



**Irish Aviation Authority**  
**Air Navigation Service Provider**  
**Business Plan 2020-2024**

**Submitted to the**  
**National Supervisory Authority**  
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## Foreword by Billy Hann, Director of ATM Operations & Strategy

This Business Plan has been developed at a time when Ireland's terminal and en route traffic has reached significant highs following unprecedented growth during the current reference period, RP2.

It also coincides with some notable achievements including the completion of the new 86.9 metre air traffic control tower at Dublin Airport – one of the tallest structures in Ireland – which is required to facilitate parallel runway operations at Dublin Airport from 2021.

By continuing to invest in our state-of-the-art air traffic management system and in the development of our staff, we are well placed to continue to deliver a world class service to the highest standards.

Accordingly, this Plan identifies requirements during the next reference period, RP3, that will ensure the continuation of a safe service whilst ensuring sufficient capacity to maintain customers satisfaction with the overall service that we provide.

From a national perspective, the State has managed to adhere to all of the national (FAB) targets set by the European Commission during RP2 to date.

This significant contribution to the Single European Sky is something that I am very proud of following an immense collective effort.

Safety will always be the number one priority but there is also an important focus on ensuring that our customers remain satisfied with zero delays and competitive charges. We are confident that we can continue to deliver an excellent quality of service throughout the next reference period, whilst maintaining favourable charges.

Forecasting the future needs of the business is inherently challenging but particularly so for RP3 given the uncertainty posed by Brexit and the impact that the UK's impending withdrawal will have on traffic.

Following careful consideration, we have relied on the European Commission's preferred base-case scenario for this Plan, which is premised on a hard Brexit scenario being avoided and we will continue to closely monitor developments in this regard.

Notwithstanding the Brexit-related risks, it is very encouraging that further growth is expected across terminal and en route traffic during RP3.

The overall favourable macroeconomic outlook in addition to short-term reactionary measures introduced in RP2 to cater for demand are key pillars of this Plan.

With ATM related delays set to increase across Europe during RP3, we have ensured that this Plan positions the business on a sustainable footing with a continuation of minimal delays and charges that are amongst the lowest in Europe.

The industry has benefitted greatly from the flexibility that has enabled us to redeploy resources away from necessary capital projects towards core operations to deal with the unprecedented levels of demand.

Whilst it is regrettable that certain capital initiatives were deferred, I am pleased to say that any capital expenditure allowance that has not been utilised will be returned in full to our customers during the next reference period. This will have a significantly beneficial impact on both en route and terminal charges in 2020 and 2021.

Despite an uncertain future for the Functional Airspace Block, it is

encouraging that the IAA continues to engage in multiple cross border initiatives and partnerships. Such collaboration will continue to ensure value for money and maximise efficiencies over the course of this Plan and beyond. For example, we continue to advance our air traffic control system through the COOPANS partnership and separately, the intensive training programme developed by EPNI will minimise any lag associated with deploying new air traffic controllers.

The transition from RP2 to RP3 next year is particularly unique in Ireland due to the Government mandated separation of the IAA's Air Navigation Services Provider and the IAA's Safety Regulation Division, which is expected to be complete at the beginning of RP3. This will require the ANSP to create a brand new identity and relocate its headquarters with inevitable transitional costs associated with this restructure.

On behalf of the team at IAA, we look forward to further consultations with our stakeholders over the coming months and welcome the opportunity for continued engagement with the European Commission and the Performance Review Body.

**Billy Hann, Director**



## Executive Summary

### IAA ANSP

Ireland as an island nation with a competitive, open economy relies heavily on aviation for economic and social development and will continue to do so throughout the third reference period 2020-2024 (RP3) of the EC Single European Sky (SES) and beyond. The Irish Aviation Authority's (IAA) Air Navigation Service Provider plays a critical role in ensuring that aeronautical traffic in Irish airspace, and under its remit at Irish airports, is managed in a safe and efficient manner, in line with Irish national, European and international requirements and targets.

Safety will always be the IAA's No. 1 priority, and this is reflected in this Business Plan. The IAA is already ranked as one of the top European States for the Effectiveness of Safety Management. This has been achieved through significant investment in people, processes, technology and an open culture over the first and second reference periods (RP1 and RP2). Further investment is proposed in order to continue to deliver the highest safety standards in RP3 while air traffic levels increase. In addition, we continue to place a high emphasis on service excellence and have excelled in this space in recent years – despite faster than expected traffic growth over the course of RP2 – with zero en route delays over most of RP2 and overall satisfied customers. Further investment is required in RP3 to continue to excel in these areas.

With less than one year remaining in the five-year regulatory period RP2 (2015-2019), the IAA ANSP has achieved all of the National (FAB) targets on a standalone basis across the key areas of safety, environment, capacity and cost efficiency. However, as traffic across RP2 significantly exceeded all forecasts, key decisions had to be made to prioritise operational safety and service quality ahead of capital project delivery. Performance targets were achieved only at the expense of diverting resources from planned capital projects to core operations and by ensuring that sufficient frontline staff were available at the expense of capital investment. However, these were short-term measures that cannot be sustained into RP3 such as a heavy reliance on overtime and considerable volumes of annual leave being deferred.

During RP2, we also needed to make a major change on our capital plan in order to progress with the new IAA tower at Dublin Airport, which was fast-tracked due to the unprecedented growth in traffic and the decision of the DAA (Dublin Airport Authority) to

proceed with the development of a new parallel runway to the north of the airport campus. This requirement to construct a new visual control tower was not forecast when RP2 was being planned. The construction of the Dublin Visual Control Tower reached substantial completion in March 2019 and will ensure that the IAA can facilitate parallel runway operations at Dublin Airport, growing capacity at Dublin airport, with amongst the most modern air traffic management facilities in Europe. Consequently, certain foreseen capital projects (particularly related to system upgrades and replacements due to impending obsolescence) had to be postponed. It is imperative that this backlog of capital projects be implemented in the early part of RP3.

### **Customer Engagement**

The IAA runs an industry leading Customer Care Programme, which interviews and surveys our customers on the quality of our service and their expectations/ requirements on an annual basis. Full results from each year of RP2 to date are available. We are currently engaging with customers on our 2019 programme. We met with a representative sample of our Customers (35 in 2018) across Europe, North America and the Middle East, which represent the most important markets for the IAA. These airlines cover all the major passenger and freight business models, from Low Cost Carriers to Full Service Airlines.

In 2018, as part of this engagement, we commissioned Schuman Associates, a Brussels based consultancy, to conduct an online Customer Satisfaction survey on our behalf. The group surveyed are responsible for approximately 88% of flights in Irish airspace and the results demonstrated an overall level of Customer satisfaction with the IAA standing at 92.3%.

Our customers prioritised efficient airspace, low delay, operational resilience, low user charges and strong customer relationships. The IAA Business Plan is focussed on delivering on these key customer priorities. We will prioritise safety, operational efficiency and cost effectiveness whilst also ensuring appropriate investment in our technology, people and processes to position the IAA for the future.

### **Projected Traffic**

The projected en route traffic for the five-year period 2020-2024 is a key input into ANSP Business Plans for RP3. It is an important consideration that impacts capacity considerations such as staffing requirements and training needs, rostering/ flexibility and it has an important bearing on the en route charges that prevail in each year.

En route traffic in Ireland is primarily influenced by the long-haul transatlantic routes rather than the European “point-to-point” traffic. This traffic is influenced heavily by oil prices and by the health of the US and global economies. The UK economy is also particularly important with up to one-third of Irish en route traffic coming from or travelling to destinations in the UK. Accordingly, the impact of Brexit is a major element of uncertainty for both en route and terminal traffic levels.

For this Business Plan we consider that the higher than expected growth in traffic during RP2 is unlikely to be sustained, or repeated, during RP3. There are a number of factors that suggest more modest growth rates including the slowdown in economic growth of major economies, higher oil prices, growth in economic protectionism (in particular in US), and two major risk factors; a continuing constrained environment at Dublin airport if planned infrastructure investments are not delivered, and Brexit related uncertainty.

Considering the elements above IAA has chosen to use the EUROCONTROL Statistics and Forecasting Services Base Case Scenario in line with the EC advice/ EC decision.

### **Safety – Air Traffic Management**

Our core objective is to deliver a safe Air Traffic Management service for our airline customers and travelling passengers – in line with this objective we are committed to continuous safety improvement. In terms of our performance on ATM Safety to date, the CANSO/EUROCONTROL ‘Standard of Excellence’ safety maturity measure assessed globally has recently placed the IAA’s performance at the top of 44 participating ANSPs.

During RP3, we will continue to comply with the Union-wide targets by ensuring Effectiveness of Safety that is at least “Level D” in the objective of safety risk management and at least “Level C” in the other safety objectives including culture, policy, promotion and assurance. We will achieve this by building on our current ATM Safety Strategy and further developing the four key thematic aspects of this strategy, including (1) People Create Safety, (2) Safety Intelligence, (3) Tailored & Proportionate and (4) Challenging & Learning.

### **Environment**

This Business Plan will ensure that we are well placed to meet the environment targets that have been set by the European Commission whereby the average horizontal en route flight efficiency of the actual trajectory (measured by average additional distance flown compared to the great circle distance) shall not exceed 2.53% in 2020, 2.47% in 2021, and 2.40% in 2022, 2023 and 2024.

The IAA is also conscious of its corporate responsibility to environmental protection and the EC's wider commitments to carbon reduction. Accordingly, appropriate investment provisions have been made in this Business Plan to upgrade our energy management systems, improve carbon emissions and environmental sustainability.

### **Capacity**

The IAA has a track record of excellent performance with regard to the provision and management of airspace capacity. This has not happened by chance; we have made investments in modern air traffic management systems (COOPANS), developed innovative staffing management solutions (single person operations, flexible rostering) and implemented innovative traffic management solutions (Free Route Airspace, Point Merge, High Intensity Runway Operations). Staff productivity has also been a consistent excellent contributor to capacity.

During RP2 unprecedented traffic levels were handled by IAA staff with no en route capacity delays. However, this was achieved by prioritising service delivery and a range of short-term staffing solutions (overtime, leave-deferral, etc.). Both national and EU staff related regulations that have been implemented during RP2 and that will continue in RP3 will not only severely restrict the use of short-term staffing solutions but will also require additional staff to comply with requirements such as paternity leave.

It is shown that the short-term efficiencies are putting significant strain on operational resources according to the IAA's internal management metrics and that this factor, coupled with delays to necessary capital projects and difficulty in staffing projects, will contribute to flight delays if the necessary staffing increases are not provided for. RP3 represents an appropriate time to safeguard the sustainability of the business whilst also continuing to prioritise safety and quality of service.

This Plan therefore reflects the need for modest increases in the number of Air Traffic Controllers and Engineers, and we will ensure that the necessary training programmes are in place to facilitate this. This Plan also sets out the infrastructure requirements that will enhance capacity on our network in addition to technological improvements. These investments in staff and technology are needed over the course of RP3 in order to both fully "catch-up" with traffic growth from RP2, meet further traffic growth and meet new national and European regulatory and legislative requirements.

### Cost Efficiency

The IAA’s track record and robust financial performance in RP2 to date can be attributed to unprecedented levels of traffic that have been managed without delay in addition to actual costs being lower than planned costs. However, this Business Plan demonstrates that it is not possible to sustain these efficiencies in RP3, without having an adverse impact on ATM capacity and the delivery of required technology projects.

The IAA’s business plan proposes an average en route DUC of €30.90 (2017 prices) and an average terminal DUC of €197.95 over the course of RP3, which includes the €65.3m cost associated with the structural reform. Without the government mandated structural reform, the average en route DUC (2017 prices), including all other State costs, would remain considerably below €30.

### Unspent Capex being returned

As of end 2018, there was €17.9m of capital-related costs (depreciation and cost of capital) that the IAA had not utilised since the beginning of the performance scheme. This is split between en route (€13.5m) and terminal (€4.4m). The IAA has committed to returning the unspent €17.9m to the airspace users in 2020. In addition to this, we expect that a further €6.7m of unused capital-related costs will materialise in 2019, with €4.3m attributable to en route and €2.4m attributable to terminal. The IAA is committed to returning this amount to the airspace users in 2021.

The proposed impact on the en route and terminal unit rates is as follows:

	Reduction in unit rate	
	2020	2021
En Route	€ 2.84	€ 0.91
Terminal	€22.99	€12.10

ANSPs are not required to return unspent Capex during RP2 – with the regulations changing for any unspent Capex during RP3 – but the IAA has nonetheless decided to return this unspent allowance as a measure of good faith.

### COOPANS incentive payment being returned

As a new member of COOPANS, NAV Portugal agreed to make an Incentive Contribution to the existing COOPANS members relating to builds developed prior to date on which it joined COOPANS. The IAA’s share of this incentive payment is €■m, payable over the

period 2018 – 2021. As a measure of good faith, the IAA proposes to pass on this incentive payment in full to the airspace users in the following manner:

	Reduction in unit rate		
	2020	2021	2022
En Route	€■	€■	€■
Terminal	€■	€■	€■

### EU Grant Funding / Public monies

To date, in RP2, the IAA has returned €4.7m in EU grants monies received, of which €3.2m relates to en route and €1.5m relates to terminal. The IAA will continue to apply for EU funding with a view to reducing actual customer charges throughout RP3.

### Unknown Costs during RP3

The IAA will incur certain costs during RP3 that are unknown, or which simply cannot be anticipated at this point in time. For example, during RP2 we underestimated the resource implications of Regulation (EU) 2015/340 in the areas of training course preparation, instructor provision and the regulatory training process. The IAA can confirm that it has not included an allowance for unknown costs during RP3.

### Cross Border Initiatives

Owing to the UK set to leave the EU, there is some uncertainty surrounding the future of the UK-Ireland Functional Airspace Block (FAB), which explains why Ireland is submitting a national performance plan for RP3. Notwithstanding this, the IAA is undertaking a number of cross border initiatives that achieve efficiencies and are innovative. These include COOPANS, Entry Point North and Borealis.

- COOPANS is an international partnership that includes the IAA and ANSPs from five other countries (Austria, Croatia, Denmark, Portugal and Sweden). The ANSPs act as one organisation and the system supplier is Thales. There are benefits from sharing know-how in the form of common tools, methods and operational procedures throughout the system life cycle whereas financial benefits arise from common procurement for development, integration, deployment and maintenance.
- Entry Point North is one of the largest global ATS training academies that offers a wide portfolio of services to aspiring and operational air traffic controllers, air traffic service officers, air traffic safety electronics personnel, administrative personnel

and other aviation related personnel. It has locations in Ireland, Sweden, Hungary, Denmark, Spain and Belgium.

- Borealis is an alliance of ANSPs from Ireland, Denmark, Estonia, Finland, Iceland, Latvia, Norway, Sweden and the UK. Borealis Alliance focuses on strategic business cooperation between the member ANSPs, seeking economies of scale and projects that can be achieved on a commercial basis, complementing the work of the northern European FABs, but without the need for regulatory or State involvement. The alliance is also an important enabler of joint initiatives to improve flight efficiency and reduce environmental impact, delivered across the whole area.

### **Non-ANSP Costs 2020-2024**

There are a number of other non-ANSP factors that influence the final unit rates for both en route and terminal. These include costs associated with the network manager EUROCONTROL and Met. Furthermore, the structural reform of the IAA and associated separation will incur transitional costs that will impact the charges during RP3 – the ANSP will, for example, have to relocate to a new premises and whilst the Plan reflects this, the other costs are largely beyond the scope of this Plan but are included in the National Performance Plan, which will be the subject of industry consultation over the coming months.

### **Beyond 2024**

Successful long-term planning requires necessary investment in RP3 across a broad range of areas including Technology (e.g. contingency), Operations (e.g. adequate training and new recruits), IT and Property & Security – with these requirements detailed in this Plan. In other words, we have been mindful of RP4 requirements when developing this Business Plan for RP3 and have ensured that we will be well placed to meet future targets in the areas of safety, environment, capacity and cost efficiency.

In developing this Plan, we have also given due consideration to the localised issues and relevant interdependencies between the various Union-wide targets. Consequently, we believe that this Plan is required to deliver the priorities of our customers, which will continue to support the wider economy.

## 1 Background and Introduction

### European Perspective

Capacity related delays have been an issue on the European network as it struggles to accommodate the rapid increase in traffic, with this trend set to continue into RP3. The latest EUROCONTROL figures indicate that approximately 334 million travellers were affected by delays and flight cancellations in 2018, resulting in an estimated €17.6 billion cost to the EU economy.

In 2018, every fifth flight in Europe was late and the European network generated a total of 19.1 million minutes of en route delay – up 105% on 2017 compared to 3.8% traffic growth. The average en route delay per flight for 2018 was 1.73 minutes compared with the EU-wide performance target of 0.5 minutes. Against this backdrop, there is an ongoing debate about the appropriate evolution of the European airspace architecture to accommodate long term growth, but this is largely outside the scope of this paper.

Despite the capacity issues on the European network, Ireland has met all of the capacity targets during RP2 to date with near zero delays. Furthermore, this Plan is designed to ensure that Ireland meets the Union-wide capacity targets during RP3 (see Figure 2 overleaf).

### The IAA ANSP Business Plan for RP3

This Business Plan is a key consideration in establishing a national performance plan over the five-year period 2020-2024. Whereas the IAA's Business Plan was developed on the basis of the Ireland-UK Functional Airspace Block ('FAB') during the second reference period 2015-2019 ('RP2'), it is now prudent to develop a national plan for RP3 given the uncertainty associated with the UK's intended withdrawal from the European Union.

This Business Plan is intended to inform and assist the National Supervisory Authority ('NSA') in drafting a performance plan for submission to the European Commission ('the Commission') for the Commission's own assessment and review ahead of the implementation of the third Reference Period ('RP3').

This Plan sets out how the IAA intends to make an overall fair, proportionate and realistic contribution to the achievement of the Commission's Union-wide performance targets for RP3. In doing so, the IAA Air Navigation Service Provider ('ANSP') will continue to build



on its strong performance in RP1 and RP2 to date; with excellence in safety and service delivery across the areas of delay avoidance and en route flight efficiency, historically low user charges and a low-cost position relative to the Union-wide average.

This Business Plan details costs that are eligible under the performance and charging scheme including staff costs, operating costs other than staff costs, depreciation costs, cost of capital and exceptional costs. As such, it details the actual and projected costs of new and existing investments and ensures consistency with SESAR deployment and expected performance gains. This approach ultimately ensures full transparency with respect to the cost base for charges, actual costs and unit rates, as required by the Commission.

The IAA formally engaged with the European Commission's Single European Sky ('SES') Unit in February 2018 and took the opportunity to signal the upward pressures on our projected costs ahead of RP3. The feedback from the SES Unit was clear in specifying that any cost requirements must be fully justified. In this regard, the Irish ANSP welcomes the acknowledgement in paragraph 18 of the Commission's Draft Implementing Regulation 903/2019, which implies that certain ANSPs may not be in a position to achieve further cost efficiency improvements by virtue of recognising that "*...most air navigation service providers can achieve further cost efficiency improvements in RP3...*".

