The Irish Aviation Authority (IAA)

ANNUAL PERFORMANCE REPORT

2016

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CHIEF EXECUTIVE'S INTRODUCTION

EAMONN BRENNAN
CHIEF EXECUTIVE

It gives me great pleasure to introduce the annual performance report for the Irish Aviation Authority (IAA) covering the performance of the Air Navigation Services function, for the year 2016.

The Authority, throughout 2016, continued to deliver safe, efficient and cost-effective air navigation services in Irish controlled airspace and this report sets out our performance as required under common requirements laid down in Commission Regulation (EC) 448/2014, which amends EC Regulation no 1035/2011.

Competitive Efficiency: 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. Our gate-to gate financial cost effectiveness is some 27% more efficient than the European average and our gate-to-gate costs have increased by less than 1% over the last eight years compared to an estimated increase of 4.9% in the European average. We are one of the most productive air navigation service providers in Europe. Our en route customer charge for 2017 of €29.54 is, once again, one of the lowest in Europe. The IAA reported no air traffic management attributable delays in 2016 at Cork, Dublin and Shannon airports. Airport slot adherence statistics demonstrate a performance level above the EU standard.

Air Traffic Management: The Operations and Technology directorates delivered a safe, efficient and reliable service to our airline customers in 2016. We met, and exceeded, the targets of the EU Performance Scheme for environment and capacity, offering direct routings for airlines with no IAA attributable air traffic management delays. 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 is our air traffic management system (**COOPANS**). The COOPANS alliance is an international partnership between the air navigation service providers of Ireland, Austria, Croatia, Denmark 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. In 2015, the partners successfully upgraded their common air traffic management system across 7 centres over a two-week period. This was done seamlessly with no impact on operations, demonstrating a level of co-operation which is unique in the industry. Work is continuing between the COOPANS Alliance and the DSNA (the air navigation services provider in France) to investigate the possibility of introducing a common system in the years ahead. COOPANS has reduced our system provision cost by 30%.

In early 2015, the UK/Ireland FAB (**Functional Airspace Block**) Performance Plan 2015 to 2019 was approved by the EU. This Plan sets out the State's en route and terminal customer charges for the five years and contains national and joint FAB targets for safety, environment (en route flight efficiency), capacity (delays) and cost-efficiency. Ireland met all of its targets in 2016. Within the scope of FAB activities, the IAA has worked closely with NATS in the UK in relation to the X-Man trial and the completion of the Dynamic Sectorisation Operational Trial (DSOT).

CHIEF EXECUTIVE'S INTRODUCTION (CONTINUED)

Strategic Alliances: IAA is a shareholder in Aireon LLC, a US company developing space based global air traffic surveillance systems. Aireon will revolutionise the way air traffic is managed. The Aireon ALERT service, to be hosted at our Ballygirreen location, is the aviation industry's first and only free, real-time emergency location service. Aireon will provide for 100% global air traffic surveillance for suitably equipped ADS-B aircraft.

We continue to co-operate effectively with Entry Point North in its provision of air traffic training services to the IAA. ATM training is of the highest quality, regulatory compliant and cost-effective.

The IAA is participating with a number of other air traffic management companies, airlines and airports in the management of the EU SESAR (**Single European Sky Air Traffic Management Research and Development**) Deployment Manager. The Deployment Manager has a budget in the order of €3 billion to be assigned to the modernisation of European airspace.

The IAA continued to support the work of Borealis, a nine-member ANSP alliance, and has used the Alliance to market commercial service opportunities. During 2016, work continued on the implementation of Free Route Airspace across the entire airspace for the region by 2018 (the IAA introduced this operational concept in 2010 but is supporting this wider Borealis initiative).

Human Resources: A significant five-year collective agreement was signed with IMPACT union covering the period 2015 to 2019. The 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. The duration of the agreement aligns with the current economic regulatory period under Single European Sky legislation 2015 to 2019. The Agreement also makes provision for a 1.5% annual pay increase in respect of the years 2016 to 2019 inclusive. Agreement was reached with staff representatives on a new Internal Dispute Resolution Board (IDRB). The Board comprises three independent senior industrial relations practitioners and will manage disputes of a collective nature within the IAA. Outcomes from the IDRB will be binding on all parties.

