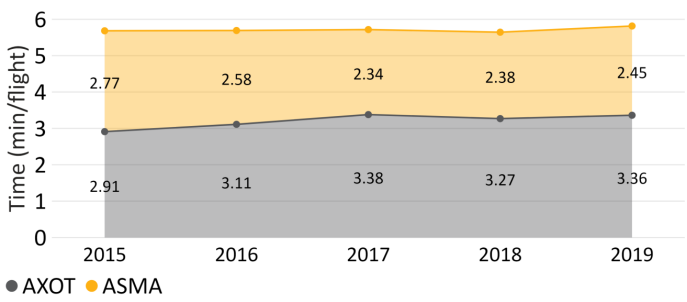
Each minute of additional en-route ATFM delay per flight correlated with a circa 0.5% increase in KEA.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations fell at regulated airports during RP2 by 14,275 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



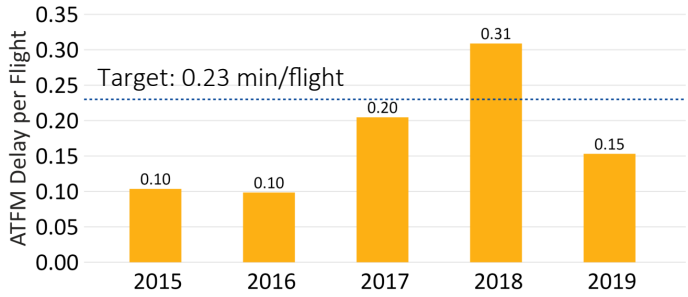
5.81 minutes of AXOT and ASMA was endured by airspace users in Switzerland (2/2 regulated airports reported data).

PRB Performance review body of the single european sky

Switzerland Factsheet

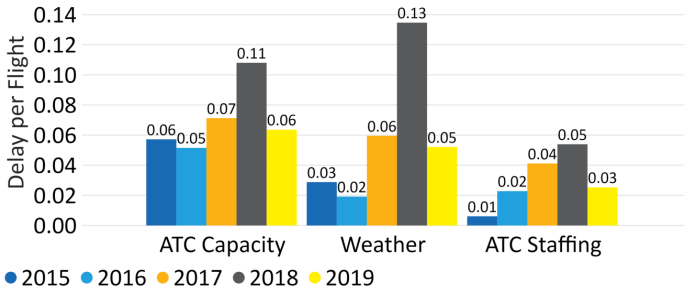
Capacity

ATFM Delay per Flight (min/flight)



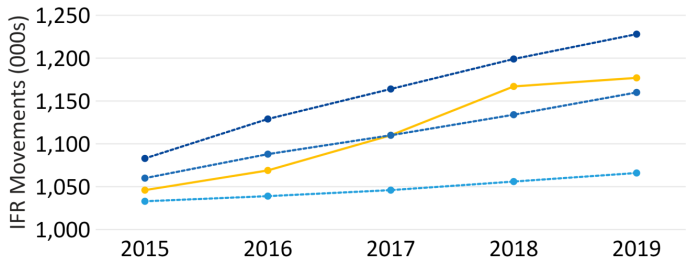
Delays in Switzerland decreased by 52% in 2019 compared to 2018. Switzerland achieved the targets in each year except 2018.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



ATC capacity, weather and staffing were the leading delay reasons contributing 40%, 33% and 20% of the delays respectively.

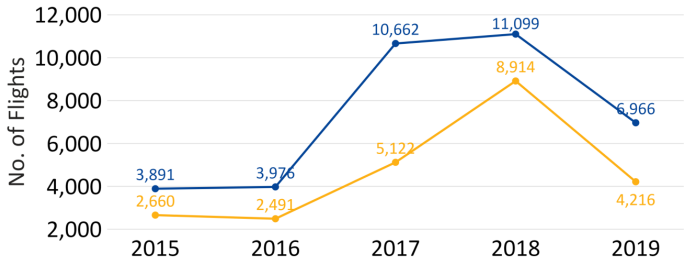
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were 1.5% above the STATFOR February 2014 base forecast and were below the high forecast.