One of the key aspects of this Plan is that the IAA is faced with an inevitable increase in costs in order to continue to best serve our customers and position itself to meet the respective performance targets on safety, environment and capacity. A key factor driving this cost requirement is the STATFOR Scenarios from February 2019, which have influenced our chosen scenario for Ireland (i.e. base scenario), while acknowledging the potential risk to growth associated with the United Kingdom withdrawing from the EU.

The IAA has consistently had one of the lowest unit rates in Europe and has contributed significantly over RP1 and RP2 to the achievement of union-wide cost efficiency targets. The IAA will continue to contribute over the course of RP3 by having a unit rate that is on average approximately 20% lower than union-wide target identified by the PRB in its "Advice to the Commission in the setting of Union-wide performance targets for RP3" dated 30 September 2018. However, there is a need for an overall cost increase for the IAA for the period 2020 – 2024 and accordingly, the Irish ANSP will not be in a position to fully adhere to the Union-wide cost targets to the extent that it has in the previous reference periods.

Should the Commission find that these proposals are adequate and that our costs are justified following its own assessment, the National Supervisory Authority will adopt and publish the final version of the national performance plan to apply from 1 January 2020, or at a later date in 2020 to apply retroactively from 1 January.

### **Structural Changes**

During the second reference period, the Government signalled its intention to separate the two main functions of the IAA – safety/security regulation and air traffic services – to create two new legally separate entities. It is anticipated that this separation will be implemented early in the third reference period with the optimal funding structure of the new Regulator, which will also include the economic regulator, subject to consultation in 2019.

Owing to the significant structural change that has been planned and the current uncertainty surrounding aspects of that structural change (final costs, funding for new regulator, loss of efficiency associated with current structures), this Business Plan has been prepared on the basis that there will be additional costs associated with the project for the ANSP, most significantly the securing and development of a new headquarters office accommodation during RP3, as well as lost economies of scale.

We are of the view that this approach is necessary to ensure the existing functions of the IAA continue to achieve high quality performance outcomes across both regulatory and air traffic services. The annual consultations, required as part of RP3, will represent an appropriate means of adjusting future targets, should it be appropriate to do so, when the final detail of the overall cost of the structural change process is known, as well as where those costs are apportioned.

### **The impact of Brexit**

With respect to the United Kingdom's decision to leave the EU, it is not yet clear what form Brexit will take or the impact that it will have on our business in the short to medium term. Given that STATFOR "*have included the possibility of a hard Brexit to happen in the Low scenario: i.e. no deal Brexit*" we assessed the need to deviate from the Base STATFOR scenario. STATFOR has included a "hard BREXIT" effect in its low scenario but this is still an area of great uncertainty. Indeed, traffic growth from Q1 2019 has not indicated any "BREXIT effect". IAA has therefore chosen to use the STATFOR base scenario in line with the general advice of the EC, while acknowledging the uncertainty surrounding BREXIT.

## 2 Regulatory Framework for RP3: Union-wide Performance Targets

The Commission's Implementing Regulation (EU) 2019/317 of 11 February 2019 sets out a performance and charging scheme in the single European sky for the third reference period ('RP3'). This Regulation repeals the Implementing Regulations 390/2013 and 391/2013, which applied to the second reference period 2015-2019 ('RP2'), and it consolidates the provisions of an adapted regulatory framework into a single Implementing Regulation (2019/317).

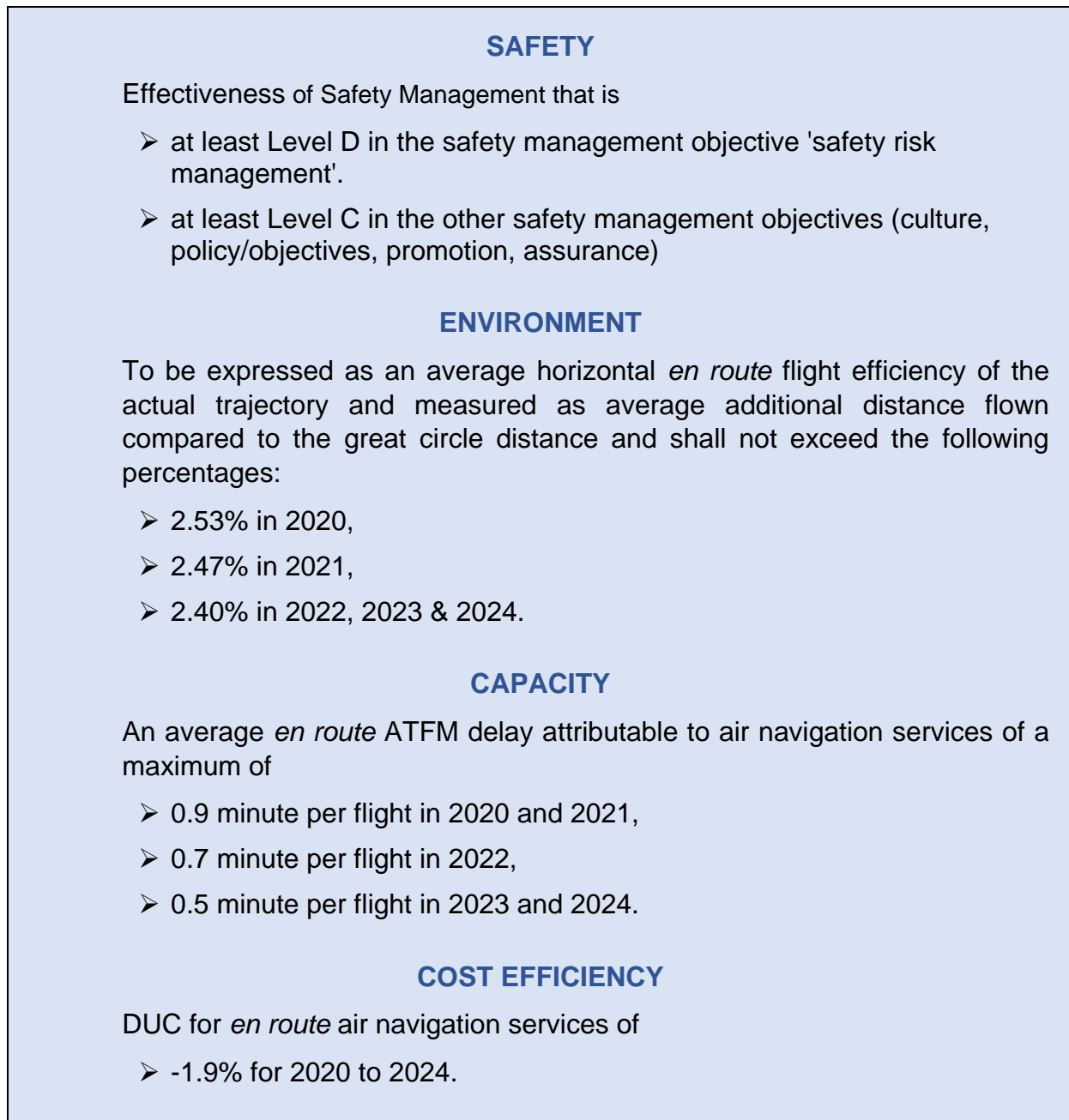
For the next performance and charging scheme, the Commission has sought to enhance the performance of air navigation services while having regard to safety, environment and capacity-related objectives. In doing so, the Commission has set Union-wide performance targets in the areas of safety, environment, capacity and cost efficiency having thus far considered the performance in the first three years of RP2 (2015-2017) in addition to inputs from other stakeholders (ANSPs, NSA's, Performance Review Body ('PRB')).

The Union-wide performance targets are set out below as per Commission Implementing Decision (903/2019) "*setting out the Union-wide performance targets for the air traffic management network for the third reference period starting on 1 January 2020 and ending on 31 December 2024*":

The Union-wide targets are set for each Key Performance Area (KPA) in the performance scheme, as outlined in Section I of the Annex of the regulation:

- **Safety:** Effectiveness of Safety Management (EoSM) for ANSPs;
- **Environment:** Horizontal flight efficiency of actual trajectory flown;
- **Capacity:** En route ATFM delay per flight attributable to ANS;
- **Cost-efficiency:** Year-on-year change of Union-wide DUC for en route ANS.

Performance Indicators from RP2 have evolved for RP3 purposes and these Local KPIs and indicators for monitoring are detailed in Annex 1 of the Regulation. These include an additional Capacity KPI compared to Union-wide targets: arrival ATFM delay per flight attributable to terminal and airport ANS. In addition, there are also two local Cost-efficiency KPIs, which are DUC for en route and terminal ANS.

**Figure 1 Summary of EU-wide targets for RP3\***

\*Union-wide targets for RP3 (2020-2024) across the four key performance areas (KPA's)

IAA welcomes the further clarity on RP3 that the European Commission provided by publishing a Statement at the Single Sky Committee 71, which took place on 26 and 27 March 2019. Three key takeaways from this Statement are listed below:

1. With respect to local baseline values, the Commission noted that each Member State should establish their own baseline values at local level, for which the method chosen by the Member State should be transparent, justified and consistent with point (a) of Article 10(2) of Regulation 2019/217.
2. The Commission will take local circumstances into account when assessing the consistency of proposed national or FAB targets with the Union-wide targets.
3. As regards the targets in the key performance area of cost-efficiency, the Commission recalls the assessment criteria set out in point 1.4(d)(i) of Annex IV to Commission Implementing Regulation (EU) 2019/317, which allows a deviation from the criteria set out in points (a) to (c) in order to allow the achievement of performance targets in the key performance area of capacity set at national level provided that the deviation from the Union-wide determined unit cost trend is exclusively due to additional determined costs related to measures necessary to achieve the performance targets in the key performance area of capacity.

The Statement from the Commission is provided in full in Figure 2 overleaf.

It is particularly helpful as it confirms that the Union-wide targets are accurately titled as targets and are not binding in themselves for each individual ANSP. The IAA welcomes this as Ireland's good performance over the course of RP1 and RP2 means that there would be little scope to continuously deliver upon targets, compared to other States which may not have performed so well to date. The Commission followed up with assurances to Member States that targets including, for example, the 1.9% annual reduction in costs is an ambitious target at a Union-wide level and that it is the Member State performance plans that are binding.

The ANSP therefore needs to comply with the regulations by setting out its required costs in a clear, objective and transparent manner, while demonstrating that any variance (additional costs) with the Union-wide cost efficiency target is justified, in particular on the basis of being critical to ensuring sufficient capacity. This Business Plan is structured accordingly.

**Figure 2 Statement by EC at SSC 71 in full**

It is the Commission's view that Union-wide targets in the key performance area of capacity should reflect the expected performance of the network as a whole. Binding national or FAB targets should be such as to accommodate anticipated traffic demand. The Commission will take local circumstances into account when assessing the consistency of proposed national or FAB targets with the Union-wide targets. Such local circumstances may lead to setting capacity targets in some areas which differ from the reference values calculated by the Network Manager, provided that there is a clear indication that the capacity situation in those areas will improve to accommodate the capacity demand at local and network levels. The Commission, when adopting Decisions on the consistency of local capacity targets, will communicate the aggregation of the targets set at local level and their effect on the network-wide capacity provision.

The Commission points out that in the context of the foreseen measures to improve the network capacity situation, additional delay incurred by the onloaded area control centres will be subsequently reattributed to the area control centres which are the root cause of the rerouting of flights, as a result of the NM post-operations delay attribution process.

For the assessment of performance targets in the key performance area of environment, the Commission will take local circumstances into account when comparing the national or FAB targets with the *en route* horizontal flight efficiency reference values set out in the latest version of the European Route Network Improvement Plan.

As regards the targets in the key performance area of cost-efficiency, the Commission recalls the assessment criteria set out in point 1.4(d)(i) of Annex IV to Commission Implementing Regulation (EU) 2019/317, which allows a deviation from the criteria set out in points (a) to (c) in order to allow the achievement of performance targets in the key performance area of capacity set at national level or at the level of functional airspace blocks provided that the deviation from the Union-wide determined unit cost trend is exclusively due to additional determined costs related to measures necessary to achieve the performance targets in the key performance area of capacity.

Regarding local baseline values, the Commission underlines that each Member State should establish their own baseline values at local level, for which the method chosen by the Member State should be transparent, justified and consistent with point (a) of Article 10(2) of Regulation 2019/217.

### **Eligible Costs for RP3**

The final version of the “Manual for the Verification of Air Navigation Services Costs in the context of the Single European Sky Charging Scheme” was published by the Commission in March 2019<sup>1</sup>. The manual referred to as the ‘Cost Eligibility Manual’, provides guidance and best practices to NSAs on the verification and oversight of the costs of air navigation services that are charged to airspace users. It follows the recommendations on verification of costs made by the European Court of Auditors.

It is also expected that future guidance will be released by the European Commission throughout 2019.

### **Revised Treatment of Incentives during RP3**

The incentives scheme for capacity in RP2 is fixed, with no flexibility at a local level. Reference Values (RVs) are set for each MS, which contribute to the achievement of the FAB-level capacity target. Deviation from these RVs in year n result in a bonus or penalty of up to 1% of revenues for the ANSP, adjusted in unit rates in year n+2.

The new regulation for RP3 offers the ability to better tailor schemes to traffic developments observed at a local level. ‘Pivot Values’ (PV) replace RVs (Article 11(3)(c)), which may be based: on the performance targets at national level, broken down at the level of each individual air navigation service provider; or on modulated performance targets at national level, broken down at the level of each individual air navigation service provider, set annually by the NSA for the following year.

Due to the uncertainty around Brexit, we have welcomed the continuation of a traffic risk sharing mechanism similar to that implemented in RP2. Full details are set out within Article 27 and point 5 of Annex II of the new regulation.

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<sup>1</sup> [https://webgate.ec.europa.eu/eusinglesky/news/useful-materials-rp3\\_en](https://webgate.ec.europa.eu/eusinglesky/news/useful-materials-rp3_en)

### 3 The role of the National Supervisory Authority

The commercial arm of the IAA, referred to as the Air Navigation Service Provider ('ANSP'), is under the supervision of the National Supervisory Authority ('NSA'), who is tasked with ensuring the implementation of the European Regulation at local level.

Article 10(4) of the Implementing Regulation sets out that “[NSAs] shall consult air navigation service providers, airspace users' representatives and, where relevant, airport operators and airport coordinators on the draft performance plans, including on the performance targets and incentive schemes contained therein”. It follows that in advance of RP3, the Irish NSA will consult on the planned costs, investment, traffic and appropriate charges.

It is important to note that while the NSA is tasked with oversight of the Implementation Regulation at national level, the NSA and the European Commission have enough scope to avoid imposing Union-wide targets at national level if they are deemed to be unrealistic taking account of local circumstances, or if the NSA determines a different set of targets, following a comprehensive consultation process and thorough review.

As there is one aspect of the Implementing Regulation that would have a material impact on the deliverability of this plan and the outcomes that our customers expect – namely the targeted reductions in costs of 1.9% per annum over the five-year period – we have therefore advised the NSA (and previously advised the PRB and the SES Unit of the EC) of the need for a cost increase in order to ensure the achievement of planned targets, and have presented this Business Plan accordingly.

Notwithstanding the fact however that a cost increase is required, the IAA has made it clear to the NSA, the PRB and the EC that we will maintain our position as one of the lowest costs, best value for money ATM service providers in Europe, whilst continuing to prioritise safety as our core function.

Having regard to the overriding safety objectives and the related interdependencies with other performance targets, this Business Plan demonstrates the need for an increase in cost for the ANSP in RP3. While the Business Plan seeks to ensure that the targets relating to safety, environment and capacity are met during RP3, the required unit rate (approximately 20% below the EC's target efficient unit rate) implies that we will continue to operate significantly above the efficiency frontier set by the European Commission throughout RP3.



## 4 Priorities of IAA ANSP Customers

### Background

The IAA ANSP requires an understanding of our Airline Customers' needs and expectations so that we can meet them in our day-to-day operations. We provide our Customers with opportunities to communicate with us at all levels and with key operational data to help inform their decision-making processes. Our largest Customers by revenue, are airlines operating in the highly competitive global commercial aviation industry, and are located across Europe, North America, the Middle East and Asia. Table 1 below shows our top 30 Customers by revenue in 2018.

**Table 1 Top 30 Customers by Revenue**

AER LINGUS	EMIRATES	QATAR AIRWAYS
AIR CANADA	ETHIOPIAN AIRLINES	RYANAIR
AIR FRANCE	ETIHAD AIRWAYS	STOBART AIR
AIR TRANSAT	FEDERAL EXPRESS	SWISS
ALITALIA	JET2.COM	THOMAS COOK AIRLINES
AMERICAN AIRLINES	KLM	THOMSON AIRWAYS
BRITISH AIRWAYS	LUFTHANSA	TURKISH AIRLINES
CARGOLUX	NORWEGIAN AIR INTL	UNITED AIRLINES
CONDOR	NORWEGIAN AIR UK	UPS
DELTA AIR LINES	NORWEGIAN AIRSHUTTLE	VIRGIN ATLANTIC

### **Relevance for RP3**

The NSA will be consulting with stakeholders on the IAA ANSP proposed business plan for RP3. The IAA engaged with our customers in 2018<sup>2</sup>, as we do every year to ensure we understand what matters most to our customers.

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 Low Cost Carriers to Full Service Airlines. This group represented approximately 88% of flights in Irish airspace and 87% of IAA ANSP's revenues in 2018.

In 2018, we commissioned Schuman Associates, a Brussels based consultancy, to conduct an online Customer Satisfaction survey on our behalf and a new survey format that fosters critical analysis by our Customers of the IAA ANSP's operation was introduced. It prompted Customers to record their opinions of our services, it measured their attitudes and their perceptions of change, and provided a strengthened focus on trends – it also asked them to provide a score out of 100 for overall Customer Satisfaction.

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.

### **Top Priorities**

Our customers indicated that "Efficient Airspace" is the most important consideration to their airline with more than half of respondents (55%) ranking this as a top priority. Related to this more than one quarter of respondents (26%) indicated that "Low Levels of Delay" is their top priority. "Operational Resilience" was also considered to be of fundamental importance by the remaining 19% of responding customers.

Responding to the top priorities of our customers we are implementing a number of airspace and capacity improvements during RP3 including redesign of Dublin terminal airspace to handle parallel runway operations, cross border free route airspace, time-based separations, etc. We are also focusing on improving contingency – for example, the En Route contingency centre at Ballygirreen will provide a full suite of communications and ATM systems that are independent from our Shannon Centre.

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<sup>2</sup> The 2019 IAA Customer Care Programme is ongoing with results available in early 2020.

**Other Considerations**

As expected, “Low User Charges” and “Customer Relationship” are also important to our customers. However, these factors were not ranked as a number 1 priority in the 2018 survey, possibly reflecting the fact that IAA overflight charges are amongst the lowest in Europe.

Notwithstanding the ranking of these results, we are acutely aware that cost control is critically important to our Customers and we continue to provide assurances that the IAA will continue to provide excellent value for money by providing safe and efficient ATM services at some of the lowest user charges in Europe.