Customer Consultation: The IAA will continue to consult regularly with its customers in the evaluation of the quality of service provided. The IAA is dedicated to improving its performance and to greater consultation with our customers, to ensure that our level of service continues to improve. We have made strong progress again in 2016 in positioning the IAA to safely meet these service requirements and also to meet future challenges in what is a dynamic and changing industry.

I would like to thank all of the staff of the Authority for delivering another successful year. In particular, I would like to express my gratitude to my management colleagues for their hard work and support throughout another challenging year.

I would also like to thank the Chairman, Ms. Anne Nolan and my colleagues on the Board for their guidance and support.

Go raibh míle maith agaibh go léir.

Eamonn Brennan
Chief Executive

September 2017

1. INTRODUCTION

The Irish Aviation Authority is required under Single European Sky (SES) regulations to produce an annual report on its performance.

The Single European Sky regulations provide, inter alia, that the provision of air navigation services within the European Community shall be subject to certification by Member States that they meet the **common requirements laid down in Commission Regulation (EC) 448/2014, which amends EC Regulation no 1035/2011**. 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 National Supervisory Authority (NSA), which is currently within the Safety Regulation Division 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 NSA certification.

Air Navigation Service Providers (ANSPs) must submit to their NSA, a five-year Business Plan, an Annual ANS Plan, and audited accounts. In addition, ANSPs must submit an Annual Performance Report at the end of their reporting period. A brief summary of the requirements under each of these areas is as follows.

1.1 Five Year Business Plan

The IAA's Business Plan is required to cover a minimum period of five years and set out:

- the overall aims and goals of the provider, and its strategy towards achieving them, in consistency, with any overall longer term plans and with relevant Community requirements;
- Appropriate performance objectives in terms of quality and level of service, safety and cost effectiveness.

1.2 Annual Plan

The **Annual Plan** specifically relates to the ANSP and should specify further the features of the Business Plan and describe any changes to it. The annual plan shall cover the following provisions on the level and quality of service such as the expected level of capacity, safety and delays to flights incurred as well as on financial arrangements:

- Information on the implementation of new infrastructure or other developments and a Statement on how they will contribute to improving the level and quality of services;
- Indicators of performance against which the level and quality of service may be reasonably assessed;
- The service provider's expected short-term financial position as well as any changes to or impacts on the business plan.

1.3 Annual Report

The **Annual 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 is primarily concerned with the areas outlined in 1.3 above and covers the period **1 January 2016 to 31 December 2016** 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 2016 against planned performance in the IAA's five year corporate plan 2016-2020"**.

The Authority provided forecasts in its five year corporate plan 2016-2020 in the following areas.

- Safety
- Efficiency
- Cost effectiveness
- Delays
- 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.

2. ATM SAFETY

2.1 Corporate ATM Safety Strategy

The Safety Management System (SMS) within the IAA Air Navigation Service Provider (ANSP) provides the vehicle by which we will continue to develop and mature our safety management system, while simultaneously meeting the regulatory requirements and safety targets set by EASA, for Reference Period 2 (RP2). The IAA has a strong and effective SMS, which is continuing to mature and progress in a manner that will enable us to achieve in the first instance the required maturity level and performance score target set for RP2.

New regulatory ANSP safety performance measurement requirements, in combination with the civil aviation regulators mandatory requirements to provide a more cost efficient service, pose very significant organisational challenges in the Performance Reference Period (RP2; 2015-2019 inclusive).

The IAA continued to concentrate its efforts on a number of interconnected focus areas, which are driven by associated strategic safety goals, contained in the Corporate ATM Strategic Safety Plan 2016-2020. This plan focuses on four thematic elements (People Create Safety, Safety Intelligence, Tailored & Proportionate, and Challenging & Learning) which underpin the IAA's strategic safety goals.

2.2 Safety Performance Indicators

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 Safety Performance Indicators as required by EC Regulation 390/2013, which have been monitored since 2012 and measured since 2014 at European, National and FAB levels. These are:

1) **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 Surveys are completed by the Safety Management Unit (SMU) annually.

- The IAA ANSP scored 92% (Table 1) in the EASA survey (RP2) measurement, which is an improvement on the 2015 performance score and is 12% above all SES ANSPs' average score.