Distribution of Delays (skyguide)

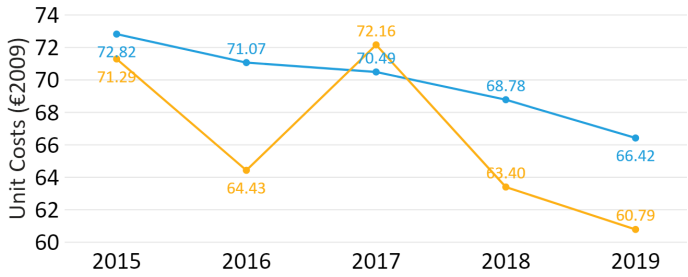


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

skyguide delayed 4,216 flights by more than 15 minutes in 2019, which was 38% of all delayed flights.

Cost-efficiency

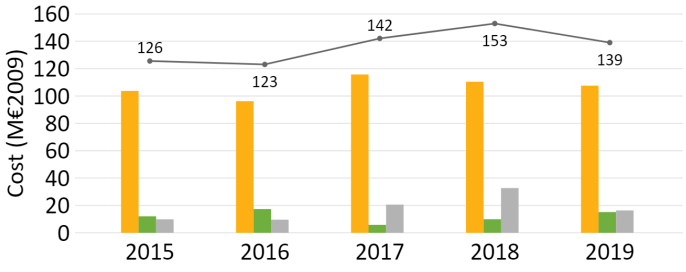
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower in each year of RP2 other than 2017. In 2019, actual unit costs were 8.5% lower than planned.

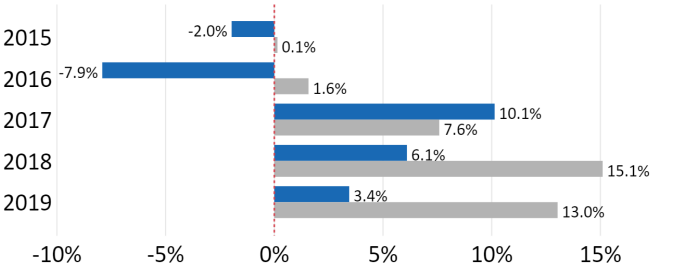
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in Switzerland decreased during 2019 (-9.2%).

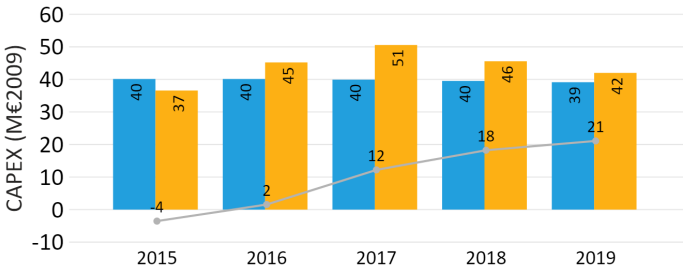
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Lower actual unit costs in 2019 were fuelled by higher service units.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

Switzerland spent 21M€ more than planned on CAPEX projects during RP2.

Comments from the Performance Review Body:

Safety:

- The United Kingdom achieved the target level for all Management Objectives since 2015.
- NATS achieved the target level for all Management Objectives since 2016.
- The United Kingdom achieved the targets for the application of the Risk Analysis Tool (RAT) to severity classification since 2015. NATS did fell short of the target for Runway Incursions (RI) ground in 2019 but achieved the targets in previous years.
- Over RP2, the rates of RIs and Airspace Infringements (AIs) worsen relative to 2015, exceeding the EU-wide averages in 2019. Separation Minima Infringements (SMIs) and Air Traffic Management Specific (ATM-S) improved slightly over RP2 and are below the Union-wide averages in 2019.

Environment:

- The United Kingdom did not contribute positively towards UK-Ireland FAB's actual or planned horizontal flight efficiency environment targets (KEA or KEP respectively) in any year of RP2.
- The NSA monitoring report claimed that the 3Di focus on en route vertical flight efficiency means that the holistic approach taken by NERL saved unnecessary emissions, despite not achieving the KEA targets.
- KEA and en route delays show a correlation of +0.4% per minute of delay in the United Kingdom, which suggests improving capacity could improve environmental performance.
- Terminal vertical flight efficiency improved as more flights completed fully continuous climb/descent at British airports in 2019 compared to 2015.
- On average, airspace users spent 9.42 additional minutes per flight taxiing out or in terminal airspace, which is a stable performance compared to previous years. Eight out of nine regulated British airports provided the data.

Capacity:

- The United Kingdom contributed positively towards UK-Ireland FAB's en route Air Traffic Flow Management (ATFM) delay per flight target by remaining below the national target in 2019.
- Average en route ATFM delay per flight was 0.21 minutes per flight in 2019, reducing from 0.28 minutes per flight in 2018.
- The number of instrument flight rules (IFR) movements in 2019 was 0.9% higher than in 2018 while the en route ATFM delay per flight decreased by 25%. The IFR movements remained above the STATFOR February 2014 high growth forecast for most of RP2, but the growth slowed down between 2018 to 2019 so the number of movements were below the high scenario.
- ATC staffing (38% of total delay), weather (29% of total delay) and ATC Capacity (19% of total delay) were identified as the main causes of delay.

Cost-efficiency:

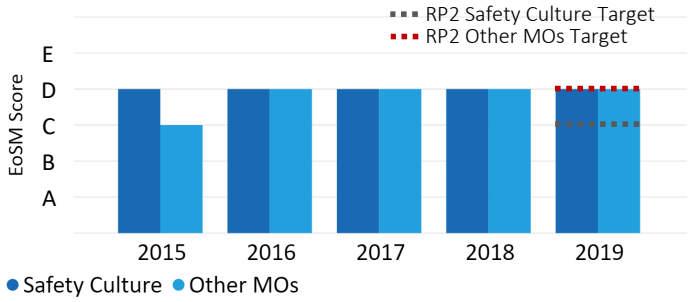
- The United Kingdom achieved the en route cost-efficiency target in 2019, with the actual unit cost (50.70€$_{2009}$) being lower than the determined unit cost (54.04€$_{2009}$). The United Kingdom achieved the en route cost-efficiency targets in each year of RP2.
- In 2019, en route actual costs were above the determined costs by +8%. The difference was mainly due to staff costs, which increased to cope with the higher traffic. Higher recruitment levels and project implementation costs were also incurred.
- In 2019, United Kingdom overinvested +40M€$_{2009}$ in CAPEX (+151M€$_{2009}$ over RP2). The majority of the deviation is due to the large +184M€$_{2009}$ overspending in the iTEC project.

PRB Performance review body of the single european sky

United Kingdom Factsheet

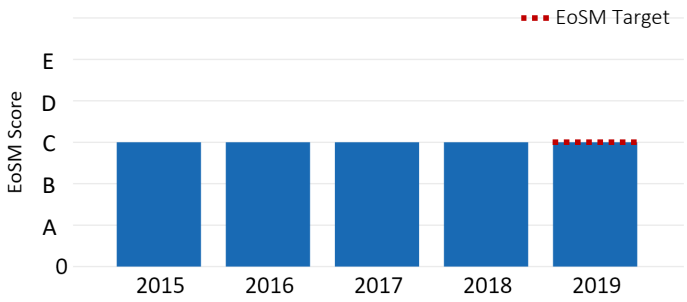
Safety

ANSP Effectiveness of Safety Management (EoSM) by Year



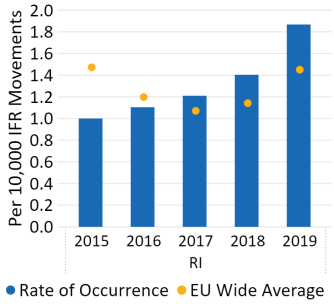
NATS achieved the target level for all Management Objectives since 2016.

State Effectiveness of Safety Management (EoSM) by Year

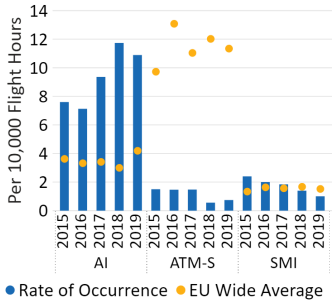


The United Kingdom achieved the targets for the EoSM in all areas since 2016.

Runway Incursions (RIs) by Year

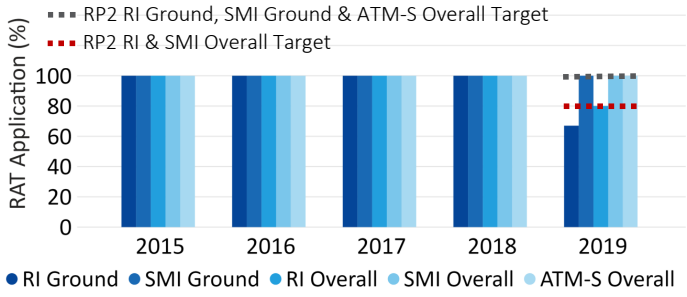


Occurrences by Type and Year



Rates of RIs and AIs increased relative to 2015 and exceeds the Union-wide averages in 2019.

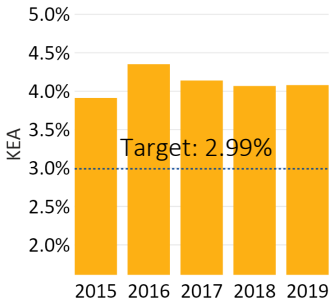
Risk Analysis Tool (RAT) Application to Severity Classification



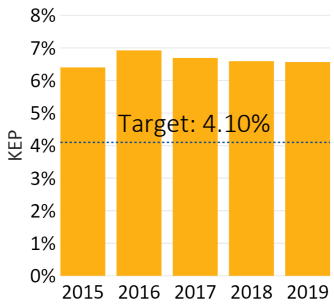
In 2019, the UK achieved the targets for the application of the RAT to severity classification. NATS did not.

Environment

RP2 KEA Performance

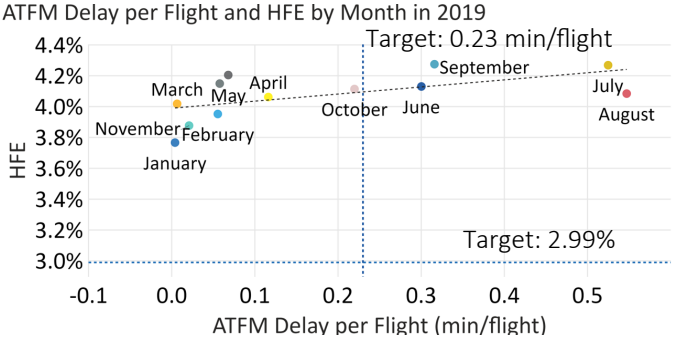


RP2 KEP Performance



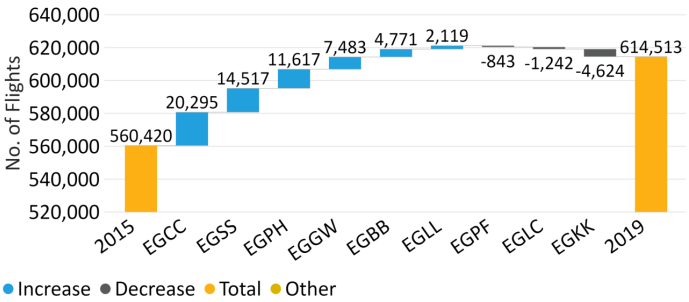
The UK did not contribute to the FAB KEA target or Union-wide KEP targets in any year of RP2.

ATFM Delay per Flight and HFE by Month in 2019



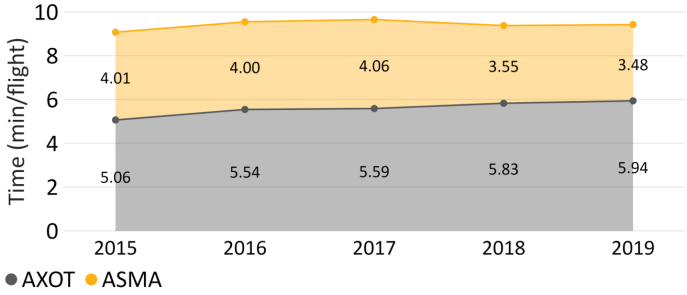
Each minute of additional en route ATFM delay per flight correlated with a circa 0.4% increase in KEA.

Number of Fully Continuous Descent/Climb Operated (CDO/CCO) Flights



The number of flights performing fully CCO & CDO operations increased at regulated airports during RP2 by 54,093 flights.

Additional Taxi Out Time (AXOT) and Holding Time (ASMA) by Year



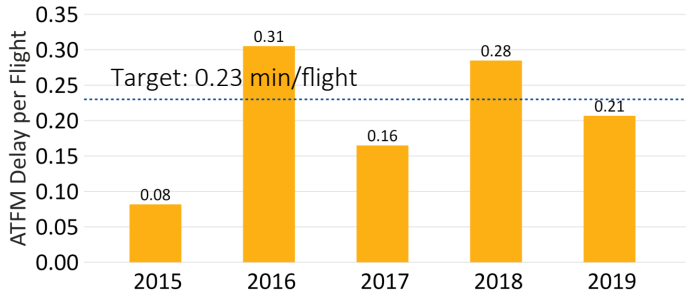
9.42 minutes of AXOT and ASMA was endured by airspace users in the UK (8/9 regulated airports reported all data).

PRB Performance review body of the single european sky

United Kingdom Factsheet

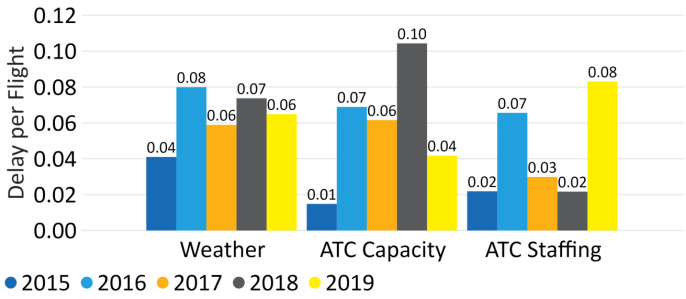
Capacity

ATFM Delay per Flight (min/flight)



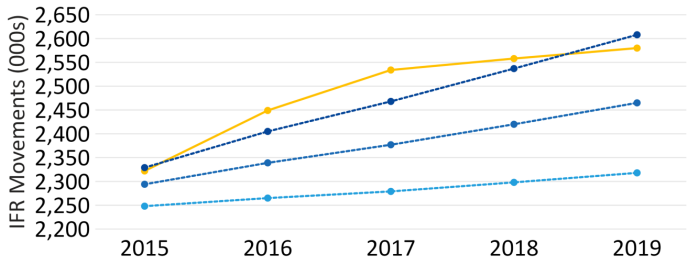
Delays in the UK decreased by 25% in 2019 compared to 2018. The 2019 capacity target was achieved.

Delay Codes Used for En-route ATFM Delay per Flight (min/flight)



Staffing, weather and ATC capacity were the leading delay reasons contributing 38%, 29% and 19% of the delays respectively.

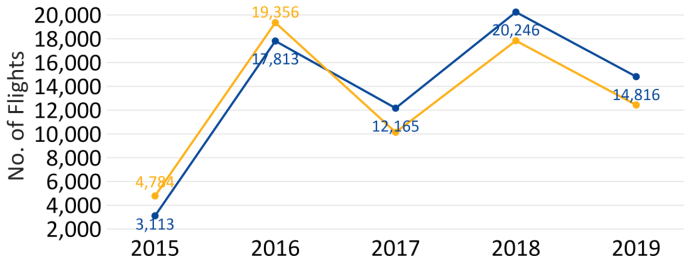
IFR Movements by Year and Forecast Type (STATFOR February 2014)



Forecast Type Actual Base High Low

IFR movements in 2019 were 1% below the STATFOR February 2014 high forecast.

Distribution of Delays (NATS)

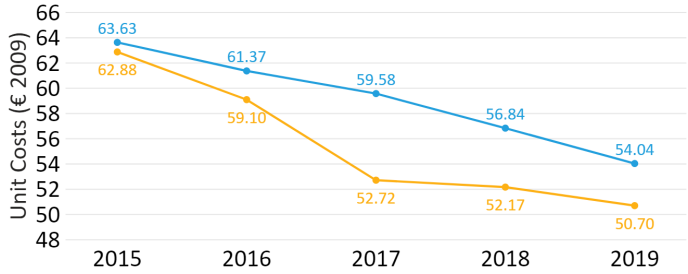


No. of Flights Delayed < 15 min No. of Flights Delayed > 15 min

NATS delayed 14,816 flights by less than 15 minutes in 2019, which was 54% of all delayed flights.

Cost-efficiency

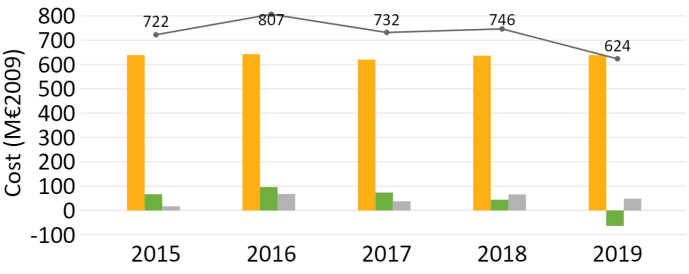
Determined and Actual Unit Costs by Year



1. Determined Unit Cost 2. Actual Unit Cost

Actual unit costs were lower in each year of RP2. In 2019, actual unit costs were 6.2% lower than planned.

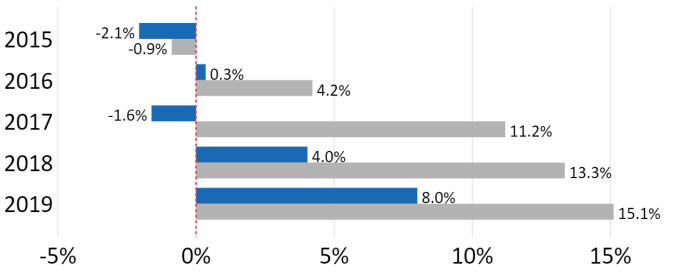
Total Economic Cost (TEC) and Cost Components by Year



1. Actual Cost 2. Net Gain from Charged Rate 3. Cost of Delay TEC

The year-on-year total economic cost for airspace users to use air navigation services in the UK decreased during 2019 (-16%).

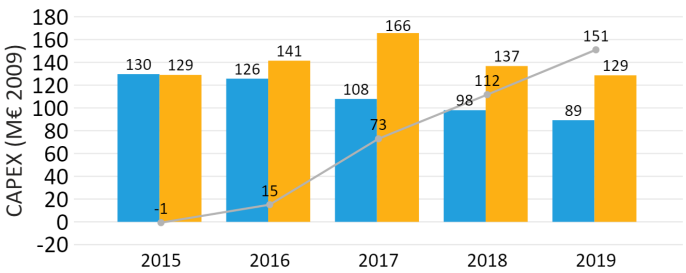
% Difference between Actual and Determined Costs and Service Units by Year



% Difference (AC vs. DC) % Difference (Actual SU vs. Determined SU)

Lower actual unit costs were fuelled by higher service units after 2015.

Determined and Actual CAPEX by Year with Cumulative Difference



1. Determined CAPEX 2. Actual CAPEX 3. Cumulative Under/Over CAPEX

The UK spent 151M€ more than planned on CAPEX projects during RP2.