We also believe that a good working relationship with our Customers is very important and our Customer Care programme will continue to successfully support these relationships.

**Figure 3 Customer Priorities: Feedback from 2018 Independent Surveys**

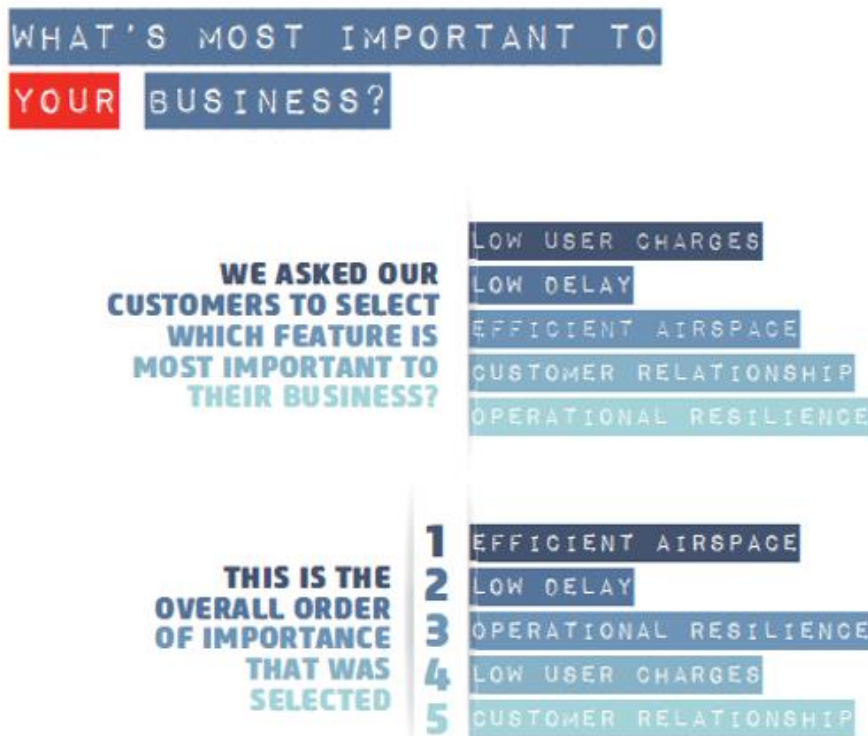


Figure 4 Customer Scores by Category

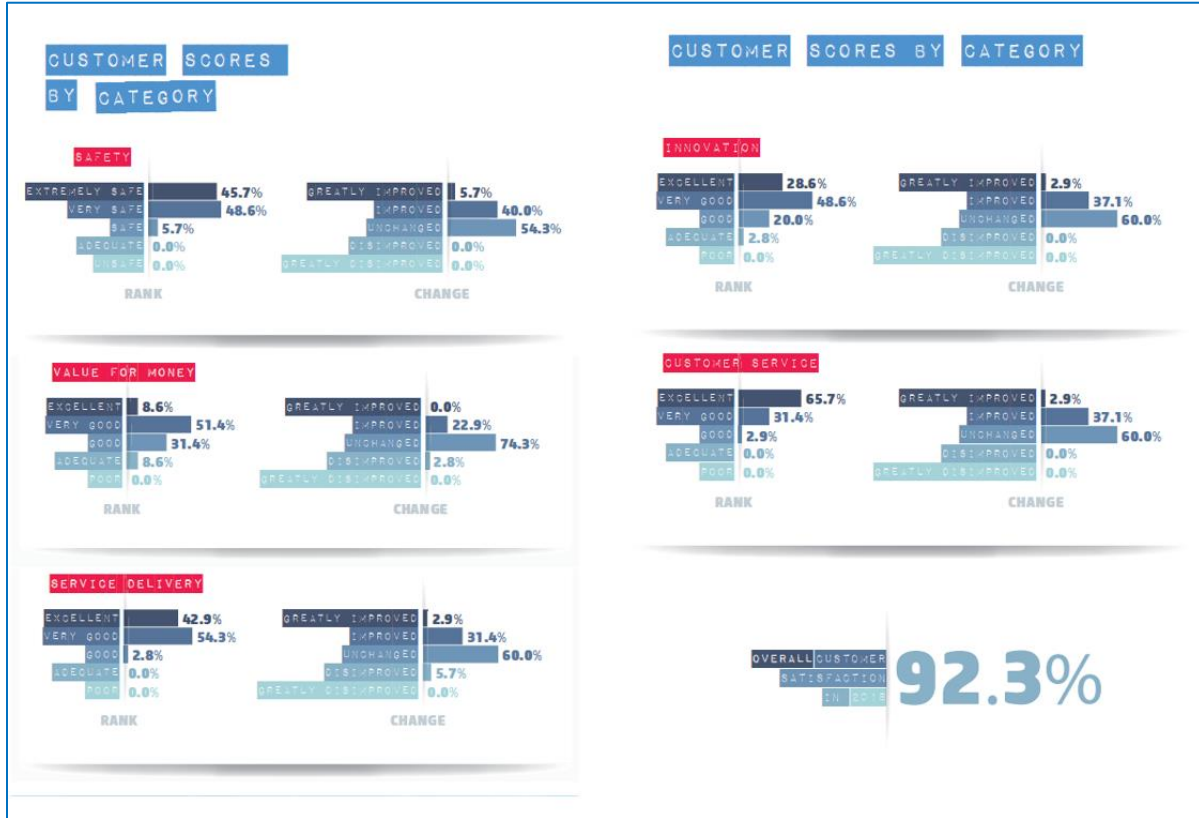


Figure 4 provides some insights into our customer perceptions regarding (1) Safety, (2) Innovation, (3) Value for Money, (4) Customer Service and (5) Service Delivery.

Overall, we achieved a Customer Satisfaction Score of 92.3% in 2018.

### **Commitment to meeting the needs of our Customers throughout RP3**

We have been engaging with our Customers to ensure they understand and are satisfied with the level of contingency across our operations. In line with our Customer Care Programme, we will maintain the day to day interface between our Customers and our front-line Operations teams and enhance this interface as required.

In summary, our customers have confirmed that they recognise the value in the high-quality service that we provide and that they are satisfied with it. Moreover, our customers want a continuation of this service and avoid any perverse outcome during RP3 which would lead to a lowering of the service quality. Naturally, commercial entities will seek out lower costs but not at the expense of service quality – our consultations to date have confirmed our customers are very satisfied with the service we provide at the price on offer, which is one of the lowest in Europe (see Figure 30 and Figure 31).

Furthermore, we will continue to work with all stakeholders to drive further efficiencies where possible. In doing so, we will continue to engage with our customers throughout RP3 to ensure we continue to provide services that best meets their needs.

## 5 Economic outlook and projected traffic during RP3

### Economic Assumptions

This section identifies a range of relevant macroeconomic indicators that are related to the operating of our business and connected to the levels of traffic on our network.

### Inflation

Inflation has been uncharacteristically suppressed in Ireland for much of RP2 but the IMF’s CPI projections for Ireland have inflation returning to the European Central Bank’s target of close to but below 2% by 2022.

**Figure 5 IMF CPI Projections – World Economic Outlook April 2019**

IMF CPI Projections	
2019:	1.2%
2020:	1.5%
2021:	1.7%
2022:	1.9%
2023:	2.0%
2024:	2.0%

### Projected GDP growth

En route traffic in Irish airspace is largely driven by factors exogenous to the performance of Ireland’s economy as the majority of traffic is between North America and the rest of Europe. Consequently, the performance of the US and Eurozone economies is of great significance, and the IMF is projecting continued growth in these regions during RP3. Terminal traffic is more affected by Irish GDP growth, other domestic factors, and UK and European growth.

**Table 2 Projected Real GDP Growth Forecast**

	2019	2020	2021	2022	2023	2024
Ireland	3.45%	3.13%	2.87%	2.67%	2.71%	3.45%
Eurozone	1.28%	1.55%	1.48%	1.44%	1.39%	1.36%
US	2.33%	1.87%	1.77%	1.64%	1.62%	1.57%

It is worth noting that the IMF's baseline projections assume that a Brexit deal is reached in 2019 and that the United Kingdom transitions gradually to the new regime. It does acknowledge, however, that the form Brexit will ultimately take remained highly uncertain in March 2019 when it was finalising its latest projections in April's World Economic Outlook.

### **Ongoing Brexit Uncertainty**

Despite the recent extension to the deadline under which the UK has to leave the EU, there is considerable uncertainty regarding how the departure date will actually come about, and regarding the type of deal (if any) that will be in place. This is fuelling the ongoing uncertainty on how businesses will be affected and, from our perspective, whether the volumes of Ireland-UK air travel passengers will be affected.

In April 2019, the UK agreed to the EU's offer to delay Brexit until October 2019 in a move that has prolonged the uncertainty surrounding the range of Brexit possibilities. In order to secure this extension and avoid being forced to leave in June, the UK has had to contest the European elections in May and ensure that the Withdrawal Agreement was ratified in advance – otherwise the exit date would have been brought forward to 1 June.

There is a scheduled Brussels summit of the European Council on 20 June whereby leaders of the remaining EU Member States will review progress towards Brexit. The new European Parliament will have its first session at the beginning of July, and in the weeks that follow there is expected to be increased calls in the UK for a second referendum on Brexit.

Unless a further extension is agreed in the meantime, the final deadline for the UK to leave the EU is 11pm on 31 October 2019 – with or without a deal. In May 2019, Ernst & Young (EY) indicated that there was a 20% possibility that the UK would leave the EU without a deal.

**Table 3 EY Speculation on Brexit Outcome (May 2019)**

	Likelihood	Change since last issue
WTO (no-deal)	20%	Less likely
FTA	15%	More likely
Single market + customs Union	10%	More likely
Hybrid arrangement	40%	More likely
Remain in EU/EEA	15%	Less likely

Source: EY Estimates

### Potential Impact of Brexit

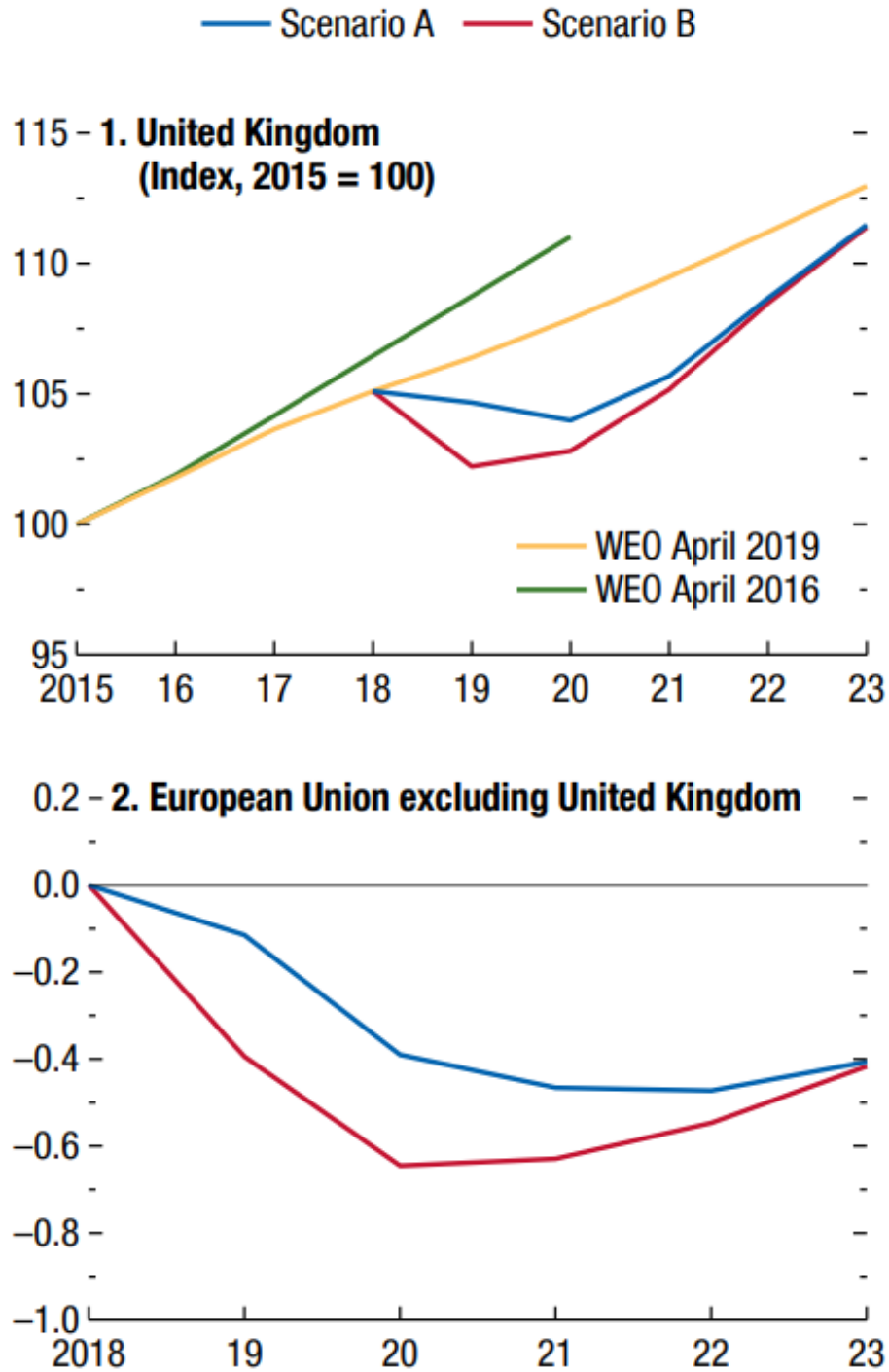
Almost one-third of the traffic to and from Dublin Airport is with the UK and a similar proportion of Enroute traffic departs from the UK or is destined for the UK – the implication of this is that any negative impacts on the UK economy which affects travel will in turn impact Ireland’s en route traffic.

In its April 2019 World Economic Outlook, the IMF has noted that the risks surrounding Brexit remain heightened. It further notes that a no-deal Brexit that severely disrupts supply chains and raises trade costs could potentially have large and long-lasting negative impacts on the economies of the United Kingdom and the European Union.

This is modelled in the Figure overleaf which considers two no-deal Brexit scenarios and compares these to the counterfactual of a smooth withdrawal. Scenario A has no border disruption and the tightening of financial conditions is moderate whereas in Scenario B there is border disruption assumed and the tightening of financial conditions is more severe.



Figure 6 No deal scenarios A & B (with and without border disruption)



In March 2019, a report<sup>3</sup> by the ESRI and the Department of Finance concluded that GDP in Ireland ten years after Brexit will be around 2.6% lower in a Deal scenario, 4.8% lower in a No-Deal scenario and 5.0% lower in a Disorderly No-Deal scenario respectively, compared to a situation where the UK stays in the EU.

The results indicate that employment, in the long-run, would be 1.8% lower in a Deal scenario, 3.2% lower in a No-Deal scenario and 3.4% lower in a Disorderly No-Deal scenario respectively, compared to a situation where the UK stays in the EU.

In summary, this report found that the impact of each Brexit scenario is considerable and will have negative effects throughout the economy on the household sector, the labour market, firms and the public finances – the negative impact on Irish output in the long run in the Deal scenario is approximately half that of the No-Deal scenario

**Table 4 Comparison of recent studies on long-term impact of Brexit on UK**

Study	Scenario	GDP % Change Relative to Base
Bank of England (2018)	Deal + FTA	-1.5
	Deal + Backstop	-3.8
	No Deal	-7.8
	Disorderly No Deal	-10.5
HM Treasury (2016)	EEA	-3.8
	FTA	-6.2
	WTO	-7.5
HM Government (2018)	EEA	-1.4
	FTA	-4.9
	No Deal	-7.6
IMF (2018)	FTA	-3.1
	WTO	-6.2
Kierzenkowski et al. (2016)	WTO/FTA (Optimistic)	-2.7
	WTO/FTA (Central)	-5.1
	WTO/FTA (Pessimistic)	-7.7
NIESR (Hantzsche et al., 2018)	Deal + FTA	-3.9
	Deal + Backstop	-2.8
	No Deal	-5.5
Oxford Economics (2016)	Liberal Customs Union	-0.1
	FTA	-2.8
	WTO	-3.9
Vandenbussche et al. (2019)	Norway Deal	-1.2
	No Deal	-4.5

<sup>3</sup> [https://www.esri.ie/system/files/publications/QEC2019SPR\\_SA\\_Bergin.pdf](https://www.esri.ie/system/files/publications/QEC2019SPR_SA_Bergin.pdf)

**Table 5 Comparison of recent studies on long-term impact of Brexit on Ireland**

Study	Scenario	GDP % Change Relative to Base
Arriola et al. (2018)	No Deal	-2.3
	EEA	-2.3
Bergin et al. (2017b)	FTA	-2.7
	WTO (No Deal)	-3.8
	EEA	-2.8
Copenhagen Economics (2016)	FTA	-4.3
	No Deal	-7.0
	No Deal	-3.2
Conefrey et al. (2018)	No Deal	-3.2
Central Bank of Ireland (2019)	Disorderly No Deal	-6.0
	FTA	-2.5
IMF (2018a)	No Deal	-4.0
	Norway Deal	-1.3
Vandenbussche et al. (2019)	Norway Deal	-1.3
	No Deal	-5.7

At the time of writing this Business Plan (May 2019), Michael Gove described the real prospects of a no deal Brexit and speaking to the Telegraph<sup>4</sup> noted that "We have to face facts. At the moment the arithmetic in the House of Commons is opposed to leaving without a deal. There would be economic challenges. We could get through them, but they would undoubtedly be there in the short term."

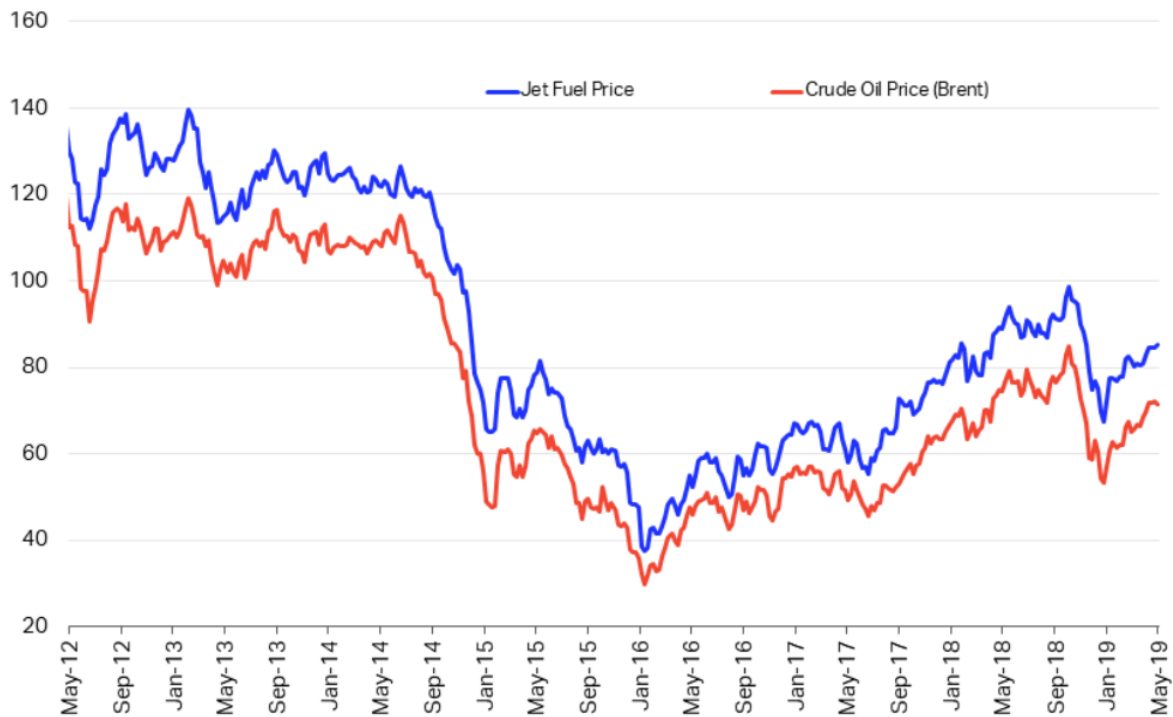
This Business Plan has not "planned for the worst" by assuming a no-deal Brexit with a detrimental impact on traffic during RP3. Despite the magnitude of the Brexit-related uncertainty, we have followed the European Commission's recommendation to include the Base Case STATFOR scenario in the Plan.

<sup>4</sup> <https://www.politicshome.com/news/uk/foreign-affairs/brexit/news/103674/michael-gove-warns-hardline-brexiters-face-facts-over-no>

### Oil Prices

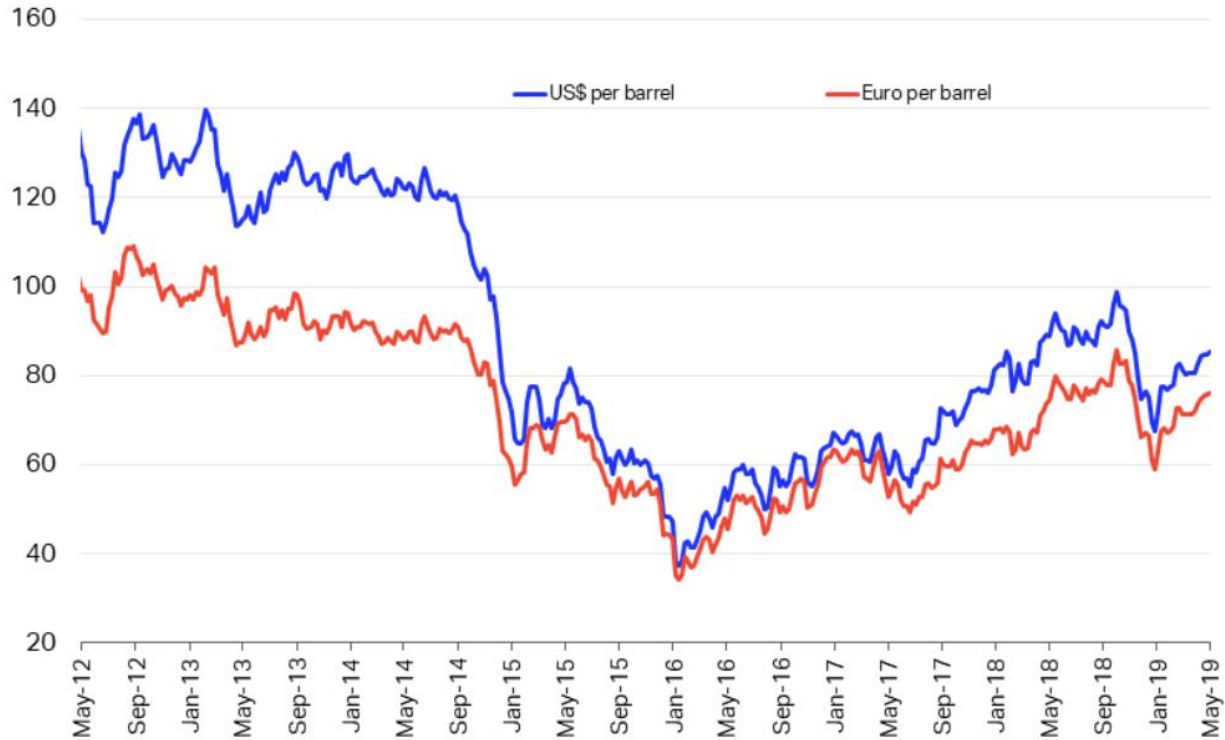
The price of oil is an important factor in the aviation industry and there appears to have been a correlation with the reduced oil prices during RP2 and the surge in traffic growth in recent years. This trend appears to be moving in the opposite direction and in April this year Brent crude oil prices surged to €63 per barrel in April, which was the strongest April in five years.

**Table 6 Jet Fuel & Crude Oil Prices (\$/barrel)**



Source: Platts, Datastream

**Table 7 Jet Fuel price developments: exchange rate movements**



Source: Platts, Datastream

The above shows that when movement in exchange rates between the dollar and euro are accounted for, the trends of lower oil prices corresponding to higher traffic remains the case.

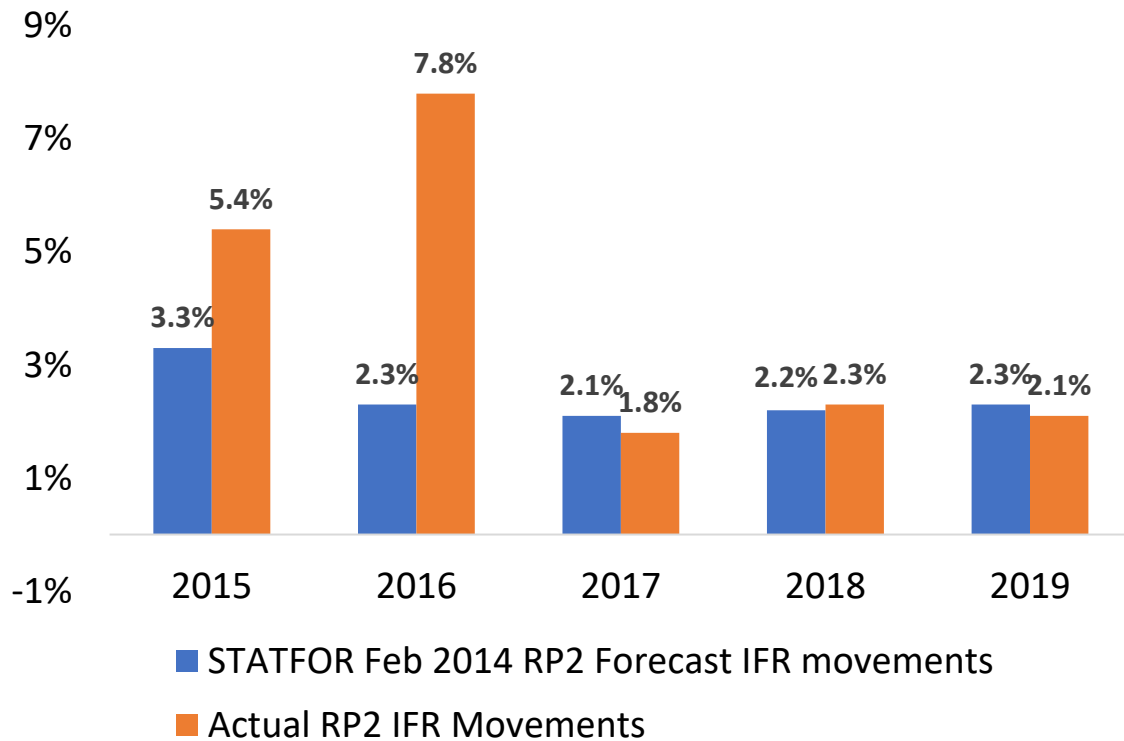
**Relevance of traffic projections to this Business Plan**

The projected en route traffic for the five-year period 2020-2024 is a key input into ANSP Business Plans for RP3. It is an important consideration that impacts capacity considerations such as staffing requirements and training needs and it has an important bearing on the en route charges that prevail in each year<sup>55</sup>.

<sup>55</sup> Determined costs for en route and terminal charges are established prior to the start of each reference period, as part of the ANSP performance plans. Determined unit costs are set by dividing the required / determined costs by the traffic projection expressed in service units.

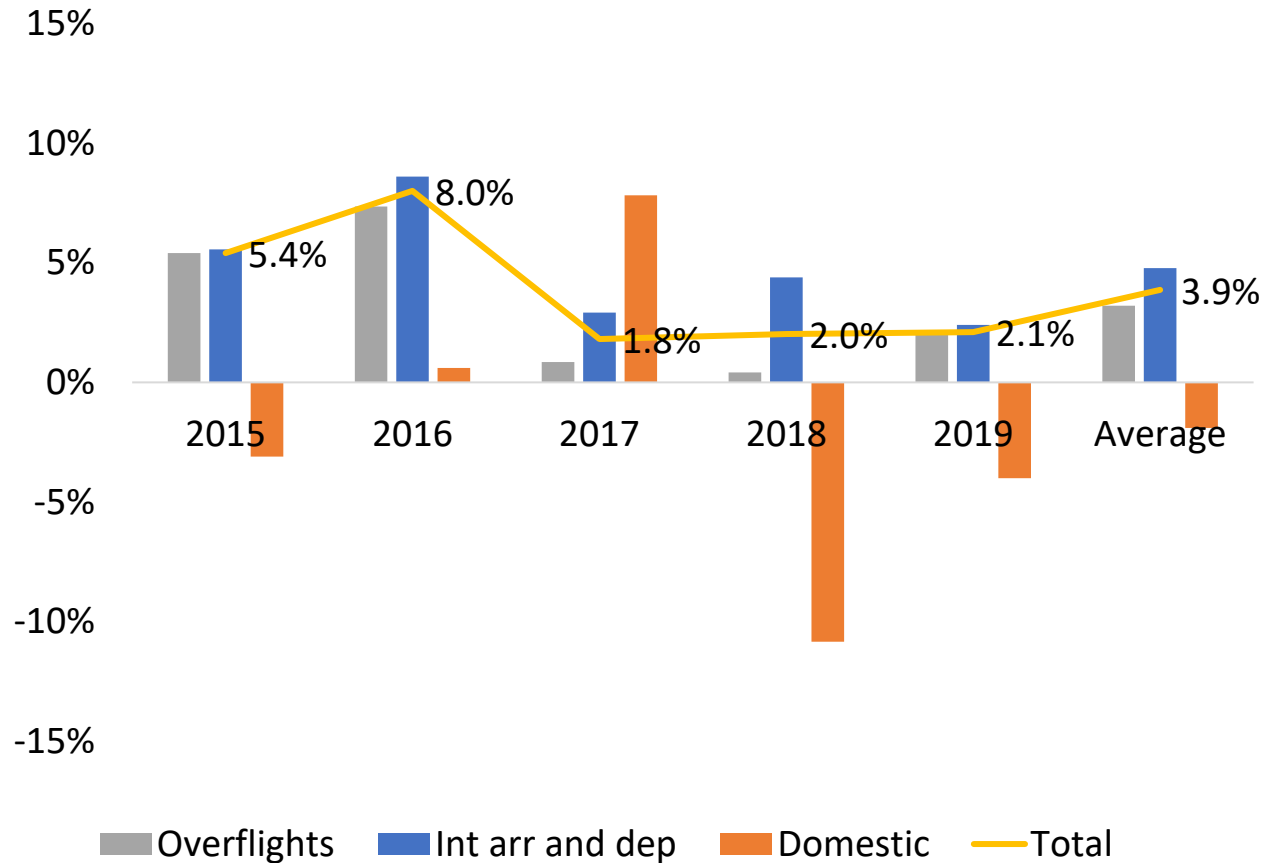
Traffic in RP2

Figure 7 RP2 STATFOR IRE Forecast v Actual (Annual IFR Mvmt Growth)



It transpired however that actual traffic during RP2 significantly exceeded previous STATFOR forecasts from which the Business Plan were based on 2014. The higher than projected traffic during this time is well known in the industry and there were many factors contributing to this development including a stronger than expected recovery in major economies and in particular our own domestic economy.

**Figure 8 RP2 Traffic for Ireland 2015-2019 (Annual Growth Rates)**



2015 and 2016 witnessed exceptional growth both in overflights and international arrivals and departures. These traffic flows account for 54.5% and 44.5% of all traffic respectively. Normalised growth patterns have been observed in these categories in 2017 and 2018. The increase in North Atlantic traffic tends to be lower than that of international arrivals and departures (mainly Dublin airport). Domestic traffic has been in decline for several years, albeit accounting for less than 1% of all traffic.

**Guidance from the European Commission for RP3**

The European Commission’s Implementing Regulation (2019/317) “laying down a performance and charging scheme in the single European sky”, states that the Commission shall set the Union-wide targets based on the latest available EUROCONTROL Statistics and Forecast Service (‘STATFOR’) base forecast. Accordingly, the Union-wide targets are based on the most recent STATFOR base case

scenario for the EU. However, the Commission's Implementing Decision<sup>6</sup> for RP3 sets out the Union-wide performance targets reflect the ambition for performance of the network as a whole and that in accordance with Articles 14 and 15 of Regulation (EU) 2019/317, the Commission takes into account local circumstances when assessing the consistency of the national performance targets contained in the draft performance plans with the Union-wide performance targets.

The Implementing Regulation has specified that National Supervisory Authorities may decide to use other en route and terminal traffic forecasts than those based on EUROCONTROL's STATFOR base forecast. In that case, they shall consult the airspace users' representatives and air navigation service providers concerned and set out the reasons for using the other forecasts in the performance plan. Any differences with the EUROCONTROL's STATFOR base forecast shall be related to specific local factors not sufficiently addressed by EUROCONTROL's STATFOR base forecast. The same forecasts shall be used for all key performance areas.

The EUROCONTROL STATFOR forecasting model produces traffic growth forecasts on three main IFR traffic flows; overflights, international arrivals and departures, and internal domestic flights. This model fits well with the traffic patterns in Irish airspace where 54.5% of flights are generally overflights, 44.5% international arrivals and departures and less than 1% internal domestic. The rate of growth of overflying traffic is mainly influenced by the macroeconomic environment in Europe and North America. With 86% of international arrivals and departures are to and from Dublin airport; growth in the status of Dublin as a transatlantic hub will continue to be a significant factor. Domestic traffic is of small and declining significance due in part to the efficiency of the ground transportation system.

### **General expectations 2020-2024**

The higher than expected growth in traffic during RP2 is unlikely to be sustained, or repeated, during RP3. There are a number of factors that suggest more modest growth rates including:

1. A slowdown in global economic growth and a precarious recovery, as noted by the IMF in its April 2019 World Economic Outlook;

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<sup>6</sup> Implementing Decision 2019/XX setting the Union-wide performance targets for the air traffic management network for the third reference period starting on 1st January 2020 and ending on 31st December 2024

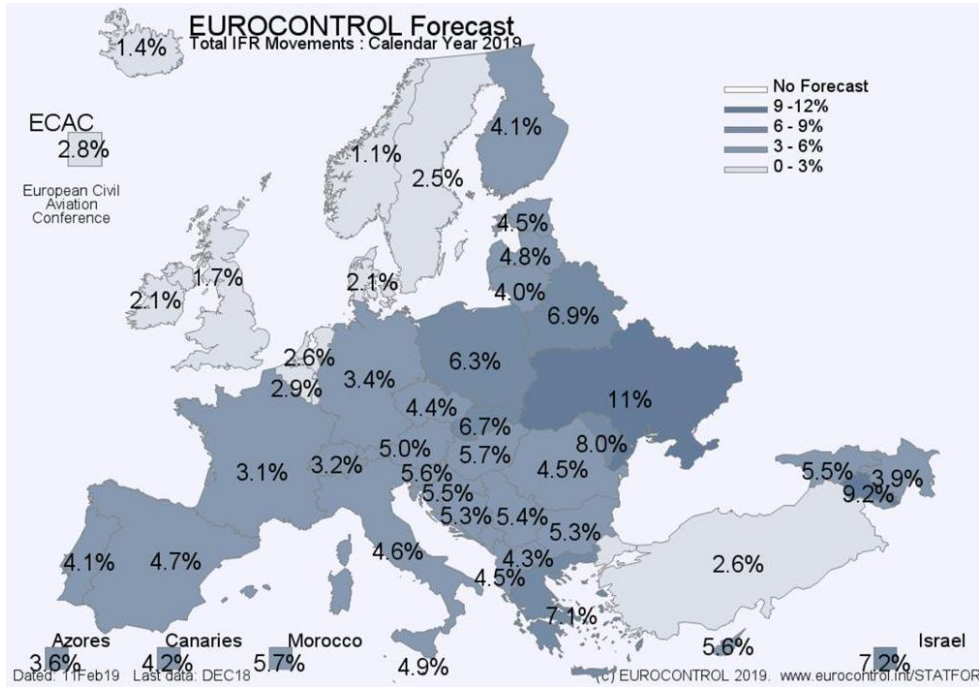


2. A constrained environment at Dublin airport until the operation of the new parallel runway and associated ground infrastructure is in place.
3. Higher oil price: Brent crude oil prices surged to €63 per barrel in April, which was the strongest April in five years.
4. An increasing trend of airline consolidation and profit warnings with some carriers ceasing operations;
5. Uncertainty associated with the UK's decision to leave the EU and the impact it will have on traffic volumes during RP3 – more than 10 million passengers travelled to and from the UK through Dublin Airport in 2018, representing almost one-third of all passengers at Dublin Airport with a similar proportion of Irish overflights to or from UK destinations.

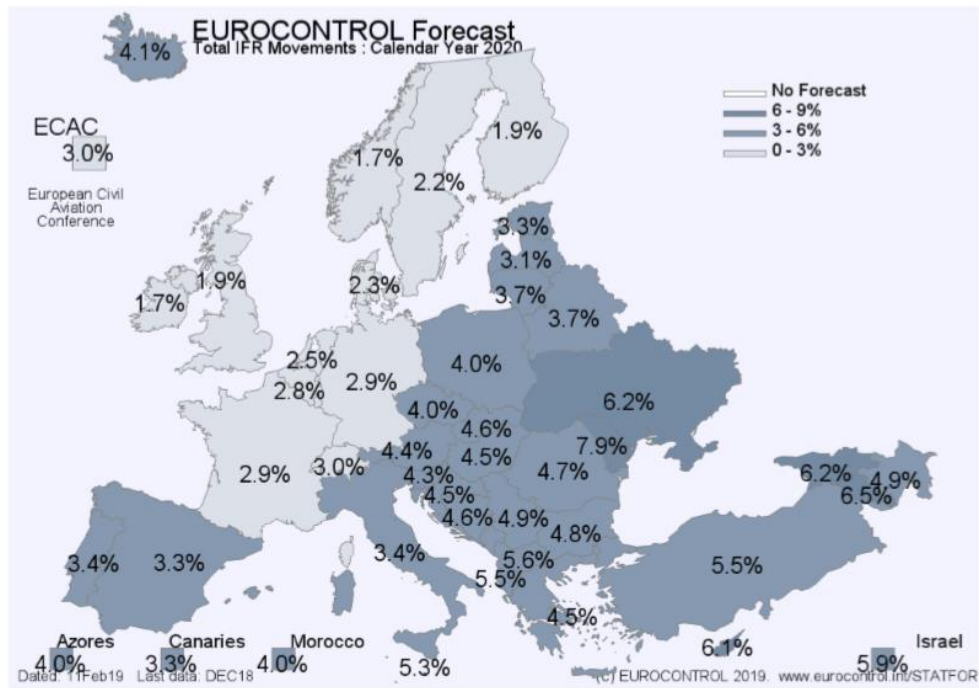
### **EUROCONTROL STATFOR Projections**

Traffic between the ESRA North West region and North Atlantic (overflights) is expected to grow at a slower pace than overall network traffic. Traffic within the ESRA North West region is also expected to grow at a slower pace than overall network traffic reflecting the maturity of the market and the general economic slowdown. These two traffic flows account for over 90% of traffic in Ireland's airspace. This general slowdown in growth is illustrated below for 2019 and 2020.

**Figure 9 Projected IFR Movements in 2019 for Ireland compared to Europe**

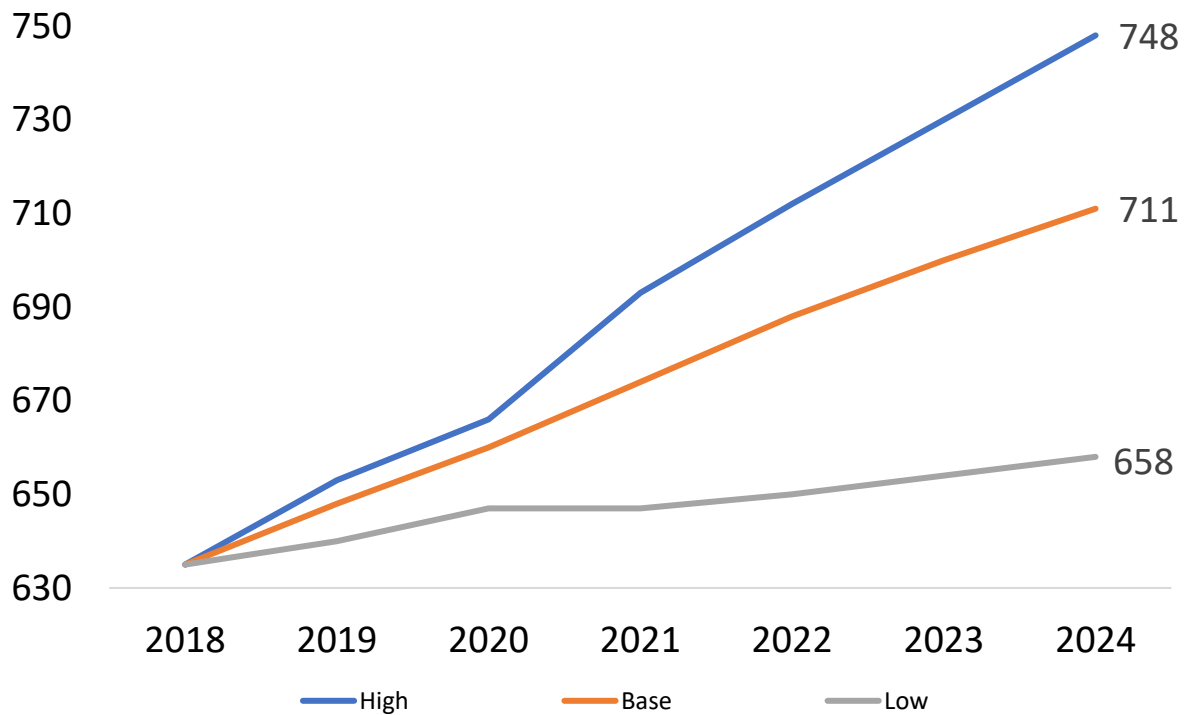


**Figure 10 Projected IFR Movements in 2020 for Ireland compared to Europe**

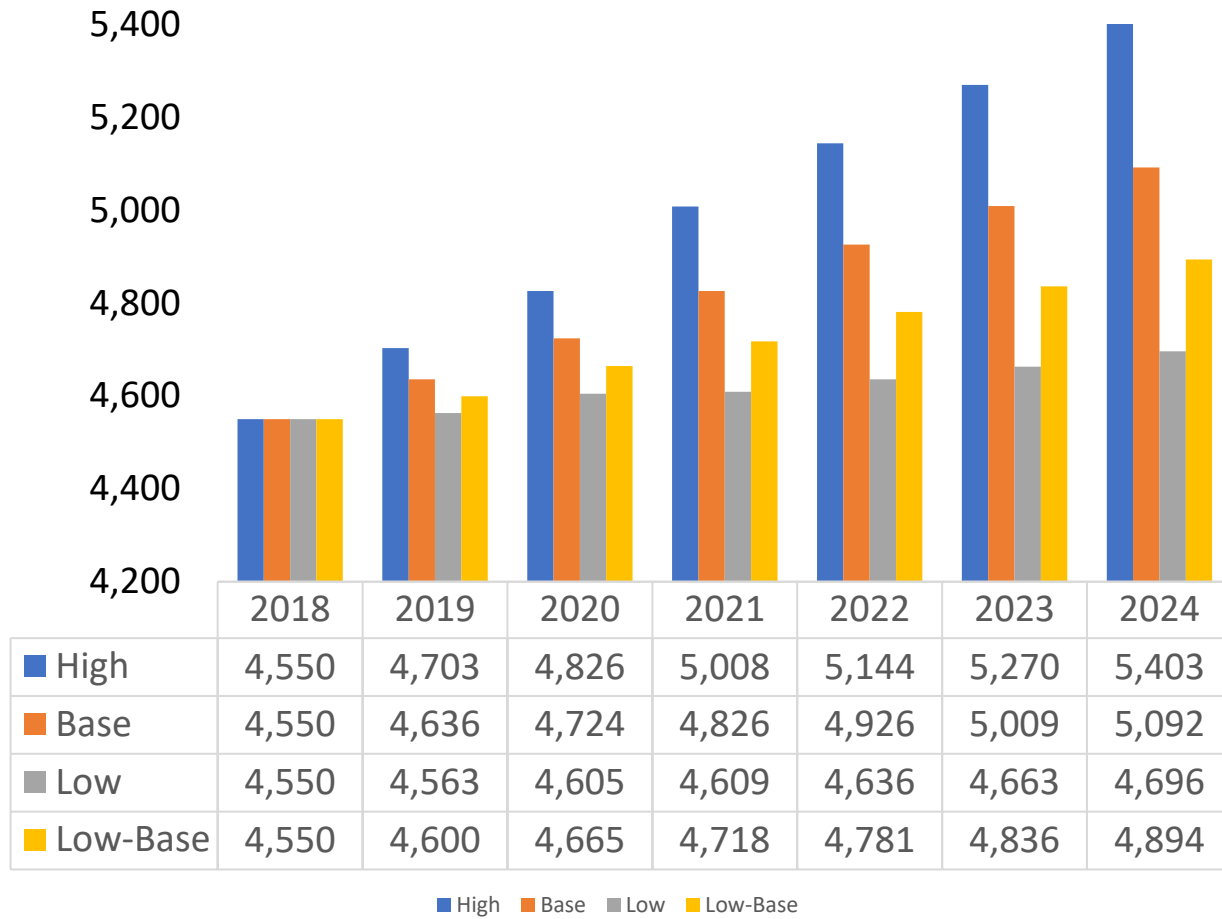


Projected traffic scenarios detailed in the STATFOR Seven-Year Forecast from February 2019 are illustrated in Figure 2 below. There is one STATFOR scenario that reflects a Hard Brexit (low scenario) whereas STATFOR otherwise assumes that the UK has a smooth withdrawal from the Eurozone.

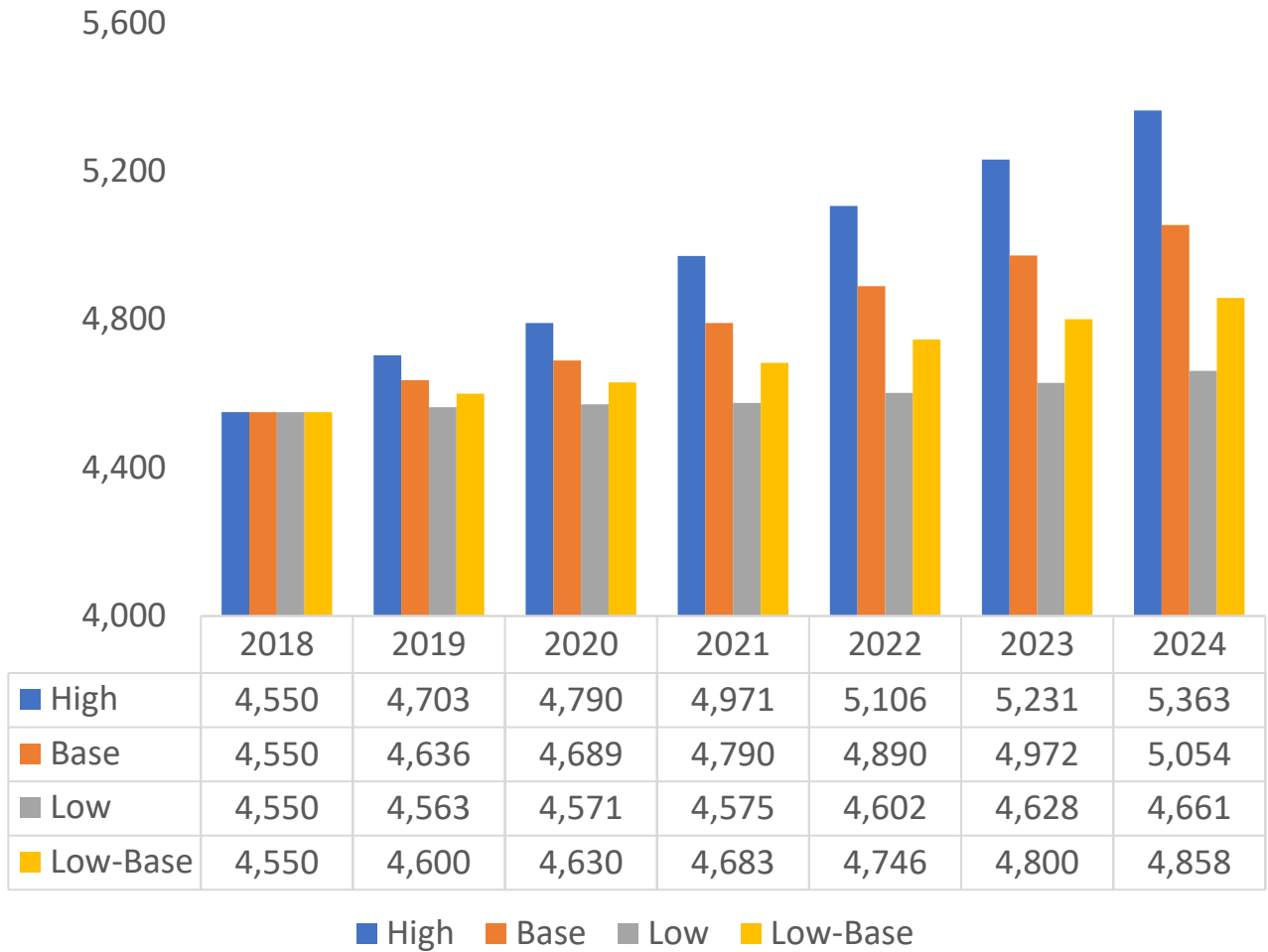
**Figure 11 STATFOR Feb 2019 Forecast IFR Movements (000s)**



**Figure 12 En Route Service Units (M2 methodology)**



**Figure 13 En Route Service Units (Revised Methodology: M3)**



### STATFOR Scenario for RP3

Due to the considerable uncertainty surrounding BREXIT and the potential impact on the Irish economy and the UK economy which significantly influences air traffic levels in Ireland, it is prudent for the IAA to plan for the negative consequences of Brexit including considering the use of the STATFOR low case forecast. However, under the low case scenario, the expected annual growth in RP3 for IFR movements in Irish airspace is one sixth of that observed in RP2 (0.6% down from 3.8%). The high forecast has been set at +2.8% and the base at +1.9%.

**Table 8 Traffic Projections based on STATFOR low case scenario<sup>7</sup>**

(000s) / % Change	2019	2020	2021	2022	2023	2024	AAGR 2020- 2024
IFR movements	640	647	647	650	654	658	
% Change	0.70%	1.1%	0.0%	0.6%	0.6%	0.7%	<b>0.6%</b>
Service Units	4,563	4,605	4,609	4,636	4,663	4,696	
% Change	0.30%	0.90%	0.10%	0.60%	0.60%	0.70%	<b>0.6%</b>
Terminal Service Units	184.6	185.5	184.6	185.1	185.7	185.8	
% Change	1.10%	0.50%	-0.50%	0.30%	0.30%	0.10%	<b>0.1%</b>

The expected annual growth for North Atlantic IFR movements in Irish airspace is half of that forecast for all movements (0.34%). This lower growth is consistent with the generally observed trend in this traffic flow compared to other flows (apart from the recovery from the 2008-2011 global financial crisis).

The expected annual growth in en route service units (0.6%) is exactly the same as the IFR movements over the RP3 period (with small variations in some years).

For RP3 there is almost no growth forecast in terminal service units; 0.1% per annum, within a high band at 3.2% and the base at 1.9% under the latest STATFOR scenarios. The RP2 average annual growth is expected to be 6.4% (2015 to 2018 actuals plus forecast for 2019). This is a very significant decrease. A very significant slowdown on the

rates of growth witnessed in the last four years is expected already in 2019. The major growth limiting factor is the assumption of a hard BREXIT.

### STATFOR Base Case Scenario for RP3

The expected annual growth in RP3 for IFR movements in Irish airspace is half of that observed in RP2 (1.9% down from 3.8%). The high forecast has been set at +2.8% and the low at +0.6%.

**Table 9 Traffic Projections based on STATFOR base case scenario<sup>8</sup>**

(000s) / % Change	2019	2020	2021	2022	2023	2024	AAGR 2020- 2024
IFR movements	648	660	674	688	700	711	
% Change	2.1%	1.7%	2.1%	2.1%	1.7%	1.7%	<b>1.9%</b>
Service Units	4,636	4,724	4,826	4,926	5,009	5,092	
% Change	1.9%	1.9%	2.1%	2.1%	1.7%	1.7%	<b>1.9%</b>
Terminal Service Units	187.9	189.6	195.7	198.9	203.2	206.9	
% Change	3.0%	0.9%	3.2%	1.6%	2.2%	1.8%	<b>1.9%</b>

The expected annual growth for North Atlantic IFR movements in Irish airspace is slightly less than the forecast for all movements (1.7%). This is consistent with generally observed growth in this traffic flow (apart from the recovery from the 2008-2011 global financial crisis). The expected growth in en route service units (1.9%) is exactly the same as the IFR movements over the RP3 period (with small variations in some years).

For RP3 the growth in terminal service units is projected to be 2.0% within a high low band 3.2% to 0.4% under the latest STATFOR scenarios. The RP2 average annual growth is expected to be 6.4% (2015 to 2018 actuals plus forecast for 2019). This is a very significant decrease and mainly concerns Dublin airport (which accounts for 85% of Irish arrivals and departures). A very significant slowdown on the rates of growth witnessed in the last four years is expected in 2019 (2.8%) and 2020 (1.0%). The current

<sup>8</sup> Source: EUROCONTROL Seven-Year Forecast February 2019  
<https://www.eurocontrol.int/articles/forecasts>

capacity limits of the airport are the most significant factors in this forecast lower rate of growth.

From 2020 the en route service units will be calculated based on the actual profile rather than the last filed flight plan. The new method has not been taken into account in the current STATFOR forecast, the September 2019 forecast (scheduled to be published in October) will provide the service unit forecast based on this profile. EUROCONTROL CRCO has however analysed three months of profiles and the effects of this change of methodology on IAA service units is shown below.

**Table 10 STATFOR Base Projections (adjusted for revised SU methodology)**

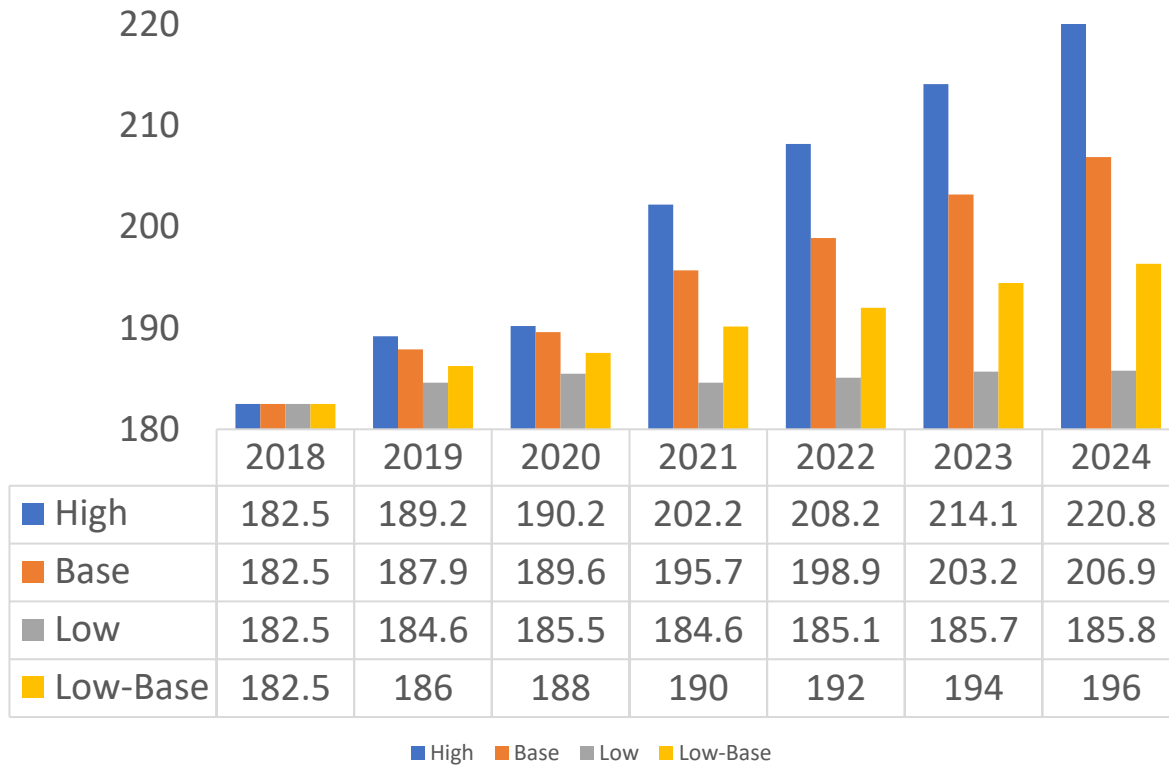
<b>(000s) / % Change</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>AAGR 2020- 2024</b>
STATFOR Service Unit Forecast	1.9%	1.9%	2.1%	2.1%	1.7%	1.7%	<b>1.9%</b>
STATFOR Service Unit Forecast (000s)	4,636	4,724	4,826	4,926	5,009	5,092	
Revised Service Unit Forecast (000s)	4,636	4,689	4,790	4,890	4,972	5,054	
Revised Service Unit Forecast	1.9%	1.1%	2.2%	2.1%	1.7%	1.7%	<b>1.8%</b>
Difference (000s)	0	35	36	36	37	38	
% Difference	0.00%	0.74%	0.74%	0.74%	0.74%	0.74%	

The proposed change of method of calculation of service units in 2020 is expected to reduce the forecast rate of growth of service units from 1.9% to 1.8%. This compares with the low scenario whereby the proposed change of method of calculation of service units in 2020 is expected to reduce the annual forecast rate of growth of service units from 0.6% to 0.5%.

Our Plan runs with the revised STATFOR methodology and opts for the Base STATFOR scenario (1.8% annual growth) which assumes a smooth UK withdrawal from Europe. By comparison, the Low STATFOR scenario projects just 0.5% annual growth and built into this scenario is a hard Brexit.



**Figure 14 Terminal Service Units**



The low scenario foresees a virtual stagnation of terminal service units from 2019 to 2024. This is the effect of the hard BREXIT scenario

From a terminal perspective, we have ensured that the choice of traffic scenario is consistent with that of en route traffic. In line with this, the following points are of relevance as we prepare for RP3.

STATFOR has one scenario that reflects a “Hard Brexit” whereby the UK withdrawing from the EU would have a detrimental impact on traffic. It is considered prudent to plan on this basis given the significance of Ireland-UK traffic.

The north runway at Dublin is scheduled to be operational in the second half of 2021, implying that it will be ready for the peak season in 2022. This infrastructure is an important step towards alleviating the capacity constraints at Dublin Airport but critically will not be in place for the peak seasons in the first two years of RP3.

Other constraints at Dublin Airport including slot capacity issues in the busy hours and associated infrastructure deficits that are affecting the number of stands at Dublin Airport and which are not expected to be completed in full until the end of the RP3 period.

In summary, despite the magnitude of the Brexit-related uncertainty, we have followed the European Commission's Regulation and leaned on the STATFOR Base Case Traffic Scenario, which reflects a smooth withdrawal scenario.

However, should the balance of probability swing towards a hard Brexit later this year, it may be necessary to revise the underlying traffic scenario in line with the revised STATFOR projections.

## 7 Operations Strategy

### **EU Single European Skies RP2 Performance**

As set out throughout this Business Plan, the IAA fully contributed to the achievement of all EU SES key performance indicators during RP2 to date.

#### **Safety**

IAA fully met all safety objectives during RP2. Indeed, 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 IAA has made significant investments in people, technology and processes to achieve the high-quality safety outcomes and culture that has been built up and achieved. However, this requires continual investment, monitoring, training and an ethos of continual improvement.

The combined impact of EU 376-2014, EU 340-2015 and impending EU 2017-373 from January 2020 will see increased demands on current professional staff combining their core activities with additional subsidiary activities (e.g. ATM Occurrence Investigators and Human Factor Local actors etc). This will affect the focus on the new requirements with a significant and unsustainable workload increase from 2020 that will require additional standalone resources.

#### **Capacity**

The IAA contributions to the RP2 UK-IRL FAB performance plan in the area of capacity (en route and airport arrival) were fully met. This achievement is particularly notable considering the exceptional (and unforeseen) increase in traffic during the reporting period.

**Table 11 Average en route ATFM delay per flight (mins per flight)**

Year	RP2 Target	Achieved	Comment
2015	0.13	0.000	No capacity delays, exceptionally minor en route delay due ATC equipment.
2016	0.13	0.000	
2017	0.14	0.001	
2018	0.14	0.002	
2019	0.14	0.000	

**Table 12 Average airport arrival ATFM delay per flight (mins per flight)**

Year	RP2 Target	Achieved	Comment
2015	0.18		Almost all delay due weather and aerodrome capacity. Virtually no ANSP attributable delay.
2016	0.18	0.15	
2017	0.20	0.08	
2018	0.20	0.21	
2019	0.22	0.08	

**Environment**

Targets were established at UK-Ireland FAB level for RP2. These targets and the performance achieved are shown below. Although the UK-Ireland FAB target was not fully achieved it is clear that the IAA contribution was entirely satisfactory.

**Table 13 Average horizontal En route flight efficiency of the actual trajectory**

Year	Target	Achieved		
		Ireland	UK-IRL FAB	UK
2015	3.36%	1.30%	3.48%	3.93%
2016	3.27%	1.40%	3.87%	4.38%
2017	3.18%	1.35%	3.71%	4.15%
2018	3.09%	1.26%	3.64%	4.08%
2019	2.99%	1.19%	3.50%	3.91%

**Summary of RP2 achievements**

**Table 14 En route achievements**

Functional area	Achievement
Airspace Efficiency	<ul style="list-style-type: none"> <li>• Two re-sectorisations of the upper airspace implemented with no delays to customers.</li> <li>• FRA in Low Level airspace</li> <li>• Reductions in longitudinal and lateral separation minima on the NAT implemented:               <ul style="list-style-type: none"> <li>○ Performance-based communication and surveillance PBCS.</li> </ul> </li> <li>• Introduction of extended arrival management (XMAN) to London Heathrow.</li> <li>• 5NM minimum separation area extended to entire airspace from FL290</li> <li>• Continued successful operation of FRA in Shannon FIR</li> <li>• Flexible sectorisation based on traffic flows</li> </ul>
Controller efficiency	Phased implementation of Single Person Operations (SPO) in Shannon ACC Upper and Lower sectors.
Resilience	<ul style="list-style-type: none"> <li>• Introduction of High Level holds in the Upper airspace for contingencies.</li> <li>• Commencement of design, development and implementation of En route contingency centre</li> </ul>
CNS capability	<ul style="list-style-type: none"> <li>• Enhancement of the CPDLC message set.</li> <li>• Introduction of Mode S.</li> <li>• A new comms system introduced with no delays to customers.</li> </ul>
Training	IAA has been certified as an authorised ELPAC (English Language Proficiency for Aeronautical Communication) for air traffic controllers.

**Table 15 Terminal achievements**

Functional area	Achievement*
Technology	<ul style="list-style-type: none"> <li>• New Control Tower construction completed in March 2019. Currently in a 12-month fit-out phase and will enable parallel runway operations at Dublin airport in 2021.</li> <li>• Electronic flight strips (EFS) introduced at Dublin airport.</li> </ul>
Airspace Efficiency	<ul style="list-style-type: none"> <li>• Introduction of Airport collaborative decision making (A-CDM) at Dublin airport on a H24 basis. 6-month network validation phase that will be completed in July 2019</li> <li>• Continued introduction of High Intensity Runway Operations (HIRO) initiatives, reduced departure intervals, dual runway operations at Dublin airport. HIRO initiatives have led to a considerable increase of runway capacity at Dublin airport.</li> <li>• Point Merge RWY10 and continued successful operation of Point Merge RWY28</li> </ul>
Resilience	<p>The IAA completed a SESAR remote tower trial associated with using remote tower technology to provide services at two different airports at the same time. The IAA will be introducing remote tower services for Shannon airport in 2020</p>

\* Further details are provided in Section 9.

### ATM Plan for RP3

The IAA continuously strives to provide a best-in class ATM service to our customers in a safe, cost-effective and efficient manner. Our work force is highly skilled, and we use state-of-the-art technology such as the COOPANS FDP system, which is one of the most sophisticated ATM systems in the world. COOPANS is developed in partnership with the ANSPs of Austria, Croatia, Denmark, Portugal and Sweden and leading ATM system supplier, Thales.

The IAA will continue to support COOPANS upgrades in line with the roadmap as determined by our COOPANS partners. All new and improved processes, procedures and technology progressed during RP3 will be subject to the rigorous application of the IAA's Safety Management System (SMS) and will benefit from the oversight of the Safety Regulator. This approach has served the IAA and its customers very well to date and will continue to do so throughout RP3 and beyond.

One of the main drivers of our Operations Strategy is to deliver the set of ATM functionalities that are obligatory under Commission Implementing Regulation on the establishment of the “Pilot Common Project” supporting the implementation of the European Air Traffic Management Master Plan.

RP3 will also see the introduction into operation of the new parallel runway at Dublin with the new visual control tower. A significant redesign of Dublin ACC airspace and sectors will be implemented, as will modified ground procedures to facilitate the use of the two parallel runways. These will lead to major capacity increases at Dublin airport.

The IAA has a proven track record in providing an excellent service at a cost that is at or near the lowest in the EUROCONTROL area. During RP3, we will continue to provide value for money in ATM service provision, while seeking to ensure that safety, environment and capacity related targets are met.

### **En route Business Strategy for RP3**

The IAA’s primary objective with respect to en route traffic is to deliver safe and efficient services which meet the demands of our customers. This objective is pursued in accordance with the European Commission’s Single European Sky (SES) regulatory framework. During the period 2015 – 2019, en route traffic in Irish airspace has increased by an average of 3.8%<sup>9</sup> per annum. In order to meet the significant increase in demand during this period and continue to deliver the quality of service that our customers expect, the IAA had to focus on core operations, which placed a significant strain on resources, and resulted in some capex delays and other areas of reprioritisation. We have been “catching up” in the last years of RP2 and this catch will continue into RP3, until traffic growth moderates.

The equivalent rate of growth over the period 2020-2024 is projected to be 1.9%<sup>10</sup> according to the most recent STATFOR base case scenario.

To address this growth in traffic and to meet our customers’ demands, a number of measures are planned to ensure that an appropriate level of safety, capacity and environmental efficiency are delivered:

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<sup>9</sup> EUROCONTROL STATFOR 2015-2018 actuals (2019 forecast)

<sup>10</sup> EUROCONTROL STATFOR Seven-Year Forecast - February 2019



- 1.1 Continue the “crew to workload” initiative, reviewing as appropriate, ensuring an appropriate fit between hourly costs and revenue while at the same time, ensuring the economic viability and sustainability of our en route business unit.
- 1.2 Commission the new Contingency En route Operations Centre (CEROC) at Ballygirreen, Co. Clare. 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.
- 1.3 Integrate ground-based and space-based ADS-B into the ARTAS tracker for domestic operations subject to EASA approval. This will facilitate key future capacity, safety and environmental gains.
- 1.4 Implement Aeronautical information exchange (PCP).
- 1.5 Implement Meteorological information exchange (PCP).
- 1.6 Continue to cooperate with ICAO and other stakeholders in the safe reduction of separation standards and other initiatives on the North Atlantic delivering increased capacity, reduced costs and reduced CO2 emissions.
- 1.7 Increase our network management capability ensuring a seamless and efficient gateway between oceanic and continental airspace, deploying a range of traffic management strategies.
- 1.8 Implement extended arrival management at Dublin and facilitate the introduction to other listed airports as required by the PCP.
- 1.9 Expand the CPDLC message set as necessary to increase capacity whilst maintaining or improving safety.
- 1.10 Continue to review and improve our internal dynamic sectorisation to match changes in aircraft performance and routings.
- 1.11 Cooperate with NATS and our Borealis partners to fully implement cross border Free Route Airspace and other initiatives across the nine members states.

We believe that these measures are adequate to deal with the forecast traffic growth while at the same time, maintaining Ireland’s historically low levels of en route delay. In

addition, by continuing to invest in our en route services, we will place our business on a sustainable footing, meeting all national and international regulatory requirements (aviation, environment, employment etc), reduce over-time and allow for appropriate flexibilities to develop to meet changes in traffic growth or pattern. This is positive for our customers and the wider European network.

### **Terminal Business Strategy for RP3**

During the period 2015 – 2019, terminal traffic in Irish airspace increased by an average of 6.4%<sup>11</sup> per annum. The equivalent rate of growth over the period 2020-2024 is projected to be 1.9%<sup>12</sup> under the most recent STATFOR base case scenario. Similar to en route traffic, in order to meet the significant increase in demand during this period and continue to deliver the quality of service that our customers expect, the IAA had to focus on core operations, which placed a significant strain on resources, and resulted in some capex delays and other areas of reprioritisation. In our terminal strategy we propose that the necessary improvements to fully exploit the parallel runways, implement functionalities as required under the PCP, together with other essential improvements will be delivered during RP3 in a timely fashion.

Similar to en route traffic, the IAA's primary objective with respect to terminal traffic is to deliver safe and efficient services which meet the needs of our customers. This objective is also pursued in accordance with the Commission's SES regulatory framework. It is our intention to achieve this objective by the following means:

- 2.1 Implement Departure Management Synchronised with Pre-departure sequencing at Dublin by end of 2020 (PCP)
- 2.2 Implement integrated Surface Management Constraints at Dublin by end of 2020 (PCP).
- 2.3 Introduce the new visual control tower at Dublin in advance of the commissioning of the second parallel runway in 2021.
- 2.4 Implement all necessary terminal procedures and airspace changes to facilitate parallel runway operations in 2021.
- 2.5 Increase flow and network management capabilities through a range of capacity optimisation and ATFM solutions.

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<sup>11</sup> EUROCONTROL STATFOR 2015-2018 actuals (2019 forecast)

<sup>12</sup> EUROCONTROL STATFOR Seven-Year Forecast - February 2019

- 2.6 Implement extended arrival management in the Dublin terminal manoeuvring area by end of 2023 (PCP)
- 2.7 Implement Time-Based Separation for Final Approach at Dublin by end of 2023 (PCP).
- 2.8 Implement Automated Assistance to Controller for Surface Movements Planning and Routing at Dublin by end of 2023 (PCP).
- 2.9 Implement Aeronautical information exchange (PCP)
- 2.10 Implement Meteorological information exchange (PCP)
- 2.11 Implement Cooperative network information exchange (PCP)
- 2.12 Implement Flight information exchange (PCP)
- 2.13 Implement a remote tower facility for Shannon airport at Ballycasey and investigate opportunities for increased efficiency and reduced operational expenditure associated with remote towers at Cork airport.
- 2.14 Continue the “crew to workload” initiative, ensuring an appropriate fit between hourly costs and revenue while at the same time, ensuring the economic viability and sustainability of our Terminal business unit.
- 2.15 Implement the airport operations plan in collaboration with all airport stakeholders.
- 2.16 Work with all stakeholders to ensure the safe operation of UAVs without impacting on safety.

These measures will ensure that the IAA continues to offer a safe, high quality terminal service whilst also allowing the IAA investments in people, technology and processes to “catch-up” with the significant traffic growth from RP2. This will place our service on a sustainable footing whilst also meeting all national and European/ International regulatory requirements in all areas (aviation, environment, employment etc).

## 8 Technology Strategy

### Introduction

The IAA has a wide range of investment projects aimed at delivering service improvements to our customers, through increased efficiency and value for money, while improving safety performance. This is achieved through discussions with our customers, implementing European ATM requirements, and leveraging technology partnerships across Europe. The vision of the IAA Technology Strategy is to meet the operational, safety, strategic and corporate needs of the organisation with the appropriate technology and expertise in a cost-effective manner.

### Strategic Objectives

The Technology Strategy for RP3 has considered a range of key strategic drivers, based on customer feedback and industry knowledge, from Safety and Security to Drone Integration as detailed in the figure below. The Technology Strategy is aligned to deliver upon the Operations Strategy detailed in Section 7.

**Figure 15 Key Drivers of Technology Strategy**



1. Safe and Secure Operational systems. This is achieved through continuous performance monitoring and periodic obsolescence management of operational systems as well as a robust security policy.
  
1. Regulatory Compliance as part of the SESAR Deployment program and other EU Regulations, the IAA is mandated to implement technology changes within an agreed time scale. The technology strategy has taken these requirements into account to ensure they are delivered in a timely fashion. Most of the requirements will be delivered through enhancements to the COOPANS system and electronic flight strip system.

Some examples of the mandated changes required are SESAR Pilot Common Projects PCP's as listed in Section 7 – Operations Strategy:

- a. Implement Aeronautical information exchange (PCP).
  - b. Implement Meteorological information exchange (PCP).
  - c. Implement extended arrival management at Dublin and facilitate the introduction to other listed airports as required by the PCP.
  - d. Implement integrated Surface Management Constraints at Dublin by end of 2020 (PCP).
  - e. Implement extended arrival management in the Dublin terminal manoeuvring area by end of 2023 (PCP)
  - f. Implement Time-Based Separation for Final Approach at Dublin by end of 2023 (PCP).
  - g. Implement Automated Assistance to Controller for Surface Movements Planning and Routing at Dublin by end of 2023 (PCP).
  - h. Implement Aeronautical information exchange (PCP)
  - i. Implement Meteorological information exchange (PCP)
  - j. Implement Cooperative network information exchange (PCP)
  - k. Implement Flight information exchange (PCP)
- 
2. Capacity and Environment, the IAA have a strong track record of extremely low delay (zero). Continuing to achieve this level of performance as traffic grows both in RP2 and into RP3 is a key challenge for our business and accordingly we are planning investments in technology as well as in our people and processes such that this high-quality performance can be maintained over RP3.

A specific example of capacity increase activity for RP3 will be the introduction into operation of the new parallel runway at Dublin with the new visual control tower. A

significant redesign of Dublin ACC airspace and sectors will be implemented, as will modified ground procedures to facilitate the use of the two parallel runways. These will lead to major capacity increases at Dublin airport.

3. Innovation via Digitisation and best practice e.g. via complete migration of the IAA's existing data Communications networks to IP based technology, use of big data and analytics. This will enable operational efficiencies while supporting improved data sharing services with high bandwidth needs, including centralised monitoring, remote towers and optimisation of controller workload via enhanced tools.
4. Strategic Partnerships, the IAA will continue to build on existing strong partnerships such as COOPANS, BOREALIS and EPN. These deliver savings to our customers, help grow innovation and shared expertise as well as fostering the spirit of the Single European Sky.
5. Obsolescence, the IAA will replace systems as they reach end of life to ensure continued safe, secure and efficient operations.
6. Productivity Improvements using technology and innovation to increase operational capacity and productivity.

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.

7. Operational Resilience will be improved both via the availability of contingency systems and business contingency capabilities and ensuring systems are appropriately security protected from unauthorized access.
8. Drones Integration is required with the expected growth in drone operations. It is important that work in this area commences during the RP3 period.

## Key Projects

### New Dublin Air Traffic Control Tower

The daa have 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 were completed March 2019 and the Technology fit out has commenced.

**Figure 16** Progress on Control Tower at Dublin Airport



The New Tower and Parallel Runway project will be the most significant project undertaken by the Authority during RP3.

### COOPANS and Tower FDP Systems

COOPANS is a well-recognised, successful partnership, for procurement of ATM systems amongst 6 ANSP’s (IAA, LFV, NAVIAIR, AUSTROCONTROL, CROATIA CONTROL, NAV PORTUGAL). 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 is in the process of planning for the next generation systems, which will replace our existing FDP. COOPANS are evaluating the new Thales FDP, which will 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. In RP3, the IAA is anticipating a cashflow spend of €20.9m directly attributable to the new Thales FDP. This project is expected to be capitalised over the course of 2023 – 2029.

FDP Tower projects include the implementation of Electronic Flight Strips (EFS) in the Dublin, Cork and Shannon towers. This will enable a standardisation of tower procedures across all three towers and increase efficiency in turnaround times for airline customers.

### **Communications, Navigation and Surveillance (CNS)**

Most CNS projects are driven by obsolescence, resilience and/or capacity/efficiency improvement. The installation of additional radar capacity at Dublin Airport is required to maintain 3NM separation on a continual basis. The IAA is also planning a number of radar upgrades that will extend the life of the existing radar heads. The IAA's Navigational Aids Infrastructure, the ILS (Instrument Landing Systems) have been in service since 2006, and they will be renewed during RP3. The IAA is also over the term of this plan migrating to IP based data communications, including voice-over IP, designed to meet future SESAR and ATM requirements

### **Contingency En route Overflow Centre (CEROC)**

The IAA's new En route Contingency centre will go operational in RP3 and 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.

### **Strategic Partners**

The IAA has several existing Strategic Partnerships which the IAA has forged, and which are delivering real benefits e.g. COOPANS and EPNI. IAA will continue to evaluate further opportunities which can deliver tangible safety, efficiency or cost control benefits.



The IAA regularly meet with existing and potential new partners such that we can drive productivity, safety and cost control.

### **Systems Resilience to Protect Business Continuity**

The IAA are continually seeking to improve systems resilience in order to ensure business continuity and minimise delays. Examples of significant projects over the course of RP3 include:

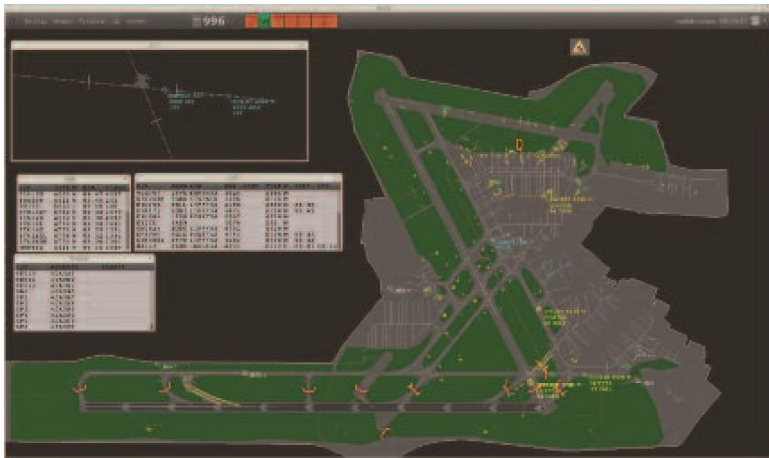
- New Contingency En route Overflow Centre,
- New and Enhanced Backup FDP System,
- New Generator and Uninterruptable Power Supply Systems at Remote Sites,
- Enhanced Systems Monitoring and Control Capability,
- Using Satellite based ADS-B as a backup for ground-based Surveillance Systems.

### **Areas of Innovation**

#### **SESAR Delivery**

As part of the European ATM Masterplan the IAA is mandated to implement the SESAR Deployment Program (SDP) and the associated Pilot Common Projects (PCP's).

The PCP's are divided into a number of specific project areas referred to as ATM Functionalities (AF), focusing on delivering incremental changes across all flight phases from gate to gate. Rather than focusing on improvements in the En route phase only, the PCP are looking at improving performance across the entire network. Technology improvements will be delivered through our COOPANS, EFS, A-CDM and other systems.



### **Airport Collaborative Decision Making (A-CDM)**

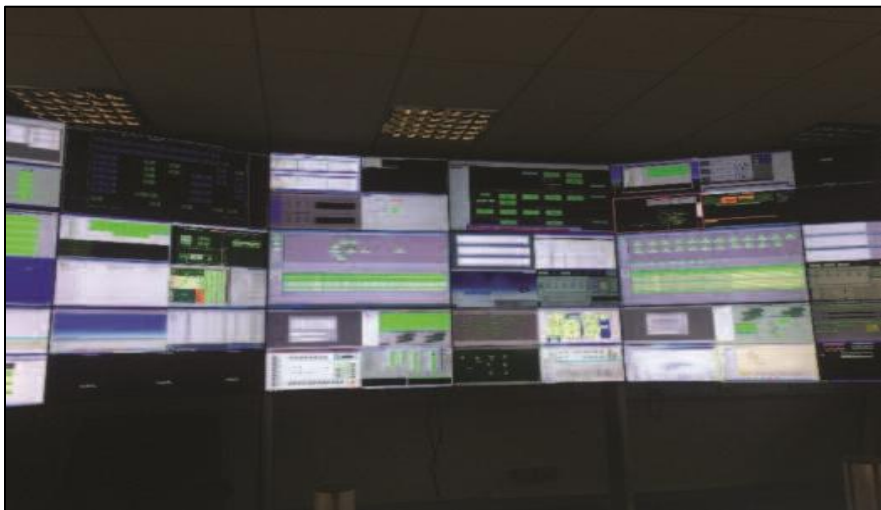
The IAA has engaged with daa and airlines to ensure the concept of operations and associated systems take into account the future growth needs of Dublin Airport. Initial A-CDM has been introduced as part of deployment of the Electronic Flight Strip system with the network elements currently on trial. A-CDM is also considered a key requirement to future Airport efficiencies and is also part of the SESAR Deployment Program.

### **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.



### **Remote Tower**

The IAA aims to implement remote tower technology for Shannon and Cork airports. The remote tower project will enable capability to provide a safe, efficient and cost-effective

ATM service for Cork and Shannon Towers from a remote location based in the Ballycasey Operations Centre.



### **System Wide Information Management (SWIM)**

SWIM is a SESAR Deployment enabler for future netcentric operations, as shown in the diagram, where data is shared between all parties on a needs basis, as opposed to today's data connections which have been implemented on a point to point basis. The IAA are working with our COOPANs partners to explore the opportunities associated with SWIM, such as Virtualisation and Collaboration on Security Policies and Procedures. SWIM along with standardised, interoperable systems will enable virtualisation whereby ATC services can potentially be provided irrespective of the location of the infrastructure. PENS (Pan European Network Service) will be and enabler for SWIM.

### **Expenditure**

The Table below indicates the forecast CAPEX payments for delivering the technology strategy. It details the break down against the Communications Navigations Surveillance and Flight Data Processing Domains.

**Table 16 Value of Capitalised Projects by category**

	Value of capitalised projects					
	2020 €'000	2021 €'000	2022 €'000	2023 €'000	2024 €'000	RP3 €'000
Air traffic management	█	█	█	█	█	120,469
Communications	█	█	█	█	█	13,528
Surveillance	█	█	█	█	█	17,741
Navigation	█	█	█	█	█	12,665
<b>Total</b>	<b>68,703</b>	<b>32,637</b>	<b>16,606</b>	<b>25,525</b>	<b>20,932</b>	<b>164,403</b>

Some of the significant projects making up these totals include:

	Dates of Capitalisation	Value of Project €'000
<b><i>ATM Operations and Technology Projects</i></b>		
New visual control tower and parallel runway at Dublin	2020-2021	█
COOPANS ATM system	2020-2024	█
NAVAIDs replacement programme	2020-2024	█
Next Generation COOPANS (first phase)	2023	█
RADAR replacement at woodcock hill	2024	█
SWIM	2023	█
Voice Over Internet Protocol	2020-2024	█
VHF replacement and frequency expansion	2020-2024	█
North Dublin RADAR	2021	█
Replacement COOPANS hardware	2020	█
NIS directive - system resilience	2020-2024	█
Other ATM Operations and Technology projects	2020-2024	█
<b>Total ATM Operations and Technology</b>		<b>121,593</b>



<b><i>Property, Security and ICT Projects</i></b>		
Plant and equipment upgrades	2021-2024	█
North Dublin RADAR building	2022	█
Upgrade of operational buildings	2021-2024	█
Security upgrades	2021-2024	█
Other property and security projects	2020-2024	█
ICT projects - various	2020-2024	█
<b>Total Property, Security and ICT projects</b>		<b>32,250</b>
<b><i>Projects driven by IAA restructuring</i></b>		
Accommodation fit-out and ICT	2020	█
<b>Grand Total</b>		<b>164,403</b>

### **Rationale underpinning need for additional engineers during RP3**

**New Tower and Runway at Dublin** – This New Tower is a new facility, with power, telecoms, air conditioning, CNS and ATM systems etc. which need to be monitored and maintained. The old Tower will be kept as a contingency so it also needs to be monitored and maintained. The €55M spend is an indication of the scale of the Project. In effect the scale of Dublin airport is close to doubling as the vast majority of traffic currently works off Runway 10/28. When the new 10/28 Northern parallel runway is built it will have new ILS Systems, new ground radar systems etc. The New Tower and Parallel Runway are big drivers for the headcount increase.

**Regulatory Compliance** – As examples there are 2 significant regulatory changes from Jan 2020 (EU Reg 2017/373 and NIS Directive). This will mean more effort on training and competency as well as enhanced security capability.

**Resilience** – We are constantly seeking to improve our systems resilience as we know from talking with our customers that this is a priority area – ranked 3 and inter related with low delay ranked 2<sup>nd</sup>. In this regard for example we are bringing on line a new contingency centre again is a new facility, with power, telecoms, air conditioning, CNS and ATM systems etc. This is just one example of efforts to improve resilience to minimise the risk of delay due to systems outages.

**RP2 Catch Up** – Traffic in RP2 grew more quickly than anticipated and we had to utilise more resources than anticipated on day to day activity at the expense of resource allocation to project delivery. This means we had CAPEX underspend in RP2 which we hand back to airlines. It also means that we have a heavy volume of obsolescence projects and catch up projects for RP3 hence the forecast increase of CAPEX for RP3 over and above RP2.

**System Changes** – Older CNS systems had longer lifecycles, modern systems are server based and require more software patching and updating and this requires additional headcount particularly in a heavily regulated environment where we have to comply with QMS, SMS, SeMS etc. to ensure Quality, Safety and Security.

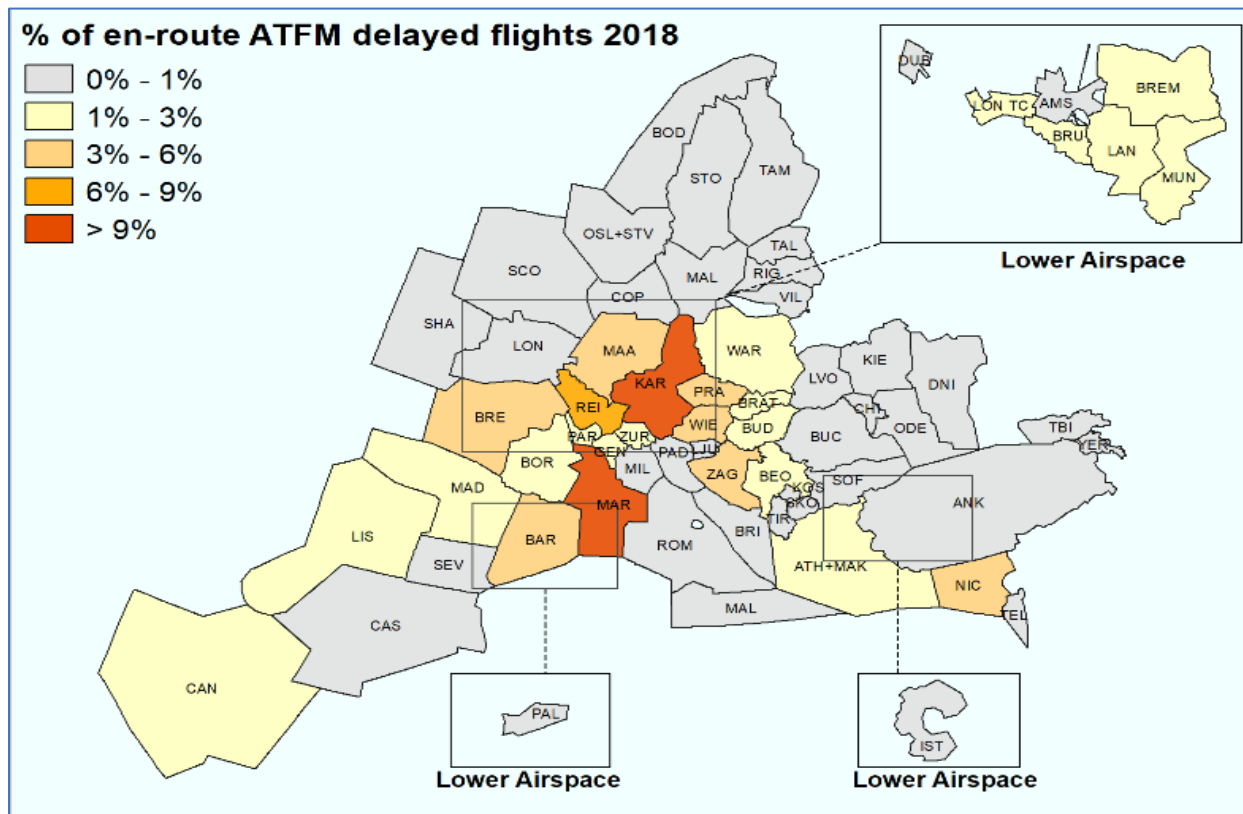
**Traffic Growth** – Continued traffic growth means more sectors, which require more frequencies etc. which means more systems to install, support, monitor and maintain.

## 9 Service Delivery

The IAA has met all of its targets for all metrics (all four KPIs – safety, environment, capacity and cost efficiency) for all of the years of RP1 and RP2 to date. This is a good performance which is contributing significantly to the achievement of the Single European Sky (SES). It is our objective to continue this favourable performance for RP3, based on the requirements and targets set out in this business plan.

Delays continue to be at a minimum, with zero en route ATFM delays for most years of RP2, the only exception being minor delays attributable to a system outage in 2018.

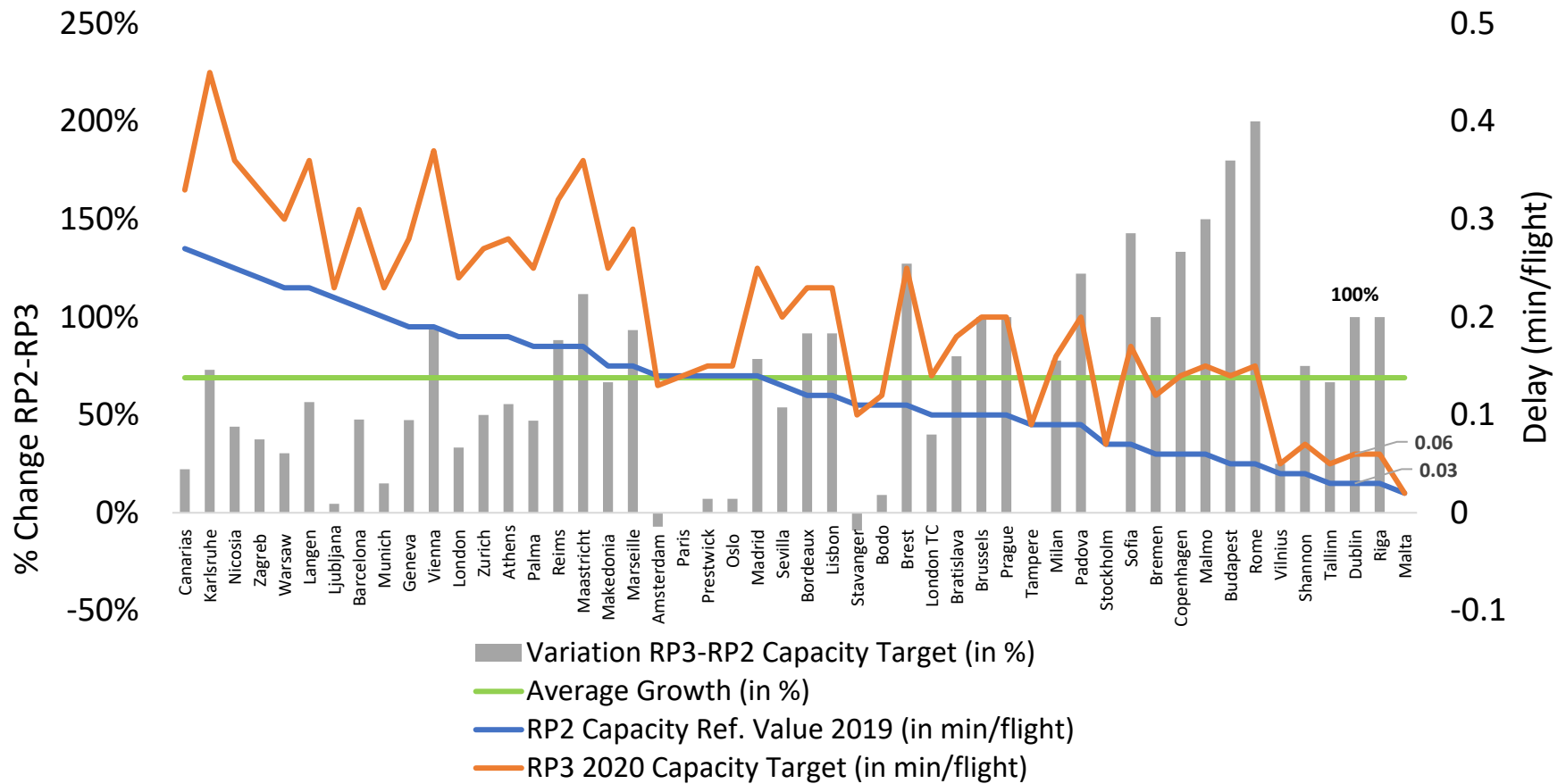
**Figure 17 En Route ATFM delayed flights in 2018**



Source: EUROCONTROL Performance Review Report (PPR 2018)

This chart shows the distribution of delays across the European network in 2019 with Ireland remaining one of the top performers.

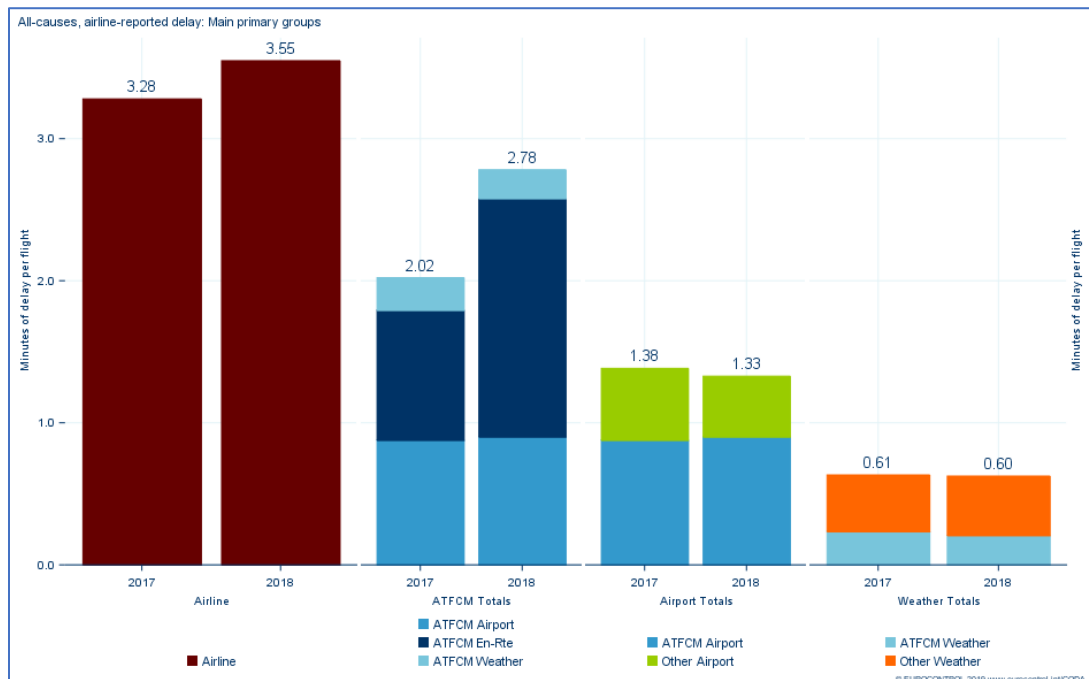
Figure 18 Evolution of capacity targets from RP2 to RP3





It is important that minimising delays is a priority for all ANSPs and indeed for all sectors of the aviation industry. The chart below produced by EUROCONTROL outlines the total increase in delays across the sector and where the delays are attributable. There is a significant need for ATFM delays to be reduced; however there is also an onus on all other parts of the aviation supply chain (airlines, airports, ground handling etc) to work to reduce delays and ensure an improved service to passengers.

**Figure 19 Causes of airline reported delay**



With regard to costs and value for money, the IAA’s en route rate remains one of the lowest in Europe as outlined in the graph below and will continue to do so over the course of RP3, even as costs increase in order to ensure continued service quality. This low unit rate while maintaining a safe and high-quality service is only achievable by being efficient, ensuring staff flexibility and utilising modern technology to deliver benefits to customers.

The traffic increase over RP2 in Ireland and the fact that this caused a strain on available resources and unplanned events such as the need to develop the new tower at Dublin, is a good example of why a more localised focus is needed for the SES Performance & Charging scheme. The pressures and business challenges which the IAA faces in RP3 are different to those in other States. Reflecting this in the implementation of the regulation will provide for better outcomes for customers, as well as improved outcomes for the European network. The network is made up of its constituent parts; only by ensuring that each part is operating efficiently will the whole network operate efficiently.

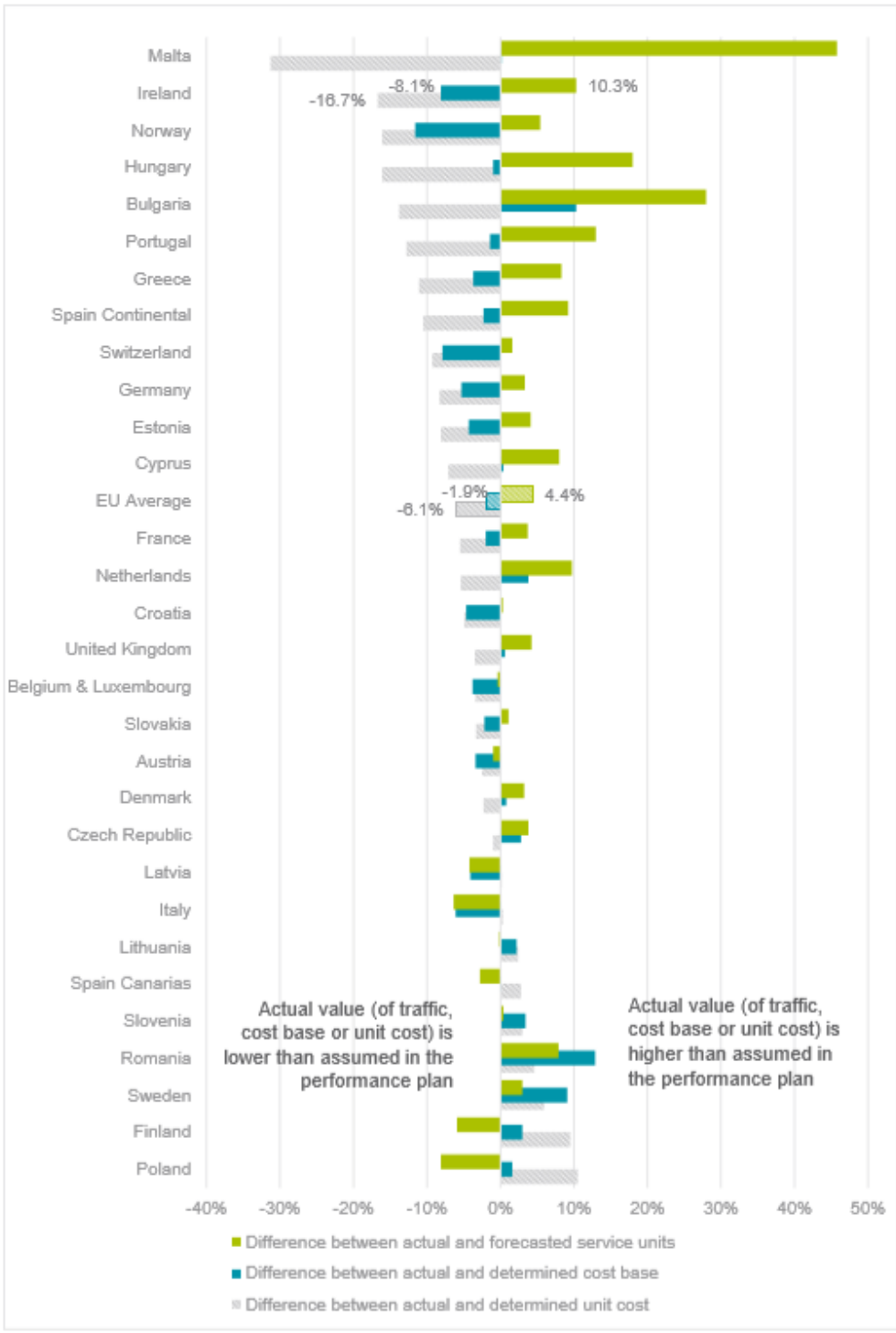
It is important that RP3 finds a balance between the network wide requirements of customers in particular for the level of service quality that they receive in Ireland to be delivered elsewhere and the importance of ensuring that service providers can make the investments in staff, technology, safety and business sustainability.

It is also important that ANSPs make a reasonable return both to remunerate shareholders and to ensure that appropriate investments in the future sustainability of business can be made. This is in the interests of customers also and the SES Performance and Charging Scheme provides for these returns as well as incentivising efficiency. An RP3 plan which pushes for lower costs for already low-cost service providers, whilst increasing the ambition of operational targets will be counterproductive for the SES and customers. Accordingly, it is the IAA's view that RP3 must focus primarily on resolving capacity issues in the core European region.

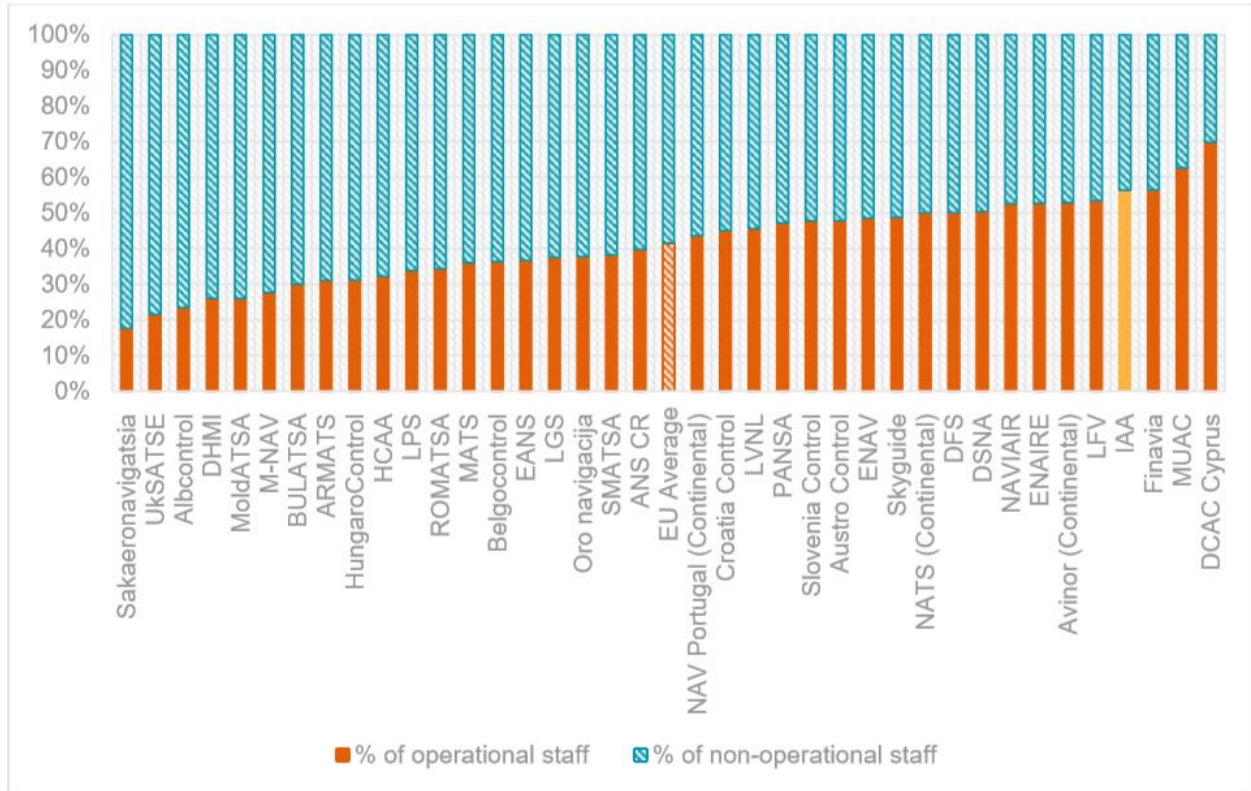
The IAA ANSP's plan for service delivery during RP3 demonstrates how the IAA will continue to deliver a safe and low-cost Air Traffic Management service to our Customers, with the highest levels of efficiency and the lowest levels of delay across Europe.

This section sets out how we will deliver that service in the key performance areas of Safety, Environment, Capacity and Cost Efficiency.

Figure 20 Difference between actual and planned RP2 metrics in 2016



**Figure 21 Balance between operational and non-operational staff**



## Safety

### Overview of ATM Safety

The IAA is committed to complying with all applicable safety regulatory requirements and to striving, whenever practicable, to go beyond compliance and operate to the highest international safety standards. Our task therefore is to provide a safe, efficient and reliable Air Traffic Management (ATM) service to meet the changing needs of our Customers.

Our strategy objective of operating to the highest levels of international safety standards is supported by our participation and engagement with CANSO Europe and Global, EUROCONTROL Safety Teams and associated workgroups. By active participation with the Safety Team’s workgroups and CESAFA Advisory Board we strive in influencing the Commission and EASA with respect to proportionate regulation and realistic and

meaningful performance scheme targets. Moreover, through participation in performance benchmarking and Standard of Excellence safety maturity questionnaire developments, we share our own best practices while implementing those developed in peer organisations, that maintains us both in Europe and globally as a leading ANSP with respect to operational safety performance and maturity.

We seek to achieve continuous improvement to the current high level of safety-management by ensuring that the system is risk-based, systematic and corroborated by objective evidence. It is critical that personnel are appropriately trained and that there are adequate resources to meet traffic demand and adhere to any changes to the regulations

**RP2 Safety (2015-2018) Safety Key performance Indicators**

**Effectiveness of Safety Management (EoSM)**

Following an ICAO continuous monitoring approach audit in 2015, Ireland was ranked second in Europe and fourth in the world for civil aviation safety oversight. In 2016, Ireland maintained its second-place ranking in Europe for civil aviation safety oversight. IAA achieved the joint highest score of the European FAB ANSPs with a safety maturity of 92% in 2017. In the penultimate year of RP2, the IAA achieved Level D with an expected top 5 place with respect to the Effectiveness of Safety Management (EoSM). We were fully compliant with Just Culture and all of the RP2 targets were exceeded.

**Table 17 IAA ANSP EASA EoSM Survey Results 2015-2018**

IAA ANSP EASA: EoSM Annual Measurement survey.		
2015	84%	SES ANSP Average 79%
2016	92%	SES ANSP Average 80%
2017	91%	SES ANSP Average 82%
2018	92%	SES ANSP Average 84%

The EoSM metric will continue to be the key measure of SMS for the remainder of RP2. The IAA ANSP’s maturity is documented with the measurement score of 91% in 2017, being in the top 5 in the SES area. A new version of the EoSM will be an RP3 SKPI, employing more detailed and higher levels of justification and evidence.

The equivalent CANSO/EUROCONTROL 'Standard of Excellence' safety maturity measure assessed globally, places the IAA's performance in this regard, for the second year in succession, at the top of 44 participating ANSPs.

The objective is the continuation of this level of SMS performance in RP3.

### **Risk Analysis Tool**

With regards to the implementation of RAT severity classification methodology, the IAA ANSP adopted this in February 2011 for risk classification of occurrences of Separation Minima Infringement, Runway Incursions and ATM Specific Occurrences (ASO). Since 2012 all occurrences of Separation Minima Infringement and Runway Incursions have been analysed using RAT. Similarly, ATM Specific Occurrences (ASOs) of ESARR severity classification "C" and above have also been analysed. Since 1st January 2015, all ASO occurrences have been analysed using RAT. The TOKAI which integrates RAT was successfully deployed in 2018, supporting the enhancement of our safety intelligence processes and focused safety performance improvement activities through this particular integration and overall safety tools strategy.

### **Just Culture**

In the area of Just Culture, defined as "A culture where staff are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but where gross negligence, wilful violations and destructive acts are not tolerated", we recognise that it must be just for the individual staff member, the IAA and our Customers. We will continue to embed a recognised Just Culture into the organisation, where all are clear about what is expected of them in a Just Culture environment.

We will ensure that Just Culture training is cascaded from the leadership level throughout our organisation. Particular focus will be placed on the training of appropriate senior management and those personnel required to undertake safety occurrence investigations. The training will incorporate appropriate personnel from the top level to the newest recruit and will be tailored accordingly, whilst simultaneously recognising that the just culture training objective will be achieved through open engagement across a mix of seniority and specialism.

The IAA ANSP will ensure that this training is maintained on an on-going basis by including within our documented staff training and induction programmes. The training has been effectively implemented during RP2 to date with delivery of significant progress demonstrated by 2017. The training shall be delivered in a manner appropriate to the

individual staff members with 100% of identified staff completing their training by 31st December 2019.

### **Corporate ATM Safety Strategy 2016-2020.**

The ANSP has made very significant progress to date towards meeting the strategy's Safety Goals in all 4 thematic elements of the strategy. The IAA ANSP already has a strong and effective SMS in place, which is enabling us to achieve the SES RP2 target "Level D" of measured maturity, well in advance of the 2019 RP2 deadline. While this is an important achievement, the ATM Safety Strategic Plan is designed to build upon this and to concentrate our ATM safety efforts across a range of key focused activities. The focus in 2019 is now on reviewing our current processes so as to enable the ANSP to meet the new and significant regulatory and RP3, requirements that are effective from the beginning of 2020.

**Table 18 Thematic Safety Elements and Strategic Safety Goals**

SAFETY THEMATIC ELEMENTS	STRATEGIC SAFETY GOAL
<p>PEOPLE CREATE SAFETY</p> <p>1</p>	<p><b>Safety Strategy Goal 1:</b> Challenging ourselves as an organisation, we will initiate and complete our second Safety Culture Survey. In the context of providing a Safe and Quality Service, this action will enable us to enhance our Safety Culture by cultivating an organisational wide Safety Ethos, rather than focusing solely on Operational Safety.</p> <p><b>Safety Strategy Goal 2:</b> This goal's objective is to empower the Team Safety Reps by developing their proficiency and capability through the provision of bespoke SMS Education modules. This will enhance their knowledge as <b>Subject Matter Experts</b>, facilitating and supporting the communication of their valued input to the SMS.</p> <p><b>Safety Strategy Goal 3:</b> We will minimise our operational risks associated with 'The Human Factor' to as low as reasonably practicable by application of established and validated Human Factors analysis techniques and methods, while providing resilience within our ATM functional system. We will achieve this by identifying and training HF actors to a sufficiently high standard enabling the and integration of these methods with our currently established and matured SMS processes, while maintaining operational effectiveness.</p>
<p>SAFETY INTELLIGENCE</p> <p>2</p>	<p><b>Safety Strategy Goal 4:</b> We will acquire and deploy operationally, a range of the latest Smart Safety Tool applications and technology, that will significantly enhance our monitoring, measuring and analysis of the safety performance of our system, while at the same time making the most efficient use of our available resources supporting a Tailored and Proportionate approach to these critical safety performance activities.</p>
<p>TAILORED &amp; PROPORTIONATE</p> <p>3</p>	<p><b>Safety Strategy Goal 5:</b> To ensure that we apply our resources in as an efficient and focused manner as possible, we will fully utilise our specialist data analytics function and the output of the Safety Tool applications at our disposal to provide the necessary Safety Intelligence to its greatest effect. This aim of this goal is to enable continuous safety performance improvement while simultaneously contributing nationally to the industry's Total System Safety efforts in a Tailored and Proportioned manner.</p>
<p>CHALLENGING &amp; LEARNING</p> <p>4</p>	<p><b>Safety Strategy Goal 6:</b> We will implement an 'E' Learning process to meet effectively, efficiently and economically our SMS educational and training requirements for all staff appropriate to their level of operational activity i.a.w. RP 2 regulatory requirements. This strategy will be rolled out and implemented in year 1 and 2 of the Strategy Period and will be based on, or similar to, an evolution of the current successful CBT application in use for ATSEP.</p> <p><b>Safety Strategy Goal 7:</b> