IRISH AVIATION AUTHORITY

Annual Performance Report 2018

1. Chief Executive's Introduction

The IAA, throughout 2018, continued to deliver safe, efficient and cost-effective air navigation services in Irish controlled airspace and this report sets out our performance.

Competitive Efficiency: The IAA's competitive position remains amongst the very best in Europe, with charges to customers well below European average and high levels of operational performance, cost effectiveness and project delivery.

The IAA continues to be one of the most productive air navigation service providers in Europe; the en route customer charge for 2018 was €27.69, which is one of the lowest in Europe. The ACE Report published in 2019 showed that our gate-to gate financial cost effectiveness is significantly more efficient than the European average with very efficient unit costs.

Only 8% of the total ATFM delay recorded in 2018 can be considered as correctly attributable to the IAA as the ATM service provider. The remaining 92% was due to airport weather and runway capacity at Dublin. Exceptional weather and significant airport capacity issues were experienced in April and May 2018.

Air Traffic Management: There were approximately 1.15m flights successfully handled by the IAA in 2018 following a decade of sustained growth.

The ATM Operations and Technology Directorates of the IAA delivered a safe, efficient and reliable service to our airline customers in 2018. We met, and exceeded, the targets of the EU Performance Scheme for environment and capacity. Airport slot adherence statistics continue to demonstrate a performance level above the EU standard. During the year, we delivered a number of key projects, which are set out in detail within this report.

A key enabler of our operations strategy continues to be our air traffic management system (COOPANS). The COOPANS alliance is an international partnership between the air navigation service providers of Ireland, Austria, Croatia, Denmark, Portugal and Sweden with Thales as the chosen industry supplier.

The partners operate a fully harmonised, world-class, safe and cost-effective air traffic management system and as COOPANS goes from strength to strength, it continues to evolve with a sustained focus on maintaining and improving the system's resilience.

Innovation: The IAA has made significant progress in 2018 on the new visual control tower at Dublin Airport. The visual control tower is now the country's tallest occupied structure at almost 88m high and is a commanding new addition to the city's skyline. It will be ready to facilitate parallel runway operations when the northern parallel runway is introduced at Dublin Airport.

We progressed the COOPANS system towards fully integrating space-based ADS-B data from Aireon, and preparations got underway for trials and evaluations utilising the data.

Cross Border Arrival Management procedures advanced with plans to extend to Gatwick in 2019. This innovative cross border initiative, known as XMAN, involves collaboration between the IAA and neighbouring ANSPs and has demonstrated multiple benefits, including a saving in fuel and CO2 emissions.

Strategic Alliances: The IAA continues to benefit from strategic partnerships and alliances and we regularly cooperate with other ANSPs such as UK NATS and Iceland Isavia on a daily basis through both formal and informal structures.

IAA continues to be a shareholder in Aireon LLC, a US company developing space based global air traffic surveillance systems using ADS-B. We prepared for the launch of Aireon ALERT a global Aircraft Location and Emergency Response Tracking Service. This real-time emergency location service, known as Aireon ALERT, is the first of its kind and is provided free of charge.

The IAA continues to co-operate effectively EPNI delivers cost-effective ATM operational training using proven Scandinavian training methodology and philosophy. EPNI currently conducts training at two locations, IAA ATC Shannon and IAA ATC Dublin. On average, over 1,200 student weeks are delivered to IAA staff annually. This involves up to 200 high quality training programmes covering all aspects of ATC training requirements.

The IAA continued to cooperate effectively with the UK ANSP (NATS) through the UK-Ireland FAB (Functional Airspace Block) in what was the final year of the approved FAB Performance Plan for RP2 in which Ireland met all of its targets.

The IAA, through the COOPANS Alliance, is a member of SESAR (Single European Sky Air Traffic Management Research and Development) Deployment Alliance. This alliance has taken on the SESAR Deployment Manager role to develop and maintain SESAR Deployment Programme to modernise European airspace.

The IAA continues to play a key role through Borealis in the roll out of Free Route Airspace (FRA), which is one of the top priorities for airspace users within Europe and will mark a major step towards the Single European Sky (SES). The main beneficiaries of implementing FRA in airspace controlled by the Borealis Alliance will be the airspace users. Shorter routes will lead to lower fuel consumption and lower operating costs for the airlines, which will also reduce the impact of aviation on the environment.

Human Resources: Employee wellbeing remained a priority in 2018 with number of wellbeing initiatives made available to staff through our iHealth Positive matters employee wellbeing programme.

The industrial relations environment remained stable thanks to the development of the IMPACT Collective Agreement (2015-2019). This collective agreement records revised terms and conditions of employment for new entrants to the grades of air traffic controller, radio officer, airworthiness and flight operations inspectors.

Preparations got underway to agree a new Collective Labour Agreement and the IAA has also been preparing a funding proposal for the Main Pension Plan to meet a funding deficit.

Customer Consultation: The IAA continues to regularly communicate and consult with our customers. Our Customer Care Programme is essential in communicating key IAA message to our customers and on the other end, receiving detailed feedback from the customers on the service provided by the IAA ATM Operations. The IAA received an overall customer satisfaction of 92.5% in 2018.

A customer action plan, based on the comments received as part of the survey, was followed up in 2019 and the responses from a subsequent survey are being assessed.
Brexit: Brexit remained high on our agenda in 2019 and arrangements were put in place for continued UK-Ireland ATM cooperation. The UK Civil Aviation Authority (CAA) confirmed that the UK will continue to recognise all EASA base certificates for up to 2 years post Brexit. We have been reassured that ICAO rules will continue to be applied to overflights. Consequently, the IAA does not envisage an adverse impact to its Air Traffic Control (ATC) operations when the UK withdraws from the EU, irrespective of the form Brexit takes in 2020 or beyond.

I would like to thank all of my colleagues in the IAA for the important role they have played in delivering another successful year for the IAA, which has been demonstrated in many achievements accomplished in 2018.

Peter Kearney,
Chief Executive

2. Introduction

The Irish Aviation Authority has a regulatory requirement to produce an Annual Report on its performance.

The regulations provide, inter alia, that *"Air Navigation Services and Air Traffic Flow Management providers shall cover [certain] provisions on the level of quality of service..."*. Accordingly, the provision of air navigation services within the European Union shall be subject to certification by Member States that they meet the *common requirements laid down in Commission Regulation (EC) 373/2017*. This imposes an obligation on individual States to certify providers that comply with the common requirements and to subsequently designate air navigation service providers (ANSPs).

Responsibility for the certification process rests with the Safety Regulation Division (SRD) of the IAA. The designation process is a matter for the State but in order to be considered for designation, an entity must have prior certification.

2.1 Annual Performance Report

The *Annual Performance Report* shall include as a minimum:

- an assessment of the level and quality of service generated and of the level of safety provided;
- the actual performance of the service provider, compared to the performance objectives and indicators established in the Business Plan;
- developments in operations and infrastructure;
- the financial results, if they are not separately published in accordance with article 12(1) of the Service Provision Regulation;
- Information about the formal consultation process with the users of its services, and about the human resources policy.

This publication covers the period from *1 January 2018 to 31 December 2018* and is designed to meet the common requirements laid down in Commission Regulation (EC) No 448/2014 to *"provide a description of progress achieved in relation to the business plan, reconciling actual performance for 2018 against planned performance in the IAA's five year Corporate Plan 2018 -2022"*.

The IAA provided forecasts in its five year Corporate Plan 2016-2020 in the following areas.

- Safety
- Efficiency
- Cost effectiveness
- Capacity

A detailed analysis of actual performance versus planned performance under each of these areas is set out under section 2 to section 12 of this report.

3. Efficiency

3.1 Corporate ATM Safety Strategy

The IAA uses EUROCONTROL STATFOR forecasts[3], along with local economic knowledge, to forecast its traffic growth. The September 2017 forecast estimated a growth of total IFR traffic for Europe of +2.6% for 2018, and +3.8% for Ireland. This forecast was based on Ireland having very strong overflights from North Atlantic flows and also the increase of the flows from UK and Northern Europe to the Iberian Peninsula and Canary Islands.

Overall, 2018 was another very positive year for Irish air traffic and busiest yet in terms of number of flights handled by the IAA which rose to 1.15 million. Overall growth reported for Ireland was +1.4%, compared to 2017. Following very strong levels of traffic growth in the past number of years, similar growth is expected in 2019.

- Ireland's en route traffic (flights that pass through Irish airspace but don't land) increased by +1.4% to 345,403 movements.
- The IAA's North Atlantic Communications service, based in Ballygirreen in Co. Clare, saw a +0.9% increase in traffic during 2018.
- On the terminal side, commercial traffic grew by +4.7% in 2018 at the three State airports, with a total of 266,917 movements:
- Dublin Airport's commercial traffic grew by +4.8%;
- Shannon Airport's commercial traffic grew by+4.2%;
- Cork Airport's commercial traffic grew by +3.8%.

During 2018, arrival ATFM delays in Ireland have significantly increased with respect to the previous year (2017: 0.08 min/arr, 2018: 0.23 min/arr). The delays at Dublin are attributed mainly to aerodrome capacity (48%) and weather (47%).

As the Irish economy grows, the IAA will continue to support the airlines, the airports and the travelling public, through the provision of safe, costefficient, and industry leading air traffic services in the years ahead.

There were however increasing challenges at Dublin Airport, where the strong growth levels experienced since 2015 continued into 2018. Dublin handled total of 223,201 movements in 2018, which was +4.5% on the 2017 levels. This continued to place pressure on airport infrastructure, leading to congestion at peak times. The IAA ATM Operations Team at Dublin ATC had previously rolled out number of initiatives, including reducing departure intervals to 1.0NM, following successful operational trials.

3.2 RP2 Key Safety Performance Indicators (SKPI)

The IAA is continuously developing safety performance indicators for all aspects of the ATM system in line with the regulatory requirements of ICAO, and EASA, and also CANSO and EUROCONTROL recommended best practices.

The IAA ANSP is measuring, monitoring and reporting on the three leading SKPIs as required by EC Regulation 390/2013,

3 https://www.eurocontrol.int/archive_download/all/node/10415

which have been monitored since 2012 and measured since 2014 at European, National and FAB levels. These are: Effectiveness of Safety Management (EoSM): the safety maturity survey methodology was originally developed and conducted by EUROCONTROL and CANSO. This survey has been adopted by EASA as a SKPI Measurement since 2013.

Both EASA EoSM and Just culture, and Eurocontrol/CANSO Standard of Excellence (SoE) Surveys are completed by the Safety Management Unit (SMU) annually.

The IAA ANSP scored 92% in the 2018 EASA survey measurement, which places the ANSP's performance in top 5 out of 31 states. The performance remains significantly above the SES average of 83%.

IAA ANSP EASA EoSM Annual (Effectiveness of Safety Management) Survey		
2014	81%	-
2015	84% Management Objectives Level '4'	SES ANSP Average 79%
2016	92% Management Objectives Level '4'	SES ANSP Average 80%
2017	91% Management Objectives Level '4'	SES ANSP Average 82%
2018	92% Management Objectives Level '4'	SES ANSP Average 83%

CANSO / Eurocontrol.

The outcome from this Standard of Excellence (SoE), a separate but equivalent process to the EoSM, supports the EASA measurement, highlighting a continuous year on year improvement. Ireland scores very highly for its Safety Maturity performance as an Air Navigation Service Provider, maintaining in 2018 its ranking of first out of 47 states in the EUROCONTROL CANSO Global SMS Standard of Excellence Measurement. It should be noted that this measurement underwent a comprehensive re-development to ensure it is compliant with ICAO Annex 19 while also addressing feedback received from ANSPs, other industry bodies and evolving safety management thinking and practice. As a consequence, the score results of the CANSO SOE Questionnaire should only be compared from 2016.

The performance achieved in these demanding measurements is indiciative of our ongoing focused efforts and commitment to and drive for continuous improvement. These achievements are supported by our commitment to providing the resources necessary, to at a minimum maintain, and where possible to improve our performances in an enviroment of evolving regulation and its associated expanded scope and demands.

Risk Assessment Tool (RAT) methodology

Application of the RAT severity classification scheme.

The RAT is already applied to 100% of Separation Minima Infringements and Runway Incursion occurrence events, (exceeding the RP 2 requirement of 80% application by 2019). In 2018, the same level was achieved for ATM Specific Occurrences.

Just Culture Implementation

The process is now fully embedded in the IAA's practices, utilised by the investigation process when required and is supported by all Staff Associations /Unions. The IAA ANSPs Just Culture policy and process was assessed as 'Optimised Best Practice' (Level 'E') in the CANSO/Eurocontrol SoE maturity measurement in 2016, 2017 and 2018.

The proposed RP3 Safety KPI for certified air navigation service providers is the revised EoSM. This KPI measures the level of implementation of the following safety management objectives:

- safety policy and objectives;
- safety risk management;
- safety assurance;
- safety promotion;
- safety culture.

The revised version will, as currently framed, pose significant additional challenges to services providers in the context of maintaining their current levels of maturity.

Operational Safety Management

The IAA's ATM Safety Management Unit (SMU) is ensuring that, in collaboration with local managers, appropriate safety performance improvement plans are being developed and implemented, as follows:

The IAA safety management system (SMS) utilises the Unit Safety Manager (USM) function to ensure continuous SMS progression and development, so as to maintain our current high levels of Safety Maturity for the ANSP and for providing the ongoing capability to meet RP 2 safety requirements. The USM function, since its inception in 2013, and the transfer of responsibilities for Safety Investigation and Safety Performance to the SMU in 2015 have been significant contributory factors in the steady year on year measured safety maturity improvement. The USM function leads the SMS activities and development implementation on behalf of the GMs. In addition to this, the USM function is now supported by the introduction of ATCO Team Safety Reps, a voluntary role that has seen a positive uptake. The Safety Management Unit continues to provide expert advice, support, guidance and training, so as to ensure the USMs and Team Safety representatives attain and maintain the qualification levels necessary, meet new regulatory requirements and to provide the essential Safety Management support to the General Managers of the IAA's Enroute and Terminal Business Units.

'Human factors' is an increasingly important area of human performance analysis when considering ATM safety performance. Consequently, the Corporate Plan's objective for the creation of a new HF Expert role in the SMU has been approved, signifying the importance that we attach to this critical area and function. The function was formally established in January 2019, providing in-house expert competency supporting the Operational units with an increased level of specialisation and expertise, working in support of the local HF actors at the unit level. This development enables ANSP compliance with a range of additional the HF specific elements in EU 2017-373 regulation that is applicable form Jan 2020.

Safety Achievement Metrics

Safety data produced from the Occurrence investigation and Reporting system - TOKAI (Tool Kit for ATM Occurrence Investigation), introduced in May 2018 and integrated with our Business Intelligence (BI) tool, enables real time analysis of our Safety Performance. The SMU implemented a Safety Data Analyst function in 2016 with the employment of a specialist analyst, enabling continuous monitoring and the provision of detailed analysis of the ATM system performance. The trends are analysed and reported on Monthly and in the Quarterly Safety Performance Reports (SPR), utilising BI safety performance interactive dashboards. These published reports are the outputs of the integrated Business Intelligence platform, which provides real time and interactive safety performance dashboards, available to operational management. The quarterly reports

are consolidated in the National 2018 Annual Safety Performance Report. This integration of our Safety Intelligence tools is a CANSO (Civil Aviation Navigation Services Organisation) recognised Optimised Best Practice in the industry.

At the strategic level, the Organisational ATM Safety Committee (OASC) reviews the Safety Performance outputs from the above processes, providing direction, approval of enhancement actions and the resources necessary for implementation.

The SPR reports review our reporting levels, measurement and analysis of the ATM Specific Occurrences (Technical Events) and the Safety Performance Indicators (SPIs) for:

- Separation minima infringement
- Runway incursions
- Unauthorised penetration of airspace
- Deviation from ATC clearance
- Level bust

The IAA service provider's proactive involvement in theLocal Runway Safety Action Teams and AOPGs (Airport Operational Planning Groups - Dublin, Cork and Shannon) provide the platform for continuous monitoring and collective improvement actions for local safety performance. The runway protection measures provided in Dublin by A-SMGCS Level 2 enable continuous and effective multi stakeholder monitoring and analysis. ATM contribution overall remains low, however, there is ongoing dialogue with aircraft operators through the Stakeholder Safety Forum (SSF) to highlight all issues and, Level Busts and Deviation from ATC Clearance events in particular. Some benefits regarding reductions in individual airline contributions to these particular events was noted again 2018, however the efforts are ongoing through the SSF (Stakeholder Safety Forum) and Customer Care programme to further reduce these events type rates by all airlines.

IAA ANSP CANSO/ Eurocontrol Standard of Excellence/ Overall maturity score		
2014	78.0%	-
2015	86.5%	CANSO/ ECTL Average 67%
2016*	80.7%	CANSO/ ECTL Average 66%
2017	77.5%	CANSO/ ECTL Average 62%
2018	77.05%	CANSO/ ECTL Average 69.3%

* Note: scores from 2016 are not comparable to previous years scores due to the change in methodology used from 2016.

In 2018 the IAA achieved the highest score (77.05%) in the 2018 CANSO/EUROCONTROL safety management systems (SMS) standard of excellence (SOE) measurement.

The SMU manages and chairs the (SSF) an ANSP initiative implemented in 2016, with local and international Airline Operators, Airport Authorities and the Irish Air Corps participating. The SSF, as a minimum, meets annually and provides data to airlines on their performance in IAA's airspace biannually. This is a collaborative forum, for which the central activity is data sharing and Safety Performance reviews, contributing to the overall total aviation systems safety improvements in Irish airspace.

4. Efficiency

4.1 Traffic 2018

The IAA uses EUROCONTROL STATFOR forecasts[3], along with local economic knowledge, to forecast its traffic growth. The September 2017 forecast estimated a growth of total IFR traffic for Europe of +2.6% for 2018, and +3.8% for Ireland. This forecast was based on Ireland having very strong overflights from North Atlantic flows and also the increase of the flows from UK and Northern Europe to the Iberian Peninsula and Canary Islands.

Overall, 2018 was another very positive year for Irish air traffic and busiest yet in terms of number of flights handled by the IAA which rose to 1.15 million. Overall growth reported for Ireland was +1.4%, compared to 2017. Following very strong levels of traffic growth in the past number of years, similar growth is expected in 2019.

- Ireland's en route traffic (flights that pass through Irish airspace but don't land) increased by +1.4% to 345,403 movements.
- The IAA's North Atlantic Communications service, based in Ballygirreen in Co. Clare, saw a +0.9% increase in traffic during 2018.
- On the terminal side, commercial traffic grew by +4.7% in 2018 at the three State airports, with a total of 266,917 movements:
- Dublin Airport's commercial traffic grew by +4.8%;
- Shannon Airport's commercial traffic grew by+4.2%;
- Cork Airport's commercial traffic grew by +3.8%.

During 2018, arrival ATFM delays in Ireland have significantly increased with respect to the previous year (2017: 0.08 min/arr, 2018: 0.23 min/arr). The delays at Dublin are attributed mainly to aerodrome capacity (48%) and weather (47%).

As the Irish economy grows, the IAA will continue to support the airlines, the airports and the travelling public, through the provision of safe, costefficient, and industry leading air traffic services in the years ahead.

There were however increasing challenges at Dublin Airport, where the strong growth levels experienced since 2015 continued into 2018. Dublin handled total of 223,201 movements in 2018, which was +4.5% on the 2017 levels. This continued to place pressure on airport infrastructure, leading to congestion at peak times. The IAA ATM Operations Team at Dublin ATC had previously rolled out number of initiatives, including reducing departure intervals to 1.0NM, following successful operational trials.

4.2 Staffing

The total IAA staffing complement stood at 702 in 2018, up from 662 at the beginning of the year.

Manpower planning strategy continues to focus on maximising flexibility and productivity while ensuring cost efficient deployment of resources.

3 https://www.eurocontrol.int/archive_download/all/node/10415

4.3 HR

Employee Wellbeing

Employee wellbeing remained a priority in 2017 and a number of wellbeing initiatives, aimed at managing physical and mental health, were made available to staff through our 'iHealth Positive Matters' Employee Wellbeing Programme. In addition, the Authority marked National Wellbeing Day by hosting lunch time talks by AWARE on mental health awareness.

IR

The industrial relations architecture developed from the IMPACT/IAA Collective Agreement (2015 – 2019) has continued in 2018 to be effective in maintaining a stable industrial relations environment.

Pensions

The Funding Proposal for the main defined benefit pension plan ended 2018 in a surplus position. However, the pension plan does not satisfy the Funding Standard Risk Reserve which came into effect on 1 January 2019 requiring a new proposal to be agreed.

Training and Development

2018 was a busy year for training and development with many programmes made available to management and staff in the Authority.

There was a continuation of on-line training programmes covering data protection and cyber security.

Recruitment

Our operational staffing levels increased in 2018 and further increased are planned for 2019. Significant recruitment took place across the IAA with a total of 49 competitions. There was increased staffing in the areas of ATC, engineering and safety.

Health and Safety

The IAA was actively promoting the concept of employee wellbeing amongst its staff through various HR initiatives such as mental health awareness and training programmes.

The IAA received a Higher Distinction Award at the 2018 National Irish Safety Organisation awards. This is the third successive year in which the IAA has been recognised for its best practice approach to managing occupational health and safety.

4.4 Financial Results

The Authority does not propose to review its financial results in this report, as the financial results are separately published and independently audited in accordance with article 12(1) of the Service Provision Regulation. These can be accessed on the IAA's website www.iaa.ie.

5. Performance Comparison

The IAA's competitive position is amongst the very best in Europe, with well below average charges to customers and high levels of operational performance and project delivery.

The IAA's **competitive position** is amongst the **very best in Europe**, with well below average charges to customers and high levels of operational performance and project delivery.

Airport slot adherence statistics also demonstrateda performance level well above the EU standard.

In addition, the ATM Cost-Effectiveness (ACE) 2017 Benchmarking Report[4], published by EUROCONTROL, confirmed that, the IAA performs very well compared to our peers and the European average, as outlined in the table below.

Sustained levels of traffic growth coupled with constrained staffing levels have led to significant improvements in efficiency scores, however it is anticipated that these are likely to moderate in 2018.

- The economic cost-effectiveness indicator is used by the ACE report as an assessment of ANS performance, and is defined as gate-togate ATM/CNS provision costs plus the costs of ground ATFM delays, for both en-route and airport, all expressed per composite flighthour. This performance indicator is intended to capture any changes between ATC capacity and costs. For the IAA, the unit economic cost for 2017 was 6th lowest among 38 ANSPs with an actual value of €304,which is +2.4% higher than the 2016 figure (€297).Compared to the European average of €477, the IAA's unit economic cost was 56.9% lower in 2017.
- The financial cost-effectiveness indicator in the ACE Benchmarking Report is defined as the ATM/CNS provision costs per composite flight-hour. IAA had the lowest level

Summary - IAA vs European Average			
KPI	**European Average**	**IAA**	**Variance IAA vs. Eur Avg**
gate to gate ANS cost per composite flight hour (economics)	€477	€304	**-36.3%**
gate to gate ATM/CNS cost per composite flight hour (financial)	€401	€301	**-24.9%**
ATCO hour productivity	0.88	1.11	**26.1%**
ATCO employment costs per ATCO hour	€114	€98	**-14.0%**
support costs	€271	€213	**-21.4%**

Table ACE 2018 Summary: IAA vs European Average (Published in May 2020)

4 https://www.eurocontrol.int/ACE/ACE-Reports/ACE2018.pdf

of ATM/CNS provision costs within the COOPANS group of €301 per composite flight hour compared to a European average of €401. NAV Portugal subsequently joined COOPANS, and had a lower cost per composite flight hour at €258 in 2017.

- ATM/CNS provision costs within the COOPANS group of €301 per composite flight hour compared to a European average of €401. NAV Portugal subsequently joined COOPANS, and had a lower cost per composite flight hour at €258 in 2017.
- ATCO-hour productivity measures the efficiency with which an Air Navigation Service Provider (ANSP) deploys and makes use of its ATCOs. The IAA's air traffic controllers (ATCOs) productivity of 1.11 composite flight-hours per ATCO-hour in 2017 was approx. 26% higher than the European average of 0.88.
- ATCO employment costs indicator for 2017 showed the ATCO employment costs per ATCO-hour at pan-European level amounted to €114 in 2017, the same as the previous year. In comparison, IAA costs were €98 in 2017. Between 2014 and 2017, the IAA costs decreased from €103 to €98. ATCO employment costs over the 2014-2017 period have increased in general across the pan- European region, largely driven by sustained economic growth. IAA was one of the few ANSPs which has managed to buck this trend during 2014-2017.
- Support costs encompass a variety of cost items, including employment costs for non-ATCO in OPS staff, non-staff operating costs capital-related costs and exceptional costs. Despite an increase in IAA's support costs in 2017 from €208 to €213, this remained significantly below the European system average of €271 with Skyguide and Belgocontrol at €587 and €505 respectively. The support costs for IAA reached their peak in 2011 with a unit cost of €285, and in spite of recent pressures, the have decreasing since then (with an overall decrease of 25.2% between 2011 and 2017).

This ACE benchmarking analysis is based on information provided by 38 ANSPs to the Performance Review Commission (PRC), in compliance with Decision No. 88 of the Permanent Commission of EUROCONTROL.

6. Cost Effectiveness

The capacity of the IAA to deliver services to its customers in a cost-effective and sustainable manner is one of our key strategies, with the IAA continuing to contribute to a European reduction in en-route charges via the implementation of the UKIreland FAB Performance Plan for Reference Period 2 (2015 – 2019).

The IAA has been focusing on improving further, the **quality of its services**, while maintaining an eye towards the final costs for its customers

This plan was submitted by the Irish and UK Governments in Q4 2014 and adopted by the European Commission in Q1 2015.

6.1. En-route Charges

The IAA recovers the costs of en-route air navigation facilities and services by means of en-route charges. A charge is levied on airspace users for each flight made under Instrument Flight Rules taking into account the distance flown and the weight of the aircraft (service units).

The IAA establishes its determined en-route cost base for the year in which the charges are collected. This cost base comprises of operating costs plus depreciation plus interest on capital expenditure plus the State's share of EUROCONTROL costs. Ireland is a member of EUROCONTROL, the European organisation responsible for the safety of navigation and also responsible for helping to develop a coherent and co-ordinated air traffic management system in Europe.

The unit rate that is charged by the IAA is established by dividing the determined costs by the estimated traffic, measured in terms of service units, to give the en-route service unit rate. An adjustment mechanism is operated so any adjustments such as traffic risk sharing and inflation in a particular year are taken into account in determining the unit rate in future years. The unit rate is applicable from 1 January.

This system allows the IAA to recover only the determined costs, which have been approved by the NSA to provide the en-route service. The en-route rate charged to the IAA's customers in 2018 was €27.69, down from €29.54 the previous year. The submission to the NSA assumed chargeable en-route determined costs for 2018 of €129,364,400 and chargeable service units (CSUs) of 4,184,878. The actual outturn for 2018 was as follows:

Ireland En-Route Charges		
	en-route costs (Incl. MET)	chargeable service units
Actual outturn	€117,767,000	4,549,883
Forecast figure (NSA submission)	€129,364,400	4,184,878
Variance	-€11,597,400	+365,005

6.2Terminal Charges

The IAA recovers the costs of terminal navigation facilities and services by means of terminal charges.

These terminal charges are determined by the provisions of the European Commission Charging Regulation EU No.391/2013, operated through the EUROCONTROL bilateral system.

A charge is levied on users for approach, landing and take-off services provided at each of the State airports, Cork, Dublin and Shannon, taking into account the weight of the aircraft, where this weight exceeds two tonnes. The IAA's terminal cost base comprises of operating costs, plus depreciation, plus a regulatory return.

For 2018 and in accordance with EC regulations, the IAA's terminal service charge has been calculated as the maximum take-off weight divided by fifty to the power of 0.7. The terminal service unit rate for 2018 was €151.75. The actual outturn for 2018 was as follows:

Terminal Charges		
	Terminal costs (Incl. MET)	Terminal service units
Actual outturn	€24,245,000	182,711
forecast figure (NSA submission)	€27,424,700	152,900
variance	-€3,179,700	29,811

7. Capacity & Efficiency

The IAA as Air Navigation Service Provider is responsible for the provision of safe, efficient and reliable air traffic services which meet the needs of its customers in a cost-effective manner.

The IAA in delivering safe and efficient service provides the necessary airspace procedures to ensure sufficient capacity. These procedures are designed to ensure an efficient use of airspace for our airline customers. The following are examples of how we achieve this and meet our stakeholder requirements:

The IAA as Air Navigation Service Provider is responsible for the provision of safe, efficient and reliable air traffic services which meet the needs of its customers in a cost-effective manner.

- The IAA uses dynamic sectorisation within its free route airspace in Shannon ACC, in order to ensure capacity meets current and future demand. Sectors are made of building blocks, split horizontally and vertically and are constructed several times a day, ensuring the sectorisation is best suited to the traffic flows.
- An additional review of a number of these building blocks was carried out over the winter period 2017/2018. This review of Shannon En Route resulted in the realignment of the basic building blocks to reflect changes to flight profiles which resulted in increased capacity and simplified internal coordination. These changes were looked at, not only in the context of current traffic demands, but also looking ahead to changes on the North Atlantic to consider the increased complexity associated with the introduction of PBCS and space-based ADS-B trials. In addition, Shannon also increased Free Route Airspace availability reducing the base level from FL245 to FL75. Ireland now has one of the most efficient airspace designs in Europe and this is reflected in increased efficiency for airspace users. Finally, Shannon ACC expanded the use of Single Person Operations (SPO) delivery further capacity through enhanced ATCO flexibility.
- Commercial movements at Dublin Airport in 2018 amounted to 226,181, which equated to a 4.8% increase over 2017. With Dublin Airport's ground infrastructure remaining constrained and close or at full capacity, the increase was almost entirely made possible by operational enhancement measures developed and implemented by Dublin ATC. Because of techniques associated with High Intensity Runway Operations (HIRO), it will be possible to regularly achieve 45 movements per hour.
- Having completed live trials of remote and simultaneous provision of ATC services for Cork and Shannon Airports from its facility at Dublin ACC, plans have gotten underway to progress towards full introduction of remote towers.
- Electronic Flight Strips (EFS) and Departure Manager software were developed for Dublin Tower, as the IAA equipment contribution to the Airport Collaborative Decision Making

(A- CDM) project for Dublin Airport. A-CDM is an integral part of the EUROCONTROL Network Manager strategy and, for individual airports, aims to regularise punctuality, reduce taxiing times and limit ground fuel burn and environmental nuisance. Trials successfully took place in 2018 paving the way for Dublin's A-CDM to be fully integrated into the European Network.

8. Delays

Ireland continued to demonstrate excellent en route capacity performance in 2018 having achieved zero delay, which provided a positive contribution to network performance.

During 2018, arrival ATFM delays in Ireland have significantly increased with respect to the previous year (2017: 0.08 min/arr, 2018: 0.23 min/arr). The delays at Dublin are attributed mainly to aerodrome capacity (48%) and weather (47%).

9. Environment

The IAA is committed to minimising the environmental impact caused by the provision of air navigation services in Irish controlled airspace through implementation of the IAA environmental policy and the national operational environmental management plan (noemp).

In support of its Environmental Policy, which was reviewed in 2016, the IAA continued in 2018 to:

- Promote a strong ethos of Environmental Management in the aviation industry in Ireland.
- Ensure that in delivery of Air Navigation Services we consider the impact of aviation on the environment in the planning, design and revision of airspace and Air Traffic Control procedures.
- Consider environmental impact in the strategic decision-making processes.
- Comply with all legal requirements in relation to environmental impact on aviation.
- Seek to reduce the IAA's direct environmental footprint and minimise future adverse environmental impact through current and future initiatives.
- Monitor and review the implementation of this policy in line with the IAA's continuous improvement philosophy.
- Communicate this policy to all IAA staff and stakeholders.
- Provide IAA staff with an awareness of environmental management issues.

Separately, the National Operational Environmental Management Plan, developed in 2016 and revised biennially provides an overarching framework for environmental management of the ATM Operations & Strategy Directorate of the IAA, and sets out key commitments in terms of environmental management. The plan includes a number of notable initiatives:

- Ensuring that environmental targets set under the SES Performance Scheme are met. The key performance indicator in this area is for Horizontal En-Route Flight Efficiency. In 2018, IAA met its FAB RP2 target but owing to the NERL performance, the UK-Ireland FAB scored an actual performance of 3.63% whereas the target was a maximum of 3.09%.
- The minimal value of horizontal flight efficiency has been attributable to ENSURE (En-Route Shannon Upper Airspace Re- Design) Project, completed in 2009, which removed the airway structure from the upper section of en-route airspace, changing its nature to free route and the Shannon low level route structure removal which took place in 2017.
- Ireland now has the lowest (and most efficient) Free Route structure in Europe. It is hoped that the expansion of FRA into lower airspace will allow customers operating in the Irish airspace to file the most optimum trajectory available with a view to realising savings in the areas of fuel burn and CO2. This brings the airspace in line with upper airspace operations but also allows for more accurate and flexible flight plan filing by airspace users thus ensuring maximum flight efficiency.

- Continuing to implement and develop innovative procedures and technology, such as Point Merge, Continuous Descent Operations, Precision RNAV, and Enhanced Reduced Departure Intervals. These projects offer environmental benefits such as reductions in fuel burn, CO2 emissions and noise pollution.
- The IAA is required to demonstrate that the environmental impact of our activities is being considered, particularly during the planning phase and in this regard, a short section was added to all new business cases which demonstrate that the environmental impact of these projects has been considered and which records the expected benefits.

10. Developments In Operations Infrastructure

The primary objective of the IAA's Technology directorate is to develop and deliver the IAA's Technology strategy.

The IAA Technology Strategy is strategic document, reviewed on an annual basis, to ensure it continues to meet the IAA's operational requirements and obligations under the SES legislation. The current Technology Strategy covers the period 2017-2021.

The methodology used in compiling the IAA Technology Strategy is to:

- Identify the Communications, Navigation and Surveillance (CNS) goals we wish to achieve;
- Review the IAA's on-going commitment to implement SES legislation requirements;
- Plan for the migration of the IAA existing legacy Data Communications infrastructure to IP based networks;
- Identify which emerging technologies the IAA must monitor and evaluate in order to position the organisation for the challenges ahead.

All identified technology projects are subject to approval by the Air Traffic Management Planning Group (ATMG) to ensure that the proposed technology changes meet operational requirements. Projects are also subject to internal scrutiny from the CAPEX committee which approves business cases and tracks budgets against the actual spend.

Operational requirements are the primary driver for technology change and can be expressed as requirements to increase the system capacity, improve safety, improve performance or remain compatible with changing SES requirements. Building on progress made in 2017, the most significant developments in Operations and Infrastructure in 2018 were as follows;

COOPANS Development

The COOPANS system remains at the forefront of European ATM system developments. In 2017, the COOPANS partners went live with the COOPANS B3.2 software build followed by COOPANS B3.4 step 1 in May 2018, and planning is underway for the introduction of B3.4 step 2 in January 2019. B3.2 introduced CPDLC improvements for FANS and ATN flights allowing for display of free text messages, uplink of welcome messages, and improved CPDLC HMI. B3_4 contained improvements to the LOST LIST window, improvements to Topsky safety nets and improved parameters within the dataset which make it easier for Controllers when coordinating with the neighbouring ANSPs. The main operational benefit is improved display to the ATCO on the status of a FANS CPDLC connected flight plans, improved definition of safety nets leading to reduced spurious alerts and improved flexibility within the dataset allowing for more intelligent definition of certain conditions relating to profile, OLDI coordination etc. The COOPANS partners continue to revise the COOPANS roadmap to ensure it's compliant with the SESAR Deployment Program. The road map extends to 2025 and includes a migration to a Java Based HMI (Human Machine Interface) and the incorporation of the Flight Object interoperability requirements and a potential migration to CoFlight which is the next generation of FDP.

- **Remote Tower Operations Trials:** The IAA successfully demonstrated the use of remote tower technology in a multi tower environment in a SESAR trial in 2016. The trial involved the control of Shannon and Cork towers from Dublin. The IAA were the first in the world to demonstrate multiple airport Remote Control by a single Controller. The IAA are now planning to introduce Remote Tower Operations into service in Q4 2019 commencing with the provision of ATS using a Remote Tower for Shannon Airport.
- **XMAN Cross Border Arrivals Management:** IAA worked closely with NATS in the UK on a project to reduce aircraft holding times at Heathrow Airport since 2014. ATCOs in Ireland and other countries neighbouring the UK introduced procedures to slow down aircraft up to 350 miles away from London, minimising holding times on arrival. Following successful trails, the full permanent XMAN was implemented and permanent procedure put in place by IAA in 2017. The Technology Domain ensured that COOPANS was adapted to process the XMAN data to seamlessly display the speed reduction data on the Controller label in Shannon thus minimising the workload increase on the Shannon ATCOs.

In addition, the IAA progressed a number of technology projects:

- The new CEROC (Contingency En Route Operations Centre): following the building handover to the Technology Domain in late 2015, the system installation is ongoing and the building is due for handover to Operations Domain for use as the new contingency centre for en-route operations in 2019. The site acceptance tests for the COOPANS platform and the Radio Backup System (RBS) have been completed. Installation of the main VCCS system is currently ongoing.
- The IAA have taken the strategic decision to use the new contingency centre as the opportunity to test and validate the use of IP based data networks for all communications including air-ground voice. This is a far- reaching strategic decision and has implications for the IAA's data communication infrastructure. Currently the IAA is working to upgrade its data communications facilities at all remote sites. This approach is similar to the approach taken by other Europeans ANSPs where the use of VOIP is validated for contingency use before progressing to deployment on all operational platforms. As the full migration to IP networks is a critical element of the SESAR Deployment Plan, the IAA has successfully obtained funding from the EC Innovation and Networks Executive Agency (INEA) for this activity.
- **Electronic Flight Strips (EFS):** In May 2017 Electronic Flight Strips replaced the paper strips system that had been in use in Dublin Tower since the very first aircraft was controlled at Dublin Airport. The EFS system assists the IAA and Dublin Air Traffic Control in managing airborne and surface air traffic in a more efficient manner with enhanced safety features. The EFS system will also be used by Shannon Tower Controllers when Shannon is transitioned to Remote Tower in Q4 2019.
- **New Visual Control Tower at Dublin Airport:** in 2017, IAA commenced construction work on the new air traffic control tower at Dublin Airport. The new tower will be 86.9m high enabling full visibility of the manoeuvring area of both runways, an essential ICAO requirement. The tower will also be supported by a single story over basement building of approximately 900 square meters. The construction phase is due to be completed in 2019, at which stage the systems' installation will commence to ensure that the new tower is fully equipped with all of the required modern communications, surveillance and navigation equipment by 2020. The plans are designed specifically to meet the needs of the new parallel runway at Dublin Airport, planned by the daa.

11. Innovation In Operations and Infrastructure

Aireon

The IAA is a partner in Aireon LLC; a $400 million cutting edge technological partnership between Iridium Communications (USA) and a number of air navigation service providers – NATS (UK), NAV CANADA (Canada), ENAV (Italy) and Naviair (Denmark).

Aireon provides a service to Air Traffic Controllers to identify and separate aircraft in real time vi ADS-B, which is an air traffic surveillance technology that relies on aircraft broadcasting their identity, a precise Global Positioning System (GPS) position and other information derived from on-board systems. The data is broadcast every half a second from the aircraft.

Space-based ADS-B provides full, continuous, global air traffic surveillance, whereas before, 70 percent of the world had no access to ATS surveillance information (i.e. the oceans, polar regions, mountainous regions, jungles, deserts). Space-based ADS-B significantly improves Air Traffic Management (ATM) safety, efficiency, predictability and capacity, while reducing overall infrastructure costs.

Although ADS-B is an established technology, that is already widely used, the availability of global surveillance will have a transformative effect on ATC. It represents an opportunity for the IAA to provide ATC surveillance services beyond 15 degrees West, which is the cut off point for terrestrial RADAR coverage. When available, this would facilitate the early streaming and sequencing of the east-bound traffic flow into European airports. For west bound traffic flows it will offer the potential of flight level changes that are not possible in procedural airspace. The ICAO SASP has agreed the separation standards and it is expected that these will be published as a global standard in 2020. In the interim, ICAO have approved a trial of SB ADS-B separations on the NAT and the trial is expected to commence in 2019.

Utilising data from Aireon

This development represents a major opportunity for the IAA to review its sphere of influence in particular on the North Atlantic. SB ADS-B has been integrated into the the ARTAS tracker and COOPANS system at CEROC and is currently being evaluated.

Aireon have been working with EASA to ensure EU certification prior to the constellation becoming operational in 2019. The AIREON Data for the IAA will be site accepted on March 8th 2019 and EASA are expected to certify the data for use thereafter. The IAA will then commence pre commissioning final testing to enable the data to be used by Shannon en-route Operations.

Aireon ALERT

The Aireon Aircraft Locating and Emergency Response Tracking system, known as Aireon ALERT, will be the aviation industry's only free, global, emergency aircraft location service. Aireon ALERT will provide air traffic control organisations, commercial aircraft operators, regulators, accident investigators and

search and rescue organisations to access, on request, the exact position data for an aircraft in distress or in an emergency situation anywhere in the world.

Beginning in 2013 the Aireon and IAA teams partnered to bring this essential public service to the industry. Pre-registration started in August 2018.

Aireon ALERT is the result of collaboration between the Irish Aviation Authority (IAA), who will provide the service, free of charge, from their North Atlantic Communications Centre in Ballygirreen, County Clare, Ireland, and Aireon, who provides the data.

Born out of a moral obligation to share space-based ADS-B data with aviation stakeholders who need it most in a crisis situation, Aireon ALERT will ensure critical data is delivered to the appropriate authority in a timely and responsible manner.

Tower Innovations

Electronic Flight Strips (EFS) is currently operational in Dublin Tower. The installation of EFS in Cork and Shannon towers will enable a standardisation of tower procedures across all three towers.

Centralised Monitoring

Virtual Technical Desk

The installation of centralized monitoring for all operational systems in Shannon, Dublin, Cork and Ballygirreen is ongoing. This is an innovative technology that will enable enhanced monitoring of all IAA operational systems.

CEROC

Preparations continues for the IAA's new En route Contingency En route Overflow Centre (CEROC) which will be based entirely on IP technologies. This will provide for improved resilience with a high level of back-up to the Shannon ACC thereby minimising disruption to our customers should a contingency situation occur.

New Dublin ATC Tower

The daa commenced build of a parallel runway at Dublin airport to meet growing demand and counter current congestion issues.
The development of the parallel runway has necessitated the IAA to build a new visual control tower and associated infrastructure in order to "release" the capacity of the new runway. The delivery of the IAA's new Visual Control Tower at Dublin Airport is an essential enabler for the proposed parallel runway. Building works on the Tower made significant progress during 2018 with construction expected to complete in early 2019 before the Technology fit out commences.

COOPANS

COOPANS is a well-recognised, successful partnership, for procurement of ATM systems amongst 6 ANSP's (IAA, LFV, NAVIAIR, AUSTROCONTROL, CROATIA CONTROL, NAV PORTUGAL).

On September 18 at Eurocontrol HQ in Brussels, final documents were signed to officially make Portuguese Air Navigation Service Provider NAV Portugal the sixth member of the COOPANS Alliance.

The COOPANS ATM system delivers cost efficiency, safety, capacity and environmental performance benefits. COOPANS is currently at a point of ATM system stability. Operational staff believe the system to be working well, with harmonised software across all centres. As a group, the COOPANS ANSPs are comparable to one of the EU 'Big 5' ANSP's in terms of 'control' and capacity, have low costs and are efficient compared with other ANSPs.

COOPANs has been in the early stages of planning for the next generation systems, which will replace our existing FDP. In order to increase system capacity as well as meeting new European regulatory requirements, this will require significant investment over the next decade from all the COOPANS partners and will deliver incremental improvement of safety, efficiency, resilience and capacity. Examples of planned improvements include; Time Based Separation will deliver increased runway capacity, whereas enhanced data linking will increase ATCO productivity via better automation of routine tasks.

En Route Services

The IAA successfully extended Shannon's Free Route Airspace (FRA) into the Lower airspace, building on the success of FRA which has been operational since 2009 in Upper airspace. This expansion of FRA allowed airspace users operating in the Lower airspace to file the most optimum trajectory available with a view to realising savings in the areas of fuel burn and thereby reducing CO2 emissions.

Irish controlled airspace acts as a gateway between Europe and North America, with the IAA's Area Control Centre in Shannon handling over 90% of all air traffic on the North Atlantic. Successive reductions in longitudinal and lateral separation minima on the North Atlantic were implemented during RP2 by NATS and Nav Canada with the active participation of the IAA as the main European interface. Reduced Lateral Separation Minima (RLat SM) and Performance Based Communications & Surveillance (PBCS) were implemented and an operational trial of Advanced Surveillance Enhanced Procedural Separation (ASEPS) has commenced and is ongoing.

In Irish controlled airspace, the IAA expanded the 5NM minimum radar separation area to include the entire airspace from FL290 and above. This change further improved airspace efficiency and was necessary for the implementation of ASEPS.

Extended cross border arrival management (XMAN) was also implemented for the peak transatlantic eastbound arrivals into London Heathrow in collaboration with UK NATS. This helps to reduce aircraft holding at Heathrow with associated reductions in fuel burn and CO2 emissions.

Controller efficiency and productivity has been improved by the phased implementation of Single Person Operations (SPO) in Shannon ACC Upper and Lower sectors.


BAILEY ATTA

12. Customer Consultation Process

Our customer care programme is a key tool for communicating key IAA messages to our Airline customers and is a mechanism for them to provide detailed feedback, in face to face meetings and through an independently administered online survey. This gives our people a greater understanding of what our customers think of us and of what kind of ATM services they want us to deliver. It fulfils the ANSP's consultation obligations under commission Implementing Regulation (EU) no. 1035/2011. Each year, we meet with a representative sample of our Customers (35 in 2018) across Europe, North America and the Middle East, the most important markets for the IAA. These airlines cover all the major passenger and freight business models, from Ultra-Low Cost Carriers to Full Service Airlines.

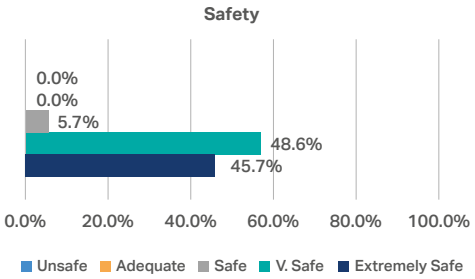
This group was responsible for approximately 88% of flights in Irish airspace and 87% of IAA ANSP's revenues during the year.

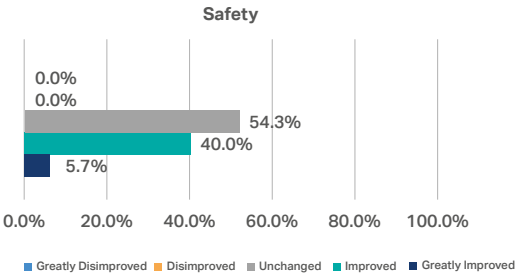
Since 2017, we have used a new format survey format. Customers were asked to provide their opinions of the IAA's ATM operation in the safety, financial and service delivery areas. The survey measured Customer attitudes, their perception of change and scores for overall Customer Service. Schuman collated the data from the survey responses and compiled a report for the IAA. The results of the survey are set out overleaf. Schuman contacted our Customers directly and asked them to complete an online survey/questionnaire which was hosted on the European Union's EU SURVEY website.

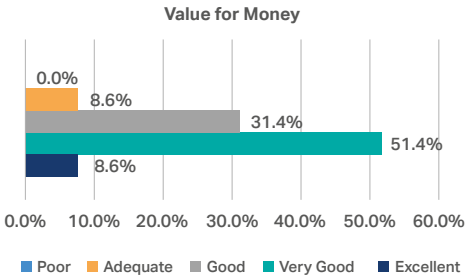
The results of the 2018 independent survey show that the overall level of Customer satisfaction with the IAA is 92.3%. This performance reflects the IAA's consistently low user charges, excellent delay performance, highly efficient airspace, ongoing support of the commercial aviation industry and high levels of Customer engagement.

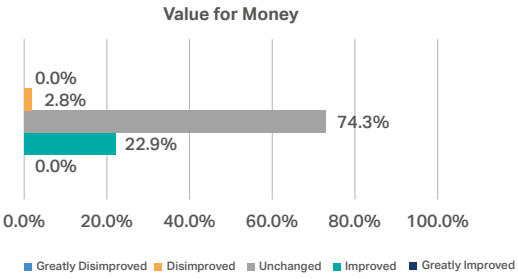
2018			2018		
Rank	Customer	%Total	Rank	Customer	%Total
1	British Airways	9.6%	16	JET2.COM	1.3%
2	Aer Lingus	8.8%	17	Thomas Cook Airlines	1.3%
3	Ryanair	7.6%	18	Turkish Airlines	1.2%
4	Delta Air Lines	7.5%	19	Norwegian Airshuttle	1.2%
5	United Airlines	7.0%	20	Air Transat	1.2%
6	American Airlines	6.0%	21	Stobart Air	1.1%
7	Lufthansa	4.8%	22	Federal Express	1.0%
8	Air France	4.1%	23	Norwegian Air Uk	0.9%
9	Virgin Atlantic	3.9%	24	Alitalia	0.9%
10	Air Canada	3.7%	25	Norwegian Air Intl	0.7%
11	KLM	2.8%	26	UPS	0.7%
12	Swiss	1.5%	27	Ethiopian Airlines	0.7%
13	Emirates	1.5%	28	Cargolux	0.7%
14	Thomson Airways	1.5%	29	Etihad Airways	0.6%
15	Qatar Airways	1.4%	30	Condor	0.5%

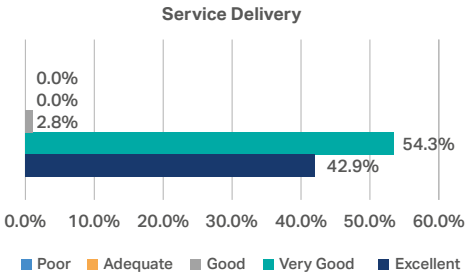
The results of the 2018 independent survey show that the overall level of Customer satisfaction with the IAA is 92.3%. This performance reflects the IAA's consistently low user charges, lack of delay, highly efficient airspace and high levels of Customer engagement. A summary of the feedback from our Customers from the 2018 survey is shown below.

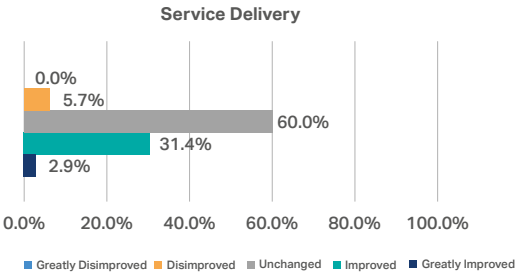


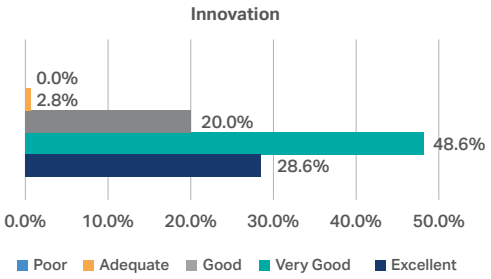


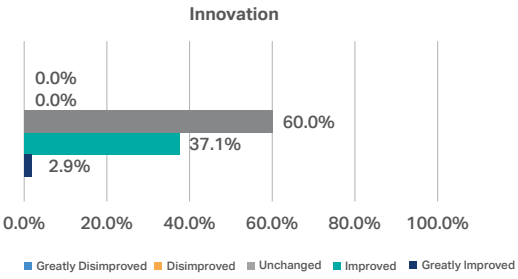


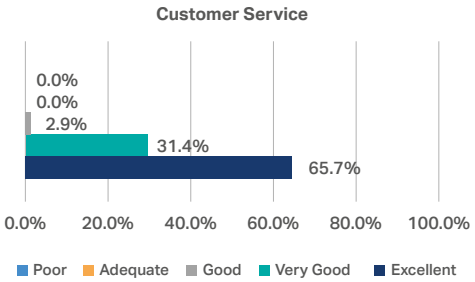


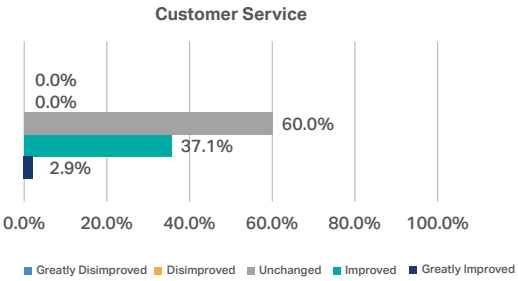












IAA Customer Care Programme Participants

Review of the RP2 Plan for 2018

Effectiveness of Safety Management						
	Score	**Safety Policy and Objectives**	**Safety Risk Management**	**Safety Assurance**	**Safety Promotion**	**Safety Culture**
State level	86	C	D	D	C	C
IAA	92	D	D	D	D	D

Note: For State level Safety Assurance does not include Q3.8 and Safety Culture is self-assessed. ANSP results are verified by the State.

Application of the severity classification of the Risk Analysis Tool (RAT)		
	RAT application (%)	
	ATM Ground	**ATM Overall**
Separation Minima Infringements (SMIs)	100%	100%
Runway Incursions (RIs)	n/a	100%
ATM Specific Occurrences (ATM-S)		100%
Source of RAT data:	IAA	

Note: The No of reported occurrences applicable to the RP2 Scope for the RAT application (AA-A to C and airports above 70k ATM movements)

Just culture		
State level	**Number of questions answered**	
	YES	**NO**
Policy and its implementation	9	0
Legal/Judiciary	7	0
Occurrence reporting and Investigation	2	0
TOTAL	**18**	**0**

IAA	**Number of questions answered**	
	YES	**NO**
Policy and its implementation	13	0
Legal/Judiciary	2	1
Occurrence reporting and Investigation	7	1
TOTAL	**22**	**2**

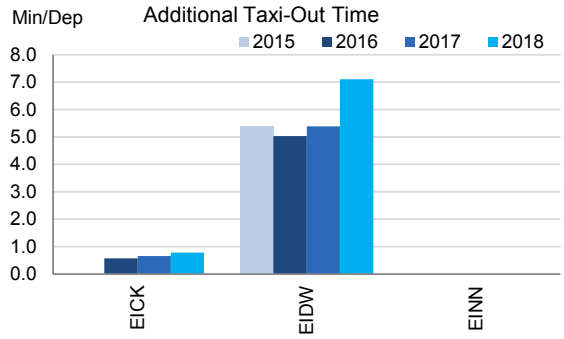
Observations
All four reviewed EoSM Components/areas of the State meet the target level "C"

IRELAND **Monitoring of Airports Contribution to ENVIRONMENT for 2018**

1. Overview

Ireland includes 3 airports under RP2 monitoring. Shannon is the only remaining airport that has not implemented the Airport Operator Data Flow required for the monitoring.
Ireland shall empower the airport reporting entity at Shannon (EINN) to establish the Airport Operator Data Flow to allow for the monitoring of all Irish airports in the UK-Ireland FAB Performance Plan.
Traffic at these Irish airports has moderately increased during RP2 (+17% with respect to 2015).
The environmental performance at Dublin has significantly worsened in 2018, resulting in the 4th highest additional taxi-out times in the SES area and the 3rd highest additional ASMA times.

2. Additional Taxi-Out Time

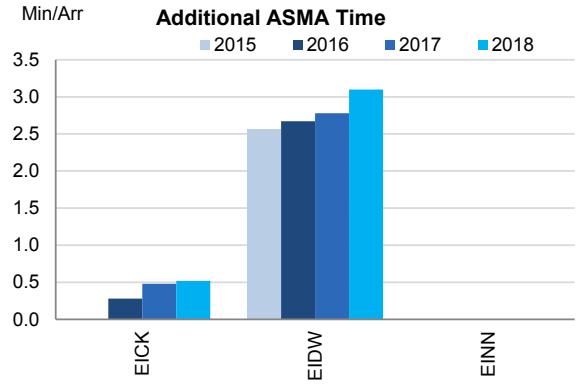


Taxi-out times at Dublin have significantly increased in 2018 (EIDW; 2017: 5.39 min/dep.; 2018: 7.11 min/dep.), with additional taxi-out times above 7 minutes from April to October.
Irish NSA acknowledges the increase of the taxi-out times at Dublin and it reports *this is largely due to the inefficient and complex taxiway layout at the airport. It should be noted that traffic at Dublin Airport increased by 4.5% in 2018, compared to the previous year.*

Taxi out times at Dublin airport are a result of infrastructure deficiencies at the aerodrome. Dublin airport is a single runway operation, currently operating at full capacity during peak periods. The design of the taxiway, apron and stand infrastructure is such there are a number of constraints which can cause taxi-out times to increase. The aerodrome manoeuvring area is populated with several bottlenecks which restrict the service providers ability to deal efficiently with departure peaks. In order to safely operate the infrastructure, it is necessary to apply several airport restrictions on entry and exit to taxiways and the runway. These restrictions which are outside the control of the IAA significantly contribute to taxi-out times and delays. In addition, with Dublin airport operating at full capacity for extended periods, the lack of a second runway and the lack of rapid exit taxiways on the existing runway (noting the importance of preventing runway incursions) may contribute to the additional taxi-out times.

The UK-Ireland FAB monitoring report also considers that *Additional Taxi-Out Time is not a useful metric for ANSP performance as there are too many contributing variables outside of the control of the ANSP.*

3. Additional ASMA Time



Dublin has also observed an increase of the additional time in the terminal airspace (EIDW; 2017: 2.78 min/arr.; 2018: 3.10 min/arr.), mainly resulting from the increase in the first half of 2018 with respect to 2017.
There is no significant change in the performance at Cork (EICK).
UK-Ireland FAB reports that *any arrival congestion at EIDW is a result of the airport operating at or close to capacity for long periods of the day, the infrastructure deficiencies at the aerodrome (lack of rapid exit taxiways, bottlenecks at runway threshold) as well as potentially inefficient slot allocation (not optimised to reduce arrival congestion) and weather related factors.*

The additional time is terminal airspace is generally attributable to the flights following the "Point Merge" legs in part or in full. However the Point Merge has been demonstrated to have considerable benefits to the Airspace Users in reduced fuel consumption and to the environment in lowering Co2 emissions around terminal areas, and maximising runway throughput compared to vertical holding. These benefits outweigh any impact on ASMA Time. As congestion levels at Dublin airport increase in the construction phase of a second runway and improvements to existing infrastructure, it is likely that ASMA times will further increase until the new runway is fully operational.

4. Appendix											
n/a: airport operator data flow not established, or more than two months of missing / non-validated data											
Airport Name	ICAO Code	Additional taxi-out time					Additional ASMA time				
		2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
Cork	EICK	n/a	0.58	0.66	0.79		n/a	0.28	0.48	0.52	
Dublin	EIDW	5.39	5.03	5.39	7.11		2.56	2.67	2.78	3.10	
Shannon	EINN	n/a	n/a	n/a	n/a		n/a	n/a	n/a	n/a	

En route Capacity incentive scheme						
	2015	2016	2017	2018	2019	Observations
National Capacity target	0.13	0.13	0.14	0.14	0.14	
Deadband +/-	0.00	0.00	0.00	0.00	0.00	
Actual performance	0.00	0.00	0.00	0.00		

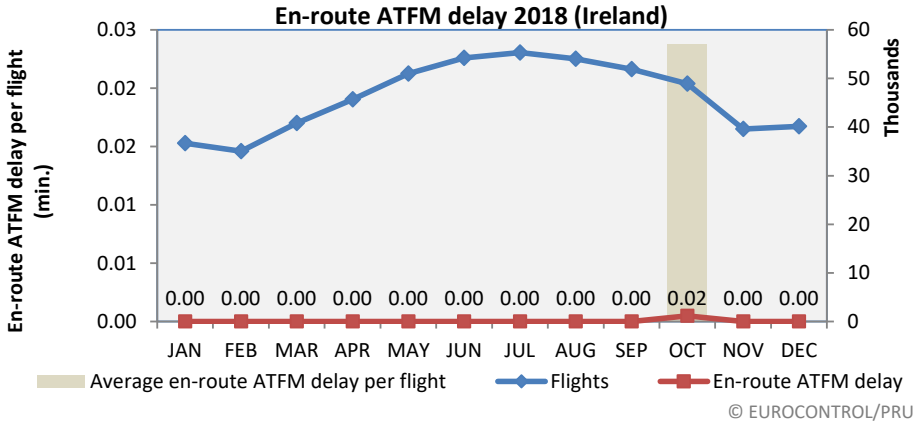
National capacity incentive scheme

Ireland does not receive a bonus since the overall FAB target was not met in 2018.

Compliance issues relating to national capacity incentive scheme

Nil

Observations regarding national capacity performance



En-route ATFM delay per flight (Ireland)										
2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	EUROCONTROL 7 year forecast February 2014 – Ireland										
	2014		2015		2016		2017		2018		2019
		actual		actual		actual		actual		actual	
High	538		557		573		589		607		624
Base	534	**537**	552	**566**	564	**610**	576	**621**	589	**635**	602
Low	528		540		547		553		560		568

Ireland continues to demonstrate excellent en route capacity performance. The achievement of zero delay provided a positive contribution to network performance. The high performance of the IAA is recognised since traffic levels in Ireland have consistently been above the high traffic scenario predicted by STATFOR and available when the FAB performance plans and associated capacity plans were being determined. It is noted that the Network Manager does not expect capacity problems in Ireland for the remainder of RP2, or for the entirety of RP3.

Ireland delay forecast						
	2019	2020	2021	2022	2023	2024
NOP 2018 - 2022	0.01	0.01	0.01	0.01	N/A	N/A
NOP 2019 - 2024	0.01	0.01	0.01			

IRELAND **Monitoring of Airports Contribution to CAPACITY for 2018**

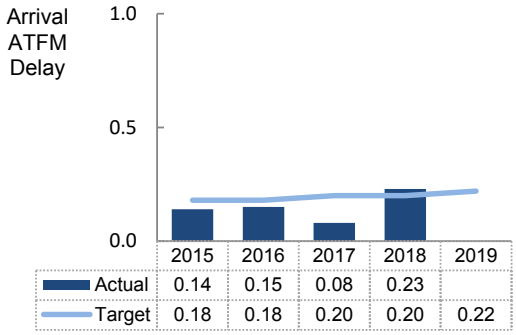
1. Overview

Ireland identifies 3 airports as subject to RP2, where traffic levels have significantly increased during RP2 (+16.7% with respect to 2015).
In terms of arrival ATFM delays, values are drastically higher than those in the beginning of the reference period (+65.0% in 2018 with respect to 2015) and at the same time ATFM slot adherence has slightly deteriorated (2015:96.9%; 2018:96.2%), although all 3 airports still show best-in-class performance with a compliance above 95%.

The national target on arrival ATFM delay is missed by the Irish airports for the first time in RP2.

The Airport Operator Data Flow, necessary for the calculation of the ATC pre-departure delay indicator, is at the time being implemented at 2 airports in Ireland (EIDW and EICK). Nonetheless, the high share of unexplained delay prevents the monitoring of the indicator at Cork (EICK).

2. Arrival ATFM Delay



	2015	2016	2017	2018	2019
Actual	0.14	0.15	0.08	0.23	
Target	0.18	0.18	0.20	0.20	0.22

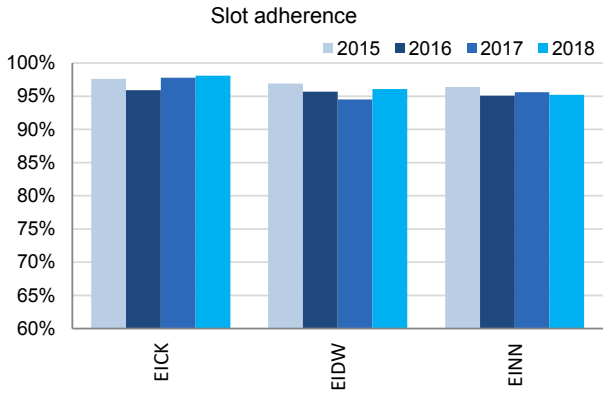
During 2018, arrival ATFM delays in Ireland have significantly increased with respect to the previous year (2017: 0.08 min/arr, 2018: 0.23 min/arr)
In fact this performance is directly associated to the constraints at Dublin (EIDW) as Cork (EICK) and Shannon (EINN) do not register any arrival ATFM delays.
The delays at Dublin are attributed mainly to aerodrome capacity (48%) and weather (47%). The distribution of these delays along the year is strange as the busiest months (July and August) there are practically no delays registered. In April all delays are attributed to weather while in May almost all delays are attributed to aerodrome capacity.

UK-Ireland FAB, in their monitoring report, explain that *ATFM arrival delay has increased mainly because of bad weather conditions and also because of the growth in traffic in already constrained periods without any significant enhancements in airport infrastructure. This has led to higher congestion, particularly during adverse weather conditions (e.g. low visibility, snow, high winds, etc.).*

3. Arrival ATFM Delay – National Target and Incentive Scheme

Ireland established a national target on arrival ATFM delay for 2018 of 0.20 min/arr. with a breakdown for Dublin. The target is missed at national level and the actual performance at Dublin (EIDW) also misses its reference value (EIDW: 2018: PP= 0.20 min/arr. vs Actual= 0.27 min/arr.)
The UK-Ireland FAB performance plan presents no (capacity) incentive scheme for the national target on arrival ATFM delay for Ireland.

4. ATFM Slot Adherence



The performance regarding ATFM slot adherence at the 3 Irish airports under RP2 monitoring is consistently around the 95% threshold, which marks best-in-class performance.

5. ATC Pre-departure Delay

The ATC pre-departure delay at Dublin has considerably increased in 2018. According to UK-Ireland FAB's monitoring report this is *mainly due to Dublin airport operating at full capacity for long periods throughout the day.*

In line with the reporting observed last year, the high share of pre-departure delay attributed to ambiguity codes does not allow for the calculation of the indicator at Cork (EICK). At Dublin this share is lower, but the share of ambiguity delay codes is still high and it risks the calculation of the ATC pre-departure delay indicator in the future.
The Airport Operator Data Flow, required for the monitoring of the ATC pre-departure delay, is not established for Shannon.
Ireland shall encourage the implementation of the Airport Operator Data Flow in Shannon and a proper reporting of the pre-departure delays through this data flow at all airports.

6. Appendix

n/a: airport operator data flow not established, or more than two months of missing / non-validated data

Airport Name	ICAO Code	Avg arrival ATFM delay					Slot adherence					ATC pre-departure delay				
		2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
Cork	EICK	0.00	0.00	0.00	0.00		97.6%	95.9%	97.8%	98.1%		n/a	n/a	n/a	n/a	
Dublin	EIDW	0.17	0.19	0.10	0.27		96.9%	95.7%	94.5%	96.1%		0.53	0.66	0.38	0.70	
Shannon	EINN	0.00	0.00	0.00	0.00		96.4%	95.1%	95.6%	95.2%		n/a	n/a	n/a	n/a	

IRELAND: En-route charging zone

Monitoring of en-route COST-EFFICIENCY for 2018

1. Contextual economic information: en-route air navigation services

- Ireland ECZ represents 2.0% of the SES en-route ANS determined costs in 2018
- ATSP: IAA
- FAB: UK-Ireland FAB
- National currency: EUR

2. En-route DUC monitoring at Charging Zone level

Ireland: Data from RP2 Performance Plan (EC Decision 2015/348 of 2 March 2015)	2015D	2016D	2017D	2018D	2019D
En-route costs (nominal EUR)	118 046 200	121 386 700	125 595 100	129 364 400	130 778 800
Inflation %	1.1%	1.2%	1.4%	1.7%	1.7%
Inflation index (100 in 2009)	103.7	105.0	106.4	108.2	110.1
Real en-route costs (EUR2009)	113 811 728	115 644 664	118 001 964	119 511 684	118 798 780
Total en-route Service Units	4 000 000	4 049 624	4 113 288	4 184 878	4 262 135
Real en-route unit cost per Service Unit (EUR2009)	**28.45**	**28.56**	**28.69**	**28.56**	**27.87**

Ireland: Actual data from Reporting Tables	2015A	2016A	2017A	2018A	2019A
En-route costs (nominal EUR)	106 657 766	108 543 638	113 784 000	117 767 000	
Inflation %	0.0%	-0.2%	0.3%	0.7%	
Inflation index (100 in 2009)	102.3	102.1	102.4	103.1	
Real en-route costs (EUR2009)	104 273 918	106 330 301	111 130 414	114 220 979	
Total en-route Service Units	4 182 450	4 467 595	4 465 253	4 549 883	
Real en-route unit cost per Service Unit (EUR2009)	**24.93**	**23.80**	**24.89**	**25.10**	

Difference between Actuals and Planned		2015	2016	2017	2018	2019
En-route costs (nominal EUR)	in value	-11 388 434	-12 843 062	-11 811 100	-11 597 400	
	in %	-9.6%	-10.6%	-9.4%	-9.0%	
Inflation %	in p.p.	-1.1 p.p.	-1.4 p.p.	-1.1 p.p.	-1.0 p.p.	
Inflation index (100 in 2009)	in p.p.	-1.4 p.p.	-2.9 p.p.	-4.0 p.p.	-5.1 p.p.	
Real en-route costs (EUR2009)	in value	-9 537 810	-9 314 363	-6 871 550	-5 290 705	
	in %	-8.4%	-8.1%	-5.8%	-4.4%	
Total en-route Service Units	in value	182 450	417 971	351 965	365 005	
	in %	4.6%	10.3%	8.6%	8.7%	
Real en-route unit cost per Service Unit (EUR2009)	**in value**	**-3.52**	**-4.76**	**-3.80**	**-3.45**	
	in %	**-12.4%**	**-16.7%**	**-13.2%**	**-12.1%**	

3. Focus on en-route at State/Charging Zone level

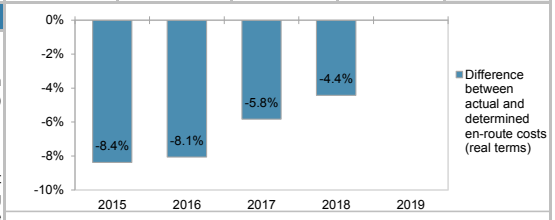
En-route unit cost
In 2018, the actual en-route unit cost in real terms (25.10 €2009) is -12.1% lower than planned in the PP (28.56 €2009). This results from the combination of higher than planned TSUs (+8.7%) and lower than planned en-route costs in real terms (-4.4%, or -5.3 M€2009).

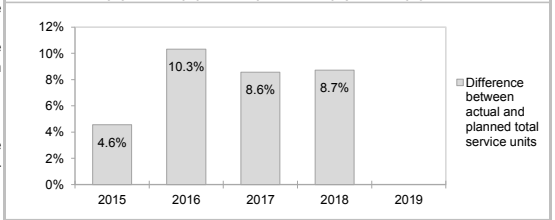
En-route service units
The difference between actual and planned TSUs (+8.7%) falls outside the ±2% dead band, but does not exceed the ±10% threshold foreseen in the traffic risk sharing mechanism. The resulting gain of additional en-route revenues is therefore shared between the ATSP and the airspace users, with the ATSP (IAA) retaining an amount of +4.3 M€2009.
According to STATFOR February 2019 base scenario, the en-route TSUs for Ireland are expected to largely exceed the ±2% dead band but stay within the ±10% threshold foreseen in the traffic risk-sharing mechanism for the remainder of RP2.

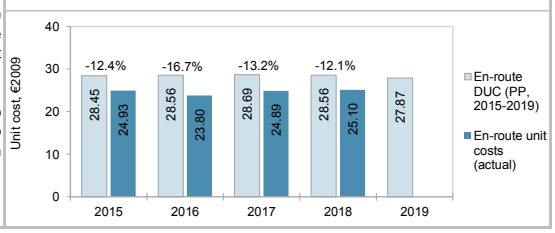
En-route costs
In nominal terms, actual en-route costs are -9.0% (-11.6 M€) lower than planned. However, since the actual inflation index is also lower than planned (-5.1 p.p.), actual en-route costs are -4.4% (-5.3 M€2009) below plans when expressed in real terms.

The lower than planned en-route costs in real terms are driven by IAA (-6.3%, or -6.4 M€2009) and the MET service provider (-4.2%, or -0.3 M€2009), while the costs for the NSA/EUROCONTROL (+13.6%, or +1.5 M€2009) are higher than planned. A detailed analysis at ATSP level is provided in box 12.

Costs exempt from cost-sharing are reported for a total amount of -0.8 M€2009 corresponding to the variation in EUROCONTROL costs. These costs will be eligible for carry-over (reimbursed to airspace users) to the following reference period(s), if deemed allowed by the European Commission.







IRELAND: En-route ATSP (IAA) **Monitoring of en-route COST-EFFICIENCY for 2018**

9. Focus on ATSP: Net ATSP gain/loss on en-route activity					
Cost sharing ('000 €2009)	**2015**	**2016**	**2017**	**2018**	**2019**
Determined costs for the ATSP (PP) - based on planned inflation	96 844	97 378	99 417	101 495	
Actual costs for the ATSP	87 495	88 091	92 092	95 053	
Difference in costs: gain (+)/Loss (-) retained/borne by the ATSP	9 349	9 287	7 325	6 442	
Amounts excluded from cost sharing to be recovered from (+) or reimbursed to (-) users	0	0	0	0	
Gain (+)/Loss (-) to be retained by the ATSP in respect of cost sharing	**9 349**	**9 287**	**7 325**	**6 442**	
Traffic risk sharing ('000 €2009)	**2015**	**2016**	**2017**	**2018**	**2019**
Difference in total service units (actual vs PP) %	4.6%	10.3%	8.6%	8.7%	
Determined costs for the ATSP (PP) - based on actual inflation	98 202	100 129	103 346	106 555	
Gain (+)/Loss (-) to be retained by the ATSP in respect of traffic risk sharing	**2 719**	**4 406**	**4 100**	**4 280**	
Incentives ('000 €2009)	**2015**	**2016**	**2017**	**2018**	**2019**
Gain (+)/Loss (-) to be retained by the ATSP in respect of incentives (bonus/penalty)	**1 014**	**0**	**1 087**	**0**	
Net ATSP gain(+)/loss(-) on en-route activity ('000 €2009)	**13 081**	**13 693**	**12 512**	**10 722**	

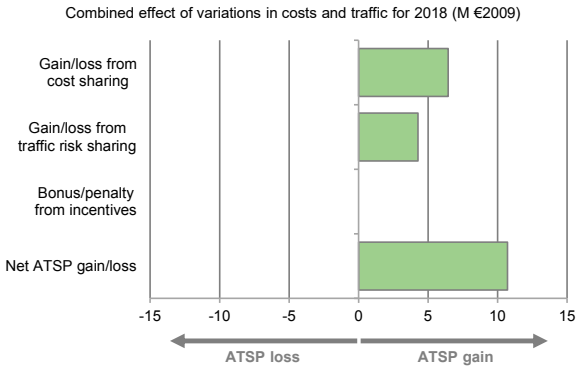
10. Focus on ATSP: En-route ATSP estimated surplus *					
* This calculation of the economic surplus retained by the ATSP is based on the determined RoE and on the information provided in the Reporting Tables. This is different from the accounting profit/loss reported in the P&L accounts of the ATSP.					
ATSP estimated surplus ('000 €2009) from RP2 Performance Plan	**2015P**	**2016P**	**2017P**	**2018P**	**2019P**
Total asset base	63 266	64 174	63 062	69 602	69 651
Estimated proportion of financing through equity (in %)	50.1%	49.9%	49.7%	49.4%	49.5%
Estimated proportion of financing through equity (in value)	31 674	32 047	31 358	34 418	34 444
Estimated proportion of financing through debt (in %)	49.9%	50.1%	50.3%	50.6%	50.5%
Estimated proportion of financing through debt (in value)	31 592	32 126	31 704	35 184	35 207
Cost of capital pre-tax (in value)	4 492	4 621	4 667	5 359	5 363
Average interest on debt (in %)	3.5%	3.6%	3.8%	4.1%	4.1%
Interest on debt (in value)	1 106	1 157	1 205	1 443	1 443
Determined RoE pre-tax rate (in %)	10.7%	10.8%	11.0%	11.4%	11.4%
Estimated surplus embedded in the cost of capital for en-route (in value)	3 386	3 464	3 462	3 917	3 920
Overall estimated surplus (+/-) for the en-route activity	**3 386**	**3 464**	**3 462**	**3 917**	**3 920**
Revenue/costs for the en-route activity	**96 844**	**97 378**	**99 417**	**101 495**	**101 272**
Estimated surplus (+/-) in percent of en-route revenues	**3.5%**	**3.6%**	**3.5%**	**3.9%**	**3.9%**
Estimated ex-ante RoE pre-tax rate (in %)	**10.7%**	**10.8%**	**11.0%**	**11.4%**	**11.4%**

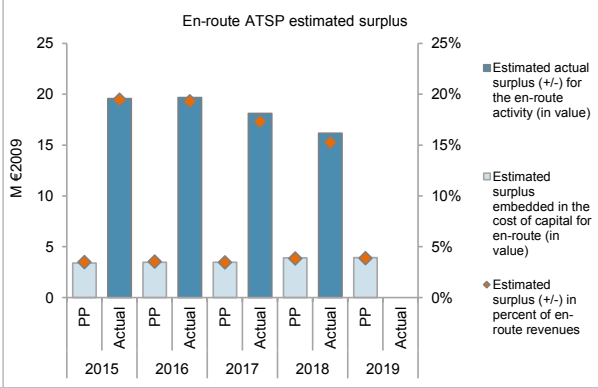
ATSP estimated surplus ('000 €2009) based on actual data from Reporting Tables	**2015A**	**2016A**	**2017A**	**2018A**	**2019A**
Total asset base	60 751	55 239	50 816	47 787	
Estimated proportion of financing through equity (in %)	100.0%	100.0%	100.0%	100.0%	
Estimated proportion of financing through equity (in value)	60 751	55 239	50 816	47 787	
Estimated proportion of financing through debt (in %)	0.0%	0.0%	0.0%	0.0%	
Estimated proportion of financing through debt (in value)	0	0	0	0	
Cost of capital pre-tax (in value)	6 494	5 971	5 610	5 438	
Average interest on debt (in %)	0.0%	0.0%	0.0%	0.0%	
Interest on debt (in value)	0	0	0	0	
Determined RoE pre-tax rate (in %)	10.7%	10.8%	11.0%	11.4%	
Estimated surplus embedded in the cost of capital for en-route (in value)	6 494	5 971	5 610	5 438	
Net ATSP gain(+)/loss(-) on en-route activity	13 081	13 693	12 512	10 722	
Overall estimated surplus (+/-) for the en-route activity	**19 575**	**19 664**	**18 122**	**16 160**	
Revenue/costs for the en-route activity	**100 576**	**101 784**	**104 604**	**105 775**	
Estimated surplus (+/-) in percent of en-route revenues	**19.5%**	**19.3%**	**17.3%**	**15.3%**	
Estimated ex-post RoE pre-tax rate (in %)	**32.2%**	**35.6%**	**35.7%**	**33.8%**	

IRELAND: En-route ATSP (IAA)

Monitoring of en-route COST-EFFICIENCY for 2018

11. Focus on ATSP: Summary of ATSP gain/loss on en-route activity and estimated surplus





12. Focus on en-route ATSP: General conclusions

Actual 2018 IAA en-route costs vs. PP

In 2018, IAA actual en-route costs are -6.3% (-6.4 M€2009) lower, in real terms, than planned in the PP. According to the additional information to the June 2019 en-route Reporting Tables, this results from a combination of:

- lower staff costs (-2.5%, or -1.5 M€2009) mainly "*due to higher than expected departures, retirements and recruitment occurring later than anticipated*";
- lower other operating costs (-11.5%, or -2.9 M€2009) mainly "*due to decreases across a range of technical and administrative expenses*";
- lower depreciation costs (-18.0%, or -2.1 M€2009) due to scheduling differences in the implementation of some projects; and,
- slightly higher cost of capital (+1.5%, or +0.08 M€2009) resulting from the combined effect of lower than planned actual asset base and higher than planned average rate of cost of capital. Concerning the latter, it is noted that the higher than planned weighted average rate of cost of capital results from a different gearing between equity and debt compared to the plan (actual capital entirely financed through equity, whereas the share of financing through debt was planned in the PP).

IAA net gain/loss on en-route activity in 2018

As shown in box 9, IAA generated a net gain of +10.7 M€2009 on the en-route activity. This is a combination of two elements:

- a gain of +6.4 M€2009 arising from the cost sharing mechanism; and,
- a gain of +4.3 M€2009 arising from the traffic risk sharing mechanism.

IAA overall estimated surplus for the en-route activity

Ex-post, the overall estimated surplus taking into account the net gain from the en-route activity mentioned above (+10.7 M€2009) and the surplus embedded in the actual cost of capital (+5.4 M€2009) amounts to +16.2 M€2009 (15.3% of the 2018 en-route revenues). The resulting ex-post rate of return on equity is 33.8%, which is much higher than the 11.4% planned in the PP.

IRELAND: Terminal charging zone

Monitoring of terminal COST-EFFICIENCY for 2018

1. Contextual economic information: terminal air navigation services

- Ireland TCZ represents 2.4% of the SES terminal ANS determined costs in 2018
- ATSP: IAA
- National currency: EUR
- Number of airports in charging zone in 2018: 3, of which:
  - Is this TCZ applying traffic risk sharing? Yes
  - Airports with fewer than 70,000 IFRs ATMs: 2
  - Airports with between 70,000 and 225,000 IFRs ATMs: 1
  - Airports with more than 225,000 IFRs ATMs: 0

2. Terminal DUC monitoring at Charging Zone level

Ireland: Data from RP2 Performance Plan	2015D	2016D	2017D	2018D	2019D
Terminal costs (nominal EUR)	24 272 300	25 787 100	26 584 700	27 424 700	28 007 800
Inflation %	1.1%	1.2%	1.4%	1.7%	1.7%
Inflation index (100 in 2009)	103.7	105.0	106.4	108.2	110.1
Real terminal costs (EUR2009)	23 401 621	24 567 276	24 977 462	25 335 966	25 442 140
Total terminal Service Units	141 200	144 400	148 200	152 900	156 900
Real terminal unit cost per Service Unit (EUR2009)	**165.73**	**170.13**	**168.54**	**165.70**	**162.16**

Ireland: Actual data from Reporting Tables	2015A	2016A	2017A	2018A	2019A
Terminal costs (nominal EUR)	22 332 565	23 207 720	23 880 000	24 245 000	
Inflation %	0.0%	-0.2%	0.3%	0.7%	
Inflation index (100 in 2009)	102.3	102.1	102.4	103.1	
Real terminal costs (EUR2009)	21 833 422	22 734 486	23 323 088	23 514 971	
Total terminal Service Units	149 863	163 305	171 665	182 711	
Real terminal unit cost per Service Unit (EUR2009)	**145.69**	**139.21**	**135.86**	**128.70**	

Difference between Actuals and Planned		2015	2016	2017	2018	2019
Terminal costs (nominal EUR)	in value	-1 939 735	-2 579 380	-2 704 700	-3 179 700	
	in %	-8.0%	-10.0%	-10.2%	-11.6%	
Inflation %	in p.p.	-1.1 p.p.	-1.4 p.p.	-1.1 p.p.	-1.0 p.p.	
Inflation index (100 in 2009)	in p.p.	-1.4 p.p.	-2.9 p.p.	-4.0 p.p.	-5.1 p.p.	
Real terminal costs (EUR2009)	in value	-1 568 198	-1 832 789	-1 654 373	-1 820 995	
	in %	-6.7%	-7.5%	-6.6%	-7.2%	
Total terminal Service Units	in value	8 663	18 905	23 465	29 811	
	in %	6.1%	13.1%	15.8%	19.5%	
Real terminal unit cost per Service Unit (EUR2009)	**in value**	**-20.04**	**-30.92**	**-32.67**	**-37.00**	
	in %	**-12.1%**	**-18.2%**	**-19.4%**	**-22.3%**	

3. Focus on terminal at State/Charging Zone level

This analysis focuses on Ireland Terminal Charging Zone (TCZ) comprising Dublin, Cork and Shannon airports.

Terminal unit cost

In 2018, the actual terminal unit cost in real terms (128.70 €2009) is -22.3% lower than planned in the PP (165.70 €2009). This results from the combination of much higher than planned TNSUs (+19.5%) and lower than planned terminal costs in real terms (-7.2%, or -1.8 M€2009).

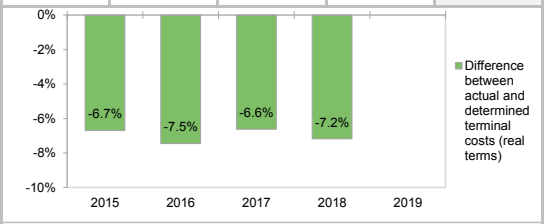
Terminal service units

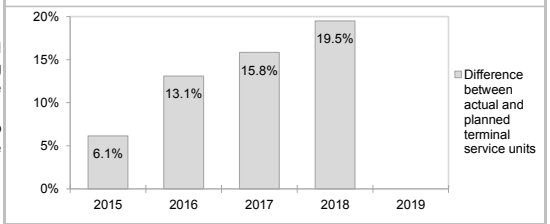
The traffic risk sharing mechanism applies in Ireland TCZ. The difference between actual and planned TNSUs (+19.5%) exceeds the ±10% threshold foreseen in the traffic risk sharing mechanism. The resulting gain of additional terminal revenues is therefore shared between the ATSP and the airspace users, with the ATSP (IAA) retaining an amount of +1.1 M€2009.
According to STATFOR February 2019 base scenario, the TNSUs for Ireland are expected to largely exceed the ±10% threshold foreseen in the traffic risk-sharing mechanism for the remainder of RP2.

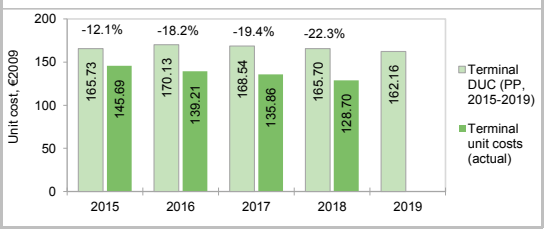
Terminal costs

In nominal terms, actual terminal costs are -11.6% (-3.2 M€) lower than planned. However, since the actual inflation index is also lower than planned (-5.1 p.p.), actual terminal costs are -7.2% (-1.8 M€2009) below plans when expressed in real terms.
The lower than planned terminal costs in real terms are driven by IAA (-8.4%, or -1.9 M€2009) and the MET service provider (-4.2%, or -0.1 M€2009), while the costs for the NSA (+25.5%, or +0.2 M€2009) are higher than planned. A detailed analysis at ATSP level is provided in box 12.

There are no costs exempt from cost-sharing reported.



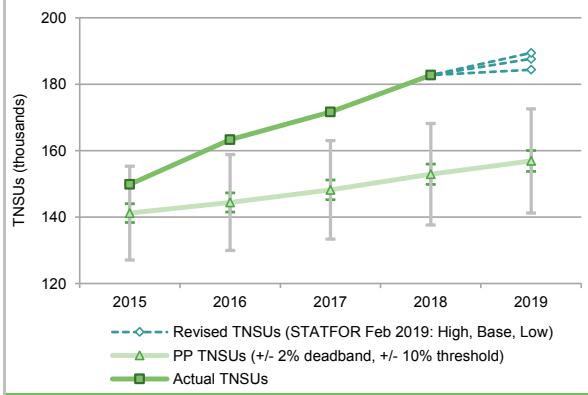




IRELAND: Terminal charging zone

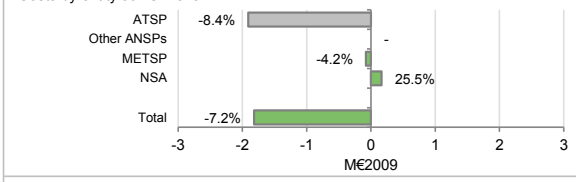
Monitoring of terminal COST-EFFICIENCY for 2018

4. Terminal traffic monitoring (Actual 2015-2019 TNSUs compared to PP)

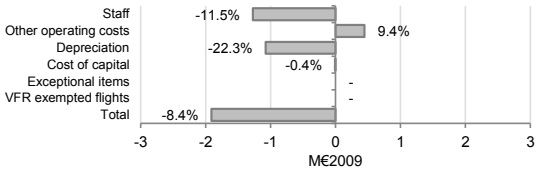


5. Terminal costs monitoring (2018 actuals compared to PP)

Costs by entity at TCZ level:



Costs by nature at ATSP level:

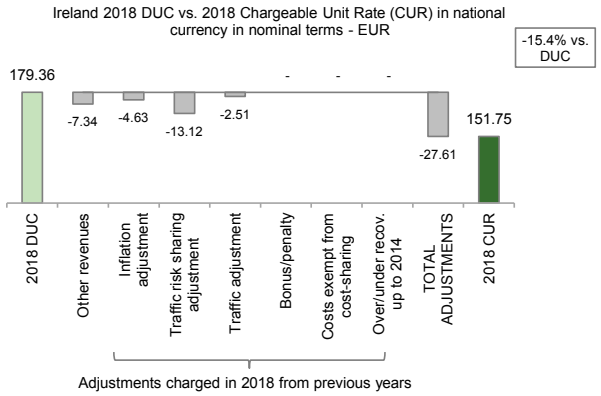


6. Terminal costs exempt from cost sharing

Estimates ('000 €2009)		2015	2016	2017	2018	2019
by item	Pension	0	0	0	0	
	Interest rates on loans	0	0	0	0	
	Taxation law	0	0	0	0	
	New cost item required by law	0	0	0	0	
	International agreements	0	0	0	0	
by entity	ATSP	0	0	0	0	
	Other ANSP	0	0	0	0	
	METSP	0	0	0	0	
	NSA	0	0	0	0	
Total costs exempt from cost sharing		**0**	**0**	**0**	**0**	

These costs will be recovered from (+) or reimbursed to (-) users if eligible after EC verification.

7. Terminal DUC 2018 vs. 2018 Unit Rate charged to users

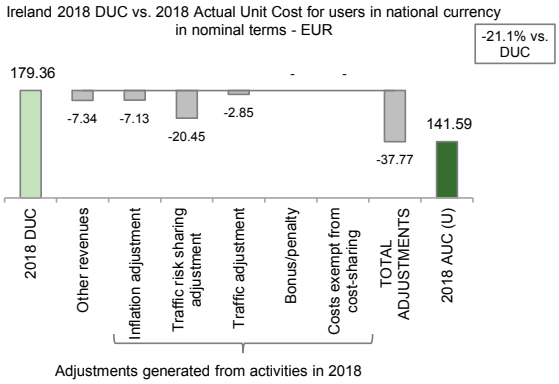


The terminal unit rate charged to airspace users (CUR) in 2018 is 151.75 €. This is -15.4% lower than the nominal DUC (179.36 €). The difference between these two figures (-27.61 €) mainly relates to:

- the deduction of other revenues (-7.34 €, mainly from Union assistance programmes);
- the inflation adjustment (-4.63 €), corresponding to lower than planned inflation index for 2016, to be reimbursed to airspace users in 2018; and,
- a traffic risk sharing adjustment (-13.12 €), which reflects the gain in revenues due to higher than planned traffic in 2016, to be reimbursed to airspace users in 2018.

These costs and adjustments are divided by the **forecast** TNSUs for 2018 as laid out in the RP2 performance plan.

8. Terminal DUC 2018 vs. 2018 Actual Unit Cost for users



The actual terminal unit cost incurred by airspace users (AUC-U) in respect of activities performed in 2018 (141.59 €) is -21.1% lower than the nominal DUC (179.36 €). The difference between these two figures (-37.77 €) is mainly due to:

- the deduction of other revenues (-7.34 € mainly from Union assistance programmes);
- the inflation adjustment (-7.13 €), reflecting the impact of lower than planned inflation index in 2018, which will be reimbursed to airspace users in 2020; and,
- a traffic risk sharing adjustment (-20.45 €), which reflects the gain in revenues due to higher than planned traffic in 2018, to be reimbursed to airspace users in 2020.

These costs and adjustments (**for other revenues see Reader's Guide**) are divided by the **actual** TNSUs in 2018.

IRELAND: Terminal ATSP (IAA) **Monitoring of terminal COST-EFFICIENCY for 2018**

9. Focus on ATSP: Net ATSP gain/loss on terminal ANS activity					
Cost sharing ('000 €2009)	**2015**	**2016**	**2017**	**2018**	**2019**
Determined costs for the ATSP (PP) - based on planned inflation	21 113	21 994	22 350	22 866	
Actual costs for the ATSP	19 584	20 241	20 710	20 956	
Difference in costs: gain (+)/Loss (-) retained/borne by the ATSP	1 529	1 752	1 639	1 910	
Amounts excluded from cost sharing to be recovered from (+) or reimbursed to (-) users	0	0	0	0	
Gain (+)/Loss (-) to be retained by the ATSP in respect of cost sharing	**1 529**	**1 752**	**1 639**	**1 910**	
Traffic risk sharing ('000 €2009)	**2015**	**2016**	**2017**	**2018**	**2019**
Difference in total service units (actual vs PP) %	6.1%	13.1%	15.8%	19.5%	
Determined costs for the ATSP (PP) - based on actual inflation	21 409	22 615	23 233	24 006	
Gain (+)/Loss (-) to be retained by the ATSP in respect of traffic risk sharing	**694**	**995**	**1 022**	**1 056**	
Incentives ('000 €2009)	**2015**	**2016**	**2017**	**2018**	**2019**
Gain (+)/Loss (-) to be retained by the ATSP in respect of incentives (bonus/penalty)	**0**	**0**	**0**	**0**	
Net ATSP gain(+)/loss(-) on terminal activity ('000 €2009)	**2 223**	**2 748**	**2 662**	**2 966**	

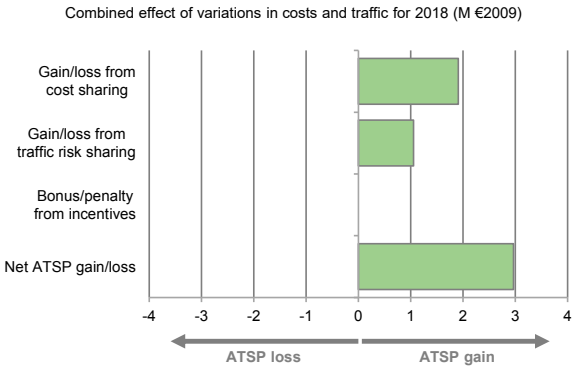
10. Focus on ATSP: Terminal ATSP estimated surplus *					
* This calculation of the economic surplus retained by the ATSP is based on the determined RoE and on the information provided in the Reporting Tables. This is different from the accounting profit/loss reported in the P&L accounts of the ATSP.					
ATSP estimated surplus ('000 €2009) from RP2 Performance Plan	**2015P**	**2016P**	**2017P**	**2018P**	**2019P**
Total asset base	28 500	30 343	28 431	29 203	30 204
Estimated proportion of financing through equity (in %)	50.0%	50.0%	49.7%	49.3%	49.3%
Estimated proportion of financing through equity (in value)	14 246	15 168	14 135	14 407	14 896
Estimated proportion of financing through debt (in %)	50.0%	50.0%	50.3%	50.7%	50.7%
Estimated proportion of financing through debt (in value)	14 253	15 176	14 296	14 796	15 308
Cost of capital pre-tax (in value)	2 023	2 184	2 104	2 249	2 326
Average interest on debt (in %)	3.5%	3.6%	3.8%	4.1%	4.1%
Interest on debt (in value)	499	546	543	607	628
Determined RoE pre-tax rate (in %)	10.7%	10.8%	11.0%	11.4%	11.4%
Estimated surplus embedded in the cost of capital for terminal (in value)	1 524	1 638	1 560	1 642	1 698
Overall estimated surplus (+/-) for the terminal activity	**1 524**	**1 638**	**1 560**	**1 642**	**1 698**
Revenue/costs for the terminal activity	**21 113**	**21 994**	**22 350**	**22 866**	**23 111**
Estimated surplus (+/-) in percent of terminal revenues	**7.2%**	**7.4%**	**7.0%**	**7.2%**	**7.3%**
Estimated ex-ante RoE pre-tax rate (in %)	**10.7%**	**10.8%**	**11.0%**	**11.4%**	**11.4%**

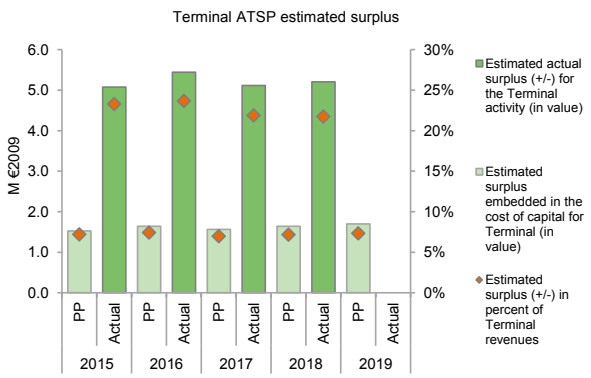
ATSP estimated surplus ('000 €2009) based on actual data from Reporting Tables	**2015A**	**2016A**	**2017A**	**2018A**	**2019A**
Total asset base	26 685	24 950	22 241	19 653	
Estimated proportion of financing through equity (in %)	100.0%	100.0%	100.0%	100.0%	
Estimated proportion of financing through equity (in value)	26 685	24 950	22 241	19 653	
Estimated proportion of financing through debt (in %)	0.0%	0.0%	0.0%	0.0%	
Estimated proportion of financing through debt (in value)	0	0	0	0	
Cost of capital pre-tax (in value)	2 855	2 695	2 455	2 240	
Average interest on debt (in %)	0.0%	0.0%	0.0%	0.0%	
Interest on debt (in value)	0	0	0	0	
Determined RoE pre-tax rate (in %)	10.7%	10.8%	11.0%	11.4%	
Estimated surplus embedded in the cost of capital for terminal (in value)	2 855	2 695	2 455	2 240	
Net ATSP gain(+)/loss(-) on terminal activity	2 223	2 748	2 662	2 966	
Overall estimated surplus (+/-) for the terminal activity	**5 078**	**5 442**	**5 117**	**5 207**	
Revenue/costs for the terminal activity	**21 807**	**22 989**	**23 372**	**23 923**	
Estimated surplus (+/-) in percent of terminal revenues	**23.3%**	**23.7%**	**21.9%**	**21.8%**	
Estimated ex-post RoE pre-tax rate (in %)	**19.0%**	**21.8%**	**23.0%**	**26.5%**	

IRELAND: Terminal ATSP (IAA)

Monitoring of terminal COST-EFFICIENCY for 2018

11. Focus on ATSP: Summary of ATSP gain/loss on terminal activity and estimated surplus





12. Focus on terminal ATSP: General conclusions

Actual 2018 IAA terminal costs vs. PP

In 2018, IAA actual terminal costs are -8.4% (-1.9 M€2009) lower, in real terms, than planned in the PP. According to the additional information to the June 2019 terminal Reporting Tables, this results from a combination of:

- much lower staff costs (-11.5%, or -1.3 M€2009) "*due to higher than expected departures, retirements and recruitment occurring later than anticipated*";
- higher other operating costs (+9.4%, or +0.4 M€2009);
- much lower depreciation costs (-22.3%, or -1.1 M€2009) due to scheduling differences in the implementation of some projects; and,
- slightly lower cost of capital (-0.4%, or -0.01 M€2009) resulting from the combined effect of lower than planned actual asset base and higher than planned average rate of cost of capital. Concerning the latter, it is noted that the higher than planned weighted average rate of cost of capital results from a different gearing between equity and debt compared to the plan (actual capital entirely financed through equity, whereas the share of financing through debt was planned in the PP).

IAA net gain/loss on terminal activity in 2018

As shown in box 9, IAA generated a net gain of +3.0 M€2009 on the terminal activity. This is a combination of two elements:

- a gain of +1.9 M€2009 arising from the cost sharing mechanism; and,
- a gain of +1.1 M€2009 arising from the traffic risk sharing mechanism.

IAA overall estimated surplus for the terminal activity.

Ex-post, the overall estimated surplus taking into account the gain from the terminal activity mentioned above (+3.0 M€2009) and the surplus embedded in the actual cost of capital (+2.2 M€2009) amounts to +5.2 M€2009 (21.8% of the 2018 terminal revenues). The resulting ex-post rate of return on equity is 26.5%, which is much higher than the 11.4% planned in the PP.

IRELAND: Gate-to-gate

Monitoring of gate-to-gate COST-EFFICIENCY for 2018

1. Monitoring of gate-to-gate ANS costs

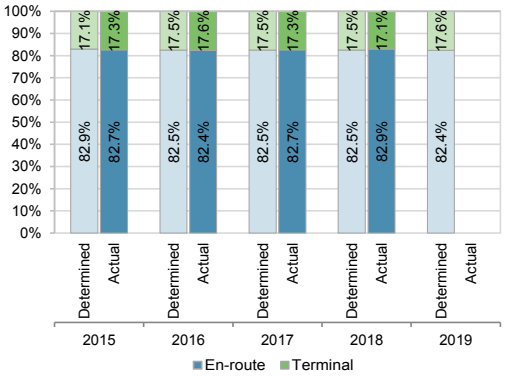
Ireland: Data from RP2 Performance Plan		2015D	2016D	2017D	2018D	2019D
Real en-route costs (EUR2009)		113 811 728	115 644 664	118 001 964	119 511 684	118 798 780
Real terminal costs (EUR2009)		23 401 621	24 567 276	24 977 462	25 335 966	25 442 140
Real gate-to-gate costs (EUR2009)		137 213 349	140 211 940	142 979 426	144 847 650	144 240 920
En-route share (%)		82.9%	82.5%	82.5%	82.5%	82.4%
Ireland: Actual data from Reporting Tables		**2015A**	**2016A**	**2017A**	**2018A**	**2019A**
Real en-route costs (EUR2009)		104 273 918	106 330 301	111 130 414	114 220 979	
Real terminal costs (EUR2009)		21 833 422	22 734 486	23 323 088	23 514 971	
Real gate-to-gate costs (EUR2009)		126 107 341	129 064 787	134 453 503	137 735 950	
En-route share (%)		82.7%	82.4%	82.7%	82.9%	
Difference between Actuals and Planned (Actuals vs. PP)		**2015**	**2016**	**2017**	**2018**	**2019**
Real gate-to-gate costs (EUR2009)	in value	-11 106 008	-11 147 153	-8 525 923	-7 111 700	
	in %	-8.1%	-8.0%	-6.0%	-4.9%	
En-route share	in p.p.	-0.3 p.p.	-0.1 p.p.	0.1 p.p.	0.4 p.p.	

2. Share of en-route and terminal in gate-to-gate actual costs (2018)

In 2018, actual gate-to-gate ANS costs are -4.9% (-7.1 M€2009) lower than planned due to lower than planned en-route costs (-4.4%, or -5.3 M€2009) and terminal costs (-7.2%, or -1.8 M€2009).

The actual share of en-route in gate-to-gate ANS costs (82.9%) is in line with that planned in the PP for 2018 (82.5%).

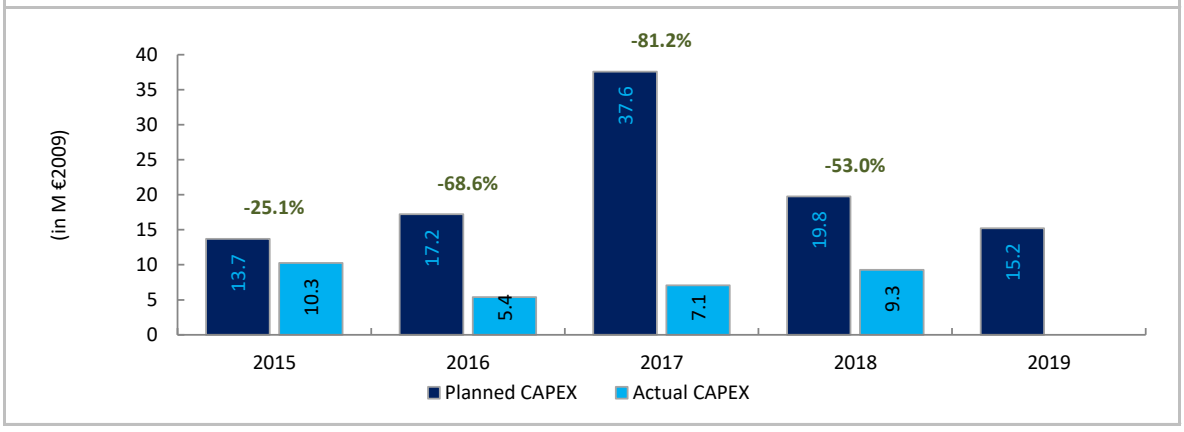
For IAA, the estimated gate-to-gate economic surplus in 2018 amounts to 21.4 M€2009 (see boxes 10 for the detailed analysis at charging zone level), corresponding to 16.5% of gate-to-gate ANS revenues.



3.Technical notes on en-route and terminal information reported by Ireland

IRELAND **Monitoring of CAPEX for 2018**

Contextual Information						
ANSP: IAA						
FAB: UK-Ireland FAB						
Currency: EUR						
Data from RP2 National Performance Plan	2015P	2016P	2017P	2018P	2019P	RP2P
Total CAPEX (in nominal M)	14.2	18.1	40.0	21.4	16.8	110.4
Main CAPEX (in nominal M)	8.1	11.5	37.6	21.0	15.8	93.8
Inflation %	1.1%	1.2%	1.4%	1.7%	1.7%	
Inflation index (100 in 2009)	103.7	105.0	106.4	108.2	110.1	
Exchange rate 2009	1	1	1	1	1	
Total CAPEX (in M €2009)	**13.7**	**17.2**	**37.6**	**19.8**	**15.2**	**103.4**
Main CAPEX (in M €2009)	7.8	10.9	35.3	19.4	14.3	87.7
% Main of Total CAPEX	56.8%	63.4%	94.0%	98.0%	94.1%	84.8%
Real gate-to-gate ANSP costs (in M €2009)	118.0	119.4	121.8	124.4	124.4	607.8
Total CAPEX as % of Real gate-to-gate ANSP costs	11.6%	14.4%	30.9%	15.9%	12.2%	17.0%
Actual data from FAB Monitoring Report	2015A	2016A	2017A	2018A	2019A	RP2A
Total CAPEX (in nominal M)	10.5	5.5	7.2	9.6		
Main CAPEX (in nominal M)	7.9	3.3	3.9	7.0		
Inflation %	0.0%	-0.2%	0.3%	0.7%		
Inflation index (100 in 2009)	102.3	102.1	102.4	103.1		
Exchange rate 2009	1	1	1	1		
Total CAPEX (in M €2009)	**10.3**	**5.4**	**7.1**	**9.3**		
Main CAPEX (in M €2009)	7.7	3.3	3.8	6.7		
% Main of Total CAPEX	75.6%	60.6%	53.3%	72.8%		
Real gate-to-gate ANSP costs (in M €2009)	107.1	108.3	112.8	116.0		
Total CAPEX as % of Real gate-to-gate ANSP costs	9.6%	5.0%	6.3%	8.0%		
Actuals vs Planned in absolute value & percentage	2015	2016	2017	2018	2019	RP2
Total CAPEX (in nominal M)	-3.7	-12.6	-32.7	-11.8		
Total CAPEX (in M €2009)	-3.4	-11.8	-30.5	-10.5		
Total CAPEX (in %, M €2009)	**-25.1%**	**-68.6%**	**-81.2%**	**-53.0%**		



Glossary

A

ACC	Area Control Centre
ACE	ATM Cost Effectiveness (Eurocontrol performance benchmarking report)
ADS-B	Autonomous Dependent System Broadcast
ANS	Air Navigation Services
ANSP	Air Navigation Services Provider
ASMGCS	Advanced-Surface Movement Guidance and Control System
ATCO	Air Traffic Controller
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
ATN	Aeronautical Telecommunications Network

ANS	Air Navigation Services
ANSP	Air Navigation Services Provider
ASMGCS	Advanced-Surface Movement Guidance and Control System
ATCO	Air Traffic Controller
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
ATN	Aeronautical Telecommunications Network

C

CANSO	Civil Air Navigation Services Organisation
CAPEX	Capital Expenditure
CAR	Commission for Aviation Regulation
COOPANS	Co-operation in the Procurement of ATM Systems
CPDLC	Controller–Pilot Data Link Communications

C

DAOPG	Dublin Airport Operational Planning Group
DSNA	Direction des Services de la Navigation Aérienne (French ANSP)
DSOT	Dynamic Sectorisation

E

EASA	European Aviation Safety Agency
ENSURE	Enroute Shannon Upper airspace Re-Design
EoSM	Effectiveness of Safety Management

I

IAA	Irish Aviation Authority
ICAO	International Civil Aviation Organisation
IFR	Instrument Flight Rules
INEA	Innovation and Networks Executive Agency

M

MOR	Mandatory Occurrence Reporting

N

NATS UK	National Air Traffic Service UK
NAT	North Atlantic Traffic
NOSS	Normal Operational Safety Surveys
NSA	National Supervisory Authority

P

PI	Performance Indicator

R

RNAV	Area Navigation
RAT	Risk Assessment Tool
RP	Reference period

S

SASP	Separation and Airspace Safety Panel
SES	Single European Sky
SESAR	Single European Sky ATM Research
SKPI	Safety Key Performance Indicator
SMS	Safety Management System
SMU	Safety Management Unit
SOE	Standard of Excellence
SPR	Safety Performance Report
SRD	Safety Regulation Directorate
SSF	Stakeholder Safety Forum

U

USM	Unit Safety Manager

V

VoIP	Voice over Internet Protocol

X

XMAN	Cross Border Arrival Management


IAA