TABLE 1

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%

- **CANSO/Eurocontrol**. The outcome from this EoSM separate process 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, ranking first out of 47 states in the EUROCONTROL CANSO Global SMS Standard of Excellence Measurement in 2016. It should be noted that this measurement underwent a significant review 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 results of the 2016 CANSO SOE Questionnaire results shall not be directly compared with the scores of the previous year.

TABLE 2

IAA ANSP CANSO/Eurocontrol Standard of Excellence/Overall maturity score		
2014	78%	
2015	86.5%	CANSO/ECTL Average 67%
2016 *	80.7%	CANSO/ECTL Average 66%

**Note: 2016 score is not comparable to 2014 and 2015 scores due to the change in methodology used in the survey*

2) Application of the severity classification scheme of the **Risk Assessment Tool (RAT) methodology**.

- This process is well embedded and all occurrences (i.e. Separation Minima Infringements, Runway Incursions and ATM Specific Occurrences) as required by Reference Period 2 (RP2), are reviewed and classified in accordance with this scheme, however we are continuing to develop the level of sophistication and effectiveness of our preventative measures and risk mitigation strategies based on the RAT severity classification outputs, thus facilitating the organisation's drive to meet our safety targets.
- 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 2017). In 2016, the same level was achieved for ATM Specific Occurrences.

3) Reporting of **Just Culture Implementation**.

- During 2012, the IAA commenced the development of a Just Culture process and procedures based on our published policy. This process was rolled out in Q4 2013, for implementation and application to ATM occurrence investigations from Q1 2014. The process is now fully embedded in the IAA's practices and is supported by all Staff Associations/Unions. The IAA ANSPs Just Culture policy and process was assessed as Best Practice (Level 'E') in the CANSO/ Eurocontrol Standard of Excellence maturity measurement in 2016.

2.3 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 attain a higher level of Safety Maturity for the ANSP and for providing the capability to meet RP 2 safety requirements. The USM function, since its inception in 2013, has been a significant contributory factor in the steady year on year measured safety maturity improvement. The USM function is now supported by the introduction of ATCO Team Safety Reps. 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 to provide the essential Safety Management support to the General Managers of the IAA's en-route and terminal business units.
- **The functional airspace block (FAB**) safety management 'harmonisation' strategy provides for wider FAB integration. The UK\IRL FAB's Safety Management Arrangements Document (SMAD), which was published in 2013, and more recently approved by the respective Competent Authorities defines this integration and harmonisation. The strategy includes the development of a Joint Just Culture Policy which was agreed and published in both ANSPs underpinning the Just Culture review processes. In addition, the joint "Day 2 Day" operational survey project has been completed in 2014 and 2015 for all units involving both ANSPs' interface units. This Joint FAB safety activity has generated joint reports complete with safety improvement recommendations, accepted and implemented as applicable to each unit. This has been replaced in 2016 with NOSS (Normal Operational Safety Surveys).

2.4 Safety Achievement Metrics

Safety data produced from the **IAA's Mandatory and Voluntary Occurrence Reporting** scheme enables analysis of our Performance Indicator (PI) safety trends. The SMU has implemented a Safety Data Analyst function with the employment of a specialist analyst that enables ongoing monitoring and detailed analysis of the ATM system performance.

2. ATM SAFETY (CONTINUED)

The trends are reported on in Monthly Unit performance dashboard reports in the Safety Performance Report (SPR), provided quarterly, containing analysis which is reviewed by the Operational ATM Safety Committee. These quarterly reports were consolidated in the National 2016 Annual Safety Performance Report.

The Monthly and SPR reports review our reporting levels, measurement and analysis of the **Safety Key Performance Indicators (SKPI's):**

- Separation minima infringement
- Runway incursions
- Unauthorised penetration of airspace
- Deviation from ATC clearance
- Level bust
- ATM Specific Occurrences. (Technical Events)

The predicted and actual events for 2016 in the PIs were within the overall tolerable variance of the target set by IAA Safety Regulation Division (SRD), with a continued positive improvement trend (reduction) in ATM contribution. Continued enhancements have been implemented, such as runway protection measures through the implementation of technical measures (upgrade of ASMGCS to Level 2) in addition to the IAA's proactive involvement in the Local Runway Safety Action Teams and DAOPG (Dublin Airport Operational Planning Group). Moreover, in areas where the ATM contribution is low, e.g. Level Busts and Deviation from ATC Clearance, there is ongoing dialogue with aircraft operators through the Stakeholder Safety Forum (SSF) to highlight these issues.

To enhance capabilities regarding the IAA's ATM Safety Strategy, "Plan, Do, Check, Act" Operational Safety Improvement process, the acquisition and full implementation of the APF (Aerospace Performance Factor) tool, has been in full utilisation during 2016. The tool is being utilised to more effectively monitor total ATM weighted performance and analyse trends, thus enabling efficient focus of our safety efforts and resources, in particular to monitor negative PI occurrence trends facilitating timely actions to reverse such trends. Interaction and dialogue is a key component of this process and the SMU conducts its twice yearly ANSP Stakeholder Safety Forum (SSF) with 12 local and international Airline Operators, Airport Authorities and the Irish Air Corps. This is a collaborative forum, for which the central activity is data sharing and Safety Performance reviews.

3. EFFICIENCY

3.1 **Traffic 2016**

The IAA uses EUROCONTROL forecasts, in addition to local economic knowledge, to forecast its traffic growth. This forecast estimated a growth in total IFR traffic for Europe of +4.0%, during 2016.

However, **2016 was a very positive year for Irish air traffic**, which saw **strong growth at all three State airports**. Combined traffic at Dublin, Shannon and Cork airports was up +8.2% in 2016, while total flights in Irish airspace were up +8.3%. Following very strong levels of traffic growth in 2015 and 2016, growth in 2017 is expected to be more moderate.

- Ireland's en-route traffic (flights that pass though Irish airspace but don't land) increased by 7.3% to 341,082 movements.

  Growth in this area was strong, with 2016 being the busiest year on record for IAA's en-route business. Q1 2016 and the summer months performed particularly well, mainly due to new routes from Irish airports and capacity increases on existing routes. Growth in the number of flights handled by our Shannon Centre exceeded 7% but our flexible operation ensured that during the year, there were no IAA attributable delays in Irish controlled airspace;

- The IAA's Aeronautical Communications service, based at Ballygirreen in Co. Clare, saw a 7.7% increase in traffic during 2016.

  More aircraft using the Tango routes to fly between destinations in the Canary Islands, North Africa, Southern Spain and Portugal, combined with increases in transatlantic traffic were responsible for this growth. Our Radio Officers efficiently handled over 850,000 messages from almost 477,000 aircraft during the year.

- On the domestic front, commercial traffic grew in 2016 at the three State airports, with a total of 246,816 movements:

  - Dublin Airport's commercial traffic grew by 8.5%.
  - Shannon Airport's commercial traffic grew by 2.3%.
  - Cork Airport's commercial traffic grew by 11.1%.

There were no IAA attributable delays at Dublin, Cork & Shannon airports during 2016. There were however increasing challenges at Dublin airport, where the strong growth levels experienced in 2015 continued into 2016. Dublin handled 207,520 movements in 2016 (+8.5%), which placed enormous pressure on airport infrastructure, leading to congestion at peak times. Our Operations Team at Dublin ATC reduced departure intervals from 1.5NM to 1.0NM in 2015. This has seen runway capacity increase to 35 departures per hour.

The IAA welcomed the strong growth in Irish air traffic figures for 2016 and is delighted to note that this sustained growth has continued into 2017, with Dublin airport now operating beyond 2008 levels.

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

3.2 **Staffing**

The average staffing in 2016 was 561 (excluding Safety Regulatory Division). The manpower planning strategy continues to focus on maximising flexibility and productivity while ensuring a cost efficient deployment of resources.

Recruitment continued across our frontline positions in 2016 including a further intake to our Student Air Traffic Controller Programme. In addition, the Authority continued to offer student internships to a small number of third level students in 2016.

3. EFFICIENCY (CONTINUED)

3.3 **Human Resource Policy**

2016 is the second year of a five-year collective agreement with IMPACT (2015 – 2019) which paves the way for industrial stability. New internal dispute resolution procedures have been introduced, which are effective in managing a stable industrial relations environment while ensuring continuity of service to our customers.

This development reinforces the commitment of management and staff to guarantee continuity of services to our customers through the timely management of workplace issues.

There continued a strong commitment to learning and development in 2016 through management development programmes and the launch of the iHealth Positive Matters employee wellbeing programme.

IAA received an award from the National Irish Safety Organisation in 2016, recognising its positive and proactive culture in relation to occupational safety management.

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 reported no air traffic management attributable delays in 2016 at Cork, Dublin and Shannon airports.

- Airport slot adherence statistics also demonstrate a performance level well above the EU standard.

In addition, the 2016 publication by EUROCONTROL of the ACE (ATM Cost-Effectiveness) report, confirmed that:

- The IAA's gate-to-gate financial cost effectiveness was reported as €312 per flight hour compared to a European average of €427.
- The IAA's air traffic controllers (ATCOs) productivity is in excess of 30% higher than the European average. ATCO-hour productivity measures the efficiency with which an Air Navigation Service Provider (ANSP) deploys and makes use of its ATCOs.

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

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

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

In 2015 (latest year of full independent comparison – source Eurocontrol Performance Review Report 2016, published June 2017), IAA overflight charges were again amongst the lowest in Europe. The IAA en-route charge was 49% lower than the average unit rate for all states in Europe. The IAA has consistently maintained one of the lowest en-route user charge unit rates, making Irish airspace economically attractive to airspace users. Similarly, Terminal charges at Irish airports remain within the cheapest quartile of European States and are almost 15% lower than the European average (2015 data).

6.1 Estimated Commercial Rates

The IAA is responsible for the provision of safe, efficient and cost effective air navigation services in Irish-controlled airspace. The costs of providing these services and facilities are funded by charges levied on airspace users.

6.1.1 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 2016 was €29.67. The submission to the NSA assumed chargeable en-route determined costs for 2016 of €121,386,700 and chargeable service units (CSUs) of 4,049,624. The actual outturn for 2016 was as follows:

	En-route Costs (Incl. MET)	Chargeable Service units
Actual outturn	€108,670,638	4,467,595
Forecast figure (NSA Submission)	€121,386,700	4,049,624
Variance	-€12,716,062	+417,971
Variance in %	-10.5%	+10.3%

6. COST EFFECTIVENESS (CONTINUED)

The enroute and terminal cost bases were lower than forecast, due to exceptional cost containment measures, resulting in lower headcount, lower operating expenses and depreciation costs than forecast.

6.1.2 **Terminal 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 2016 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 2016 was €180.18. The actual outturn for 2016 was as follows:

	Terminal Costs (Incl. MET)	Terminal Service units
Actual outturn	€23,207,720	163,305
Forecast figure (NSA Submission)	€25,787,100	144,400
Variance	-€2,579,380	18,905
Variance in %	-10.0%	+13.0%

7. CAPACITY & EFFICIENCY

The Operations directorate, together with the Technology directorate, 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 a safe and efficient service provide 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:

- Shannon ACC is a very complex airspace block; the IAA uses dynamic sectorisation within it's free route airspace, 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.

  A review of a number of these building blocks was carried out over the winter period 2015/2016. As a result of this review Shannon En Route made a number of changes including a change to the DFL (Divisional Flight Level) to the sectors to best meet our customers' demands. These changes were looked at, not only in the context of current traffic demands, but also looking ahead to changes on the North Atlantic. This method, along with the expansion of CPDLC for FANS aircraft and the addition of ATN CPDLC, allows Shannon to ensure Irish airspace is used as efficiently as possible and allows for increased demand.

- Dublin ACC exceeded its capacity plan in 2016, with an 8.7% increase in runway movements compared to the previous year. Operational efficiency measures enabled this performance, providing for a highly flexible and efficient approach to opening and closing sectors to meet demand.

- During 2016 the IAA continued work on a large-scale demonstration, in conjunction with the SESAR JU, to develop the concept of operations for the remote provision of ATC services at two airports simultaneously. Trials were completed successfully, using SAAB engineered remote tower technology to provide air traffic control services for Cork and Shannon airports from Dublin.

- In 2015, the distance between departures from Dublin Airport was reduced to 1 NM (from 1.5NM), leading to an average reduction in the departure interval of 12 seconds per flight. This has increased the capacity of the runway and facilitated the availability of additional slots in the summer 2016 season.

8. DELAYS

Irish ATFM delays recorded by the Network Manager for 2016, amounted to only 19,730 minutes and were **primarily attributable to the weather, with no ATM contribution**.

Irish delays account for just 0.1% of total European delays

9. ENVIRONMENT

The IAA is committed to minimising the environmental impact caused by the provision of air navigation services in Irish controlled airspace. In support of its Environmental Policy, which was reviewed in 2016, the IAA shall:

- Aim 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.

In 2016 the IAA developed its Environmental Management Plan, which 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 Single European Sky (SES) Performance Scheme are met. The key performance indicator in this area is for Horizonal En-Route Flight Efficiency. In 2016, IAA comfortably met its FAB target of 3.27%, with an actual score of 1.40%.
- Through the ENSURE (En-Route Shannon Upper Airspace Re-Design) Project, Ireland became one of the first countries in Europe to implement free-route airspace. Efficient airspace design leads to shorter flying distances, which in turn reduces fuel burn and CO_2 emissions.
- Continuing to implement and develop innovative procedures and technology, such as Point Merge, Precision RNAV, and Enhanced Reduced Departure Intervals. These projects offer environmental benefits such as reductions in fuel burn, CO_2 emissions and noise pollution.
- Engineering initiatives undertaken in Dublin and Shannon, including the installation of energy efficient LED backlights to the main controller screens.

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 is being 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 objective of the Authority's Technology directorate is to develop and deliver the IAA's technology strategy. The IAA technology strategy is reviewed on an annual basis, to ensure it continues to meet the IAA' operational requirements and its obligations under the SES legislation. The IAA current technology strategy covers the period 2017-2021.

The methodology used in compiling the 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 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.

Operational requirements are the 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. The most significant developments in Operations and Infrastructure during 2015/16 were as follows:

- **COOPANS Development**: The COOPANS system remains at the forefront of European ATM system developments. In 2016, the COOPANS partners went live with the COOPANS B3.1 software build, and planning is underway for the introduction of B3.2 in January 2017. B3.1 introduced the next generation Thales safety nets component, which offers an improved performance over the existing safety nets product. The main operational benefit is a reduction in the number of spurious alerts through additional tuning capabilities, and improvement performance in approach environments. The COOPANS partners have revised 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.
- **SESAR Remote Tower Trials**: The IAA successfully demonstrated the use of remote tower technology in a multi tower environment. The trial involved the control of Shannon and Cork towers from Dublin.
- **XMAN Cross Border Arrivals Management:** IAA worked closely with NATS in the UK on a project to reduce aircraft holding times at Heathrow Airport. 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 will be implemented in 2017.

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

- **The new CEROC (Contingency En Route Operations Centre):** The finished building was handed over to technology for systems commissioning in December 2015, the system installation is ongoing. The site acceptance tests for the COOPANS platform and the Radio Backup System (RBS) have been completed. 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 ANSP's 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):** The use of Electronic Flight Strips will replace the existing paper strips environment in the IAA's operational control towers. Validation testing is ongoing with the system supplier SAAB, with a view to completing the tower installation in early 2017.

Our COOPANS system continues to be on the **leading edge of ATM systems in Europe** and is the only harmonised system of its kind, implemented in 5 ANSPs.

11. INNOVATION IN OPERATIONS AND INFRASTRUCTURE

The IAA is one of the partners involved in Aireon; a $400 million cutting edge technological partnership, including Iridium (USA) and a number of air navigation service providers such as NAV CANADA (Canada), ENAV (Italy) and Naviair (Denmark). Aireon will establish global space based ADS-B coverage by including ADS-B receivers on the new Iridium NEXT satellite constellation.

It's a **Revolution in Global Air Traffic Surveillance**

The objective of the system is to provide surveillance coverage in remote and oceanic areas, where there currently is no surveillance service. It will provide coverage that is commensurate with 15 NM separation.

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 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 is currently working on Collision Risk Modelling and implementation requirements for NAT ANSPs. The initiative is likely to lead to the eventual demise of HF voice communications. This will require IAA to engage with the UK on the issue of joint service provision in the North Atlantic.

Creates **Airspace Flexibility, Reduces Fuel Costs** and **Increases Safety**

The IAA in partnership with NAVIAIR and ENAV have already conducted a detailed technical review of the system and its capability and have concluded that the proposed technical solution is viable.

The simulations and studies conducted to date indicate that the system design is capable of meeting the required operational requirements.

To date the analysis has been conducted in regions where higher levels of traffic and interference are anticipated, for example on the East Coast of the United States. The design demonstrates that the system is capable of working in such difficult environments.

The hosted payload has the capability of processing in excess of 10,000 tracks on a worldwide basis. The design solution demonstrates a high level of system redundancy.

- All of the ground processing elements and down link portal are fully redundant.
- 72 Satellites will be placed in orbit, giving 6 spare satellites which can be moved into position in a period of 10-14 days to cover a failed satellite.
- Overlapping satellite coverage. The satellites are placed in 6 orbital planes, which transit the North and South Poles. As the satellites converge on the poles , their respective ADS-B coverage footprints overlap, resulting in multiple levels of overlapping satellite ADS-B coverage. As a consequence single satellite failures would have no impact on coverage in higher latitudes, where the majority of North Atlantic traffic is routed. A single satellite outage would manifest as an area of no coverage lasting for a maximum of 9 minutes in equatorial regions where overlapping coverage is at a minimum.

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 ARTAS tracker and COOPANS system at CEROC and is currently being evaluated. Aireon are working with EASA to ensure EU certification prior to the constellation becoming operational in 2018.

When the system becomes operational in 2018, IAA will provide the Aireon Aircraft Locating and Emergency Response Tracking (ALERT) service from the North Atlantic Communications Centre at Ballygirreen. This will be the aviation industry's first and only free, real-time emergency aircraft location service, providing crucial information to ANSPs, aircraft operators, regulators and search and rescue personnel.

A Breakthrough in Aviation Safety

12. CUSTOMER CONSULTATION PROCESS

Our Annual Customer Care Programme is a Key Consultation Tool with our Customers

During 2016, 33 Programme Partners were visited with 33 CRM surveys completed

During the year, the Customer Care Team received 372 individual requests from our Customers

Our Response Rate was 91% of Customer Requests closed in 24 hours

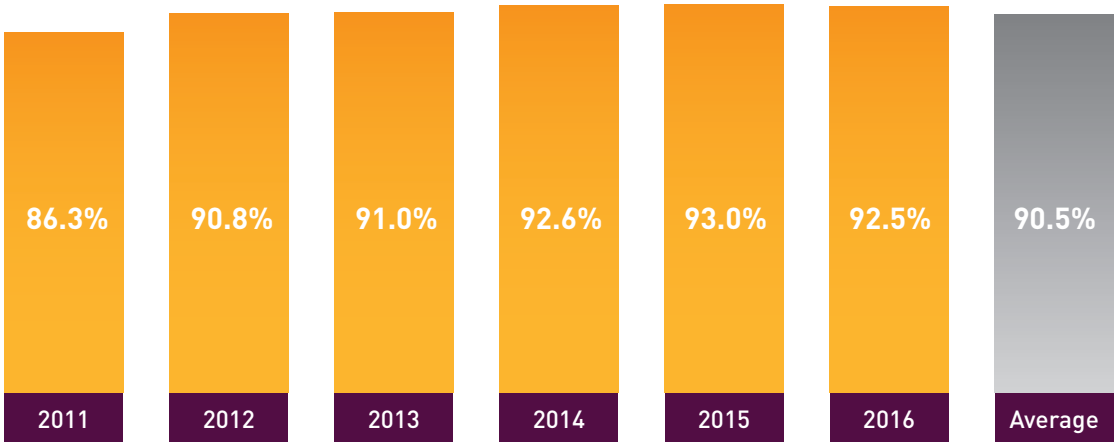
The IAA has again commissioned the independent organisation, Schuman Associates based in Brussels, to conduct a Customer survey for 2016. Using their web based customer relationship model, Schuman contacted our customers directly and asked them to complete an online scorecard/questionnaire.

Customers were asked to rank the IAA across a number of relevant areas and encouraged to complete a "free format" section which recorded comments, concerns, questions and suggestions. There was a 100% response rate to these surveys. Schuman collected the data from the survey responses and compiled a series of reports for the IAA.

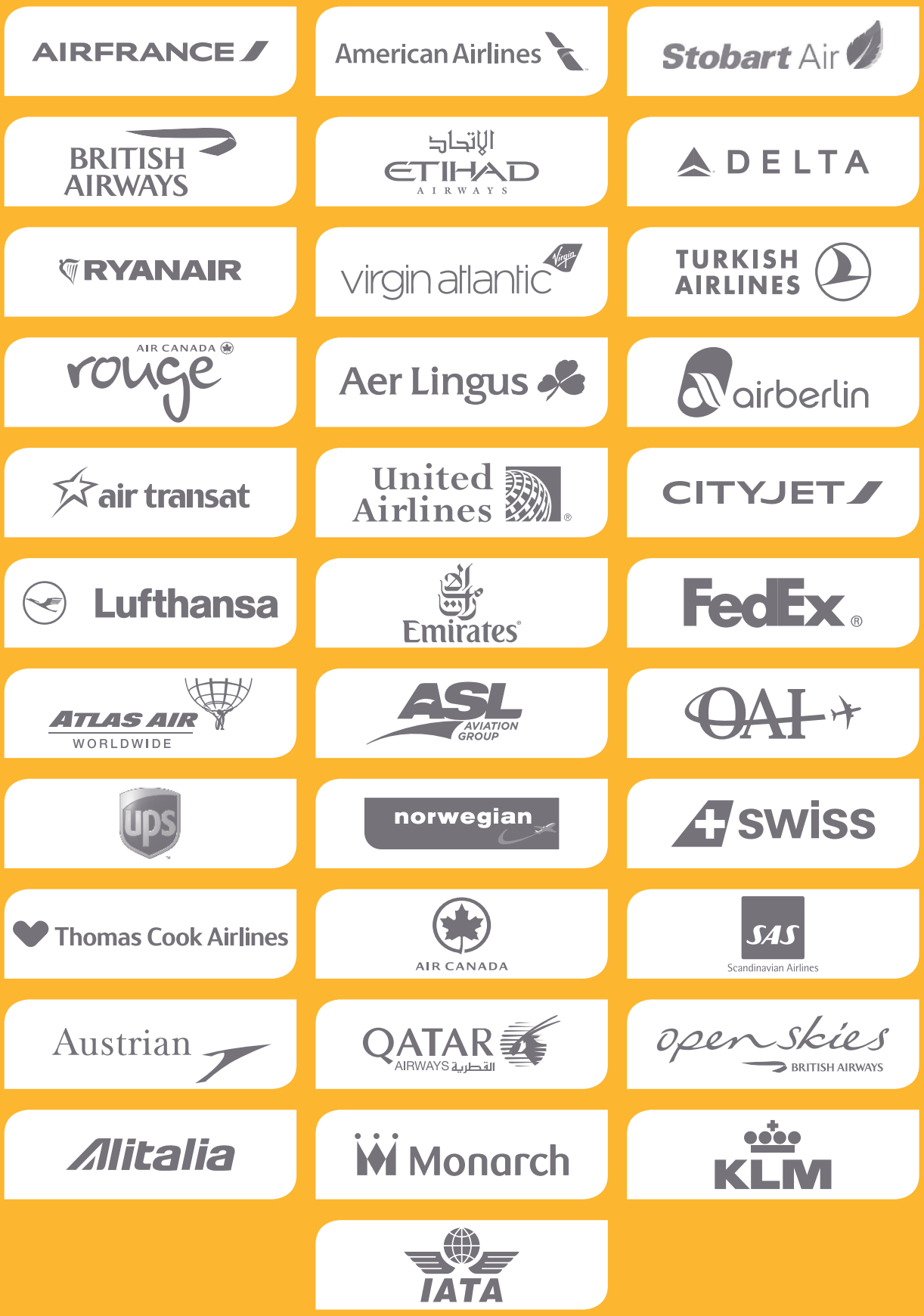
The results of this independent survey show that overall customer satisfaction in 2016 is at 92.5%, which is marginally down on the 2015 score of 92.95%.

This performance is reflective of the IAA's consistently low user charges, lack of air traffic delays, a highly efficient Free Route Airspace, high levels of customer engagement and our continued support to the commercial aviation industry.

TREND OF CUSTOMER SATISFACTION



IAA CUSTOMER PROGRAMME PARTNERS



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

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

D

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

F

FAB	Functional Airspace Block
FANS	Future Air Navigation System

H

HF	High Frequency

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 Protocols

X

XMAN	Cross Border Arrival Management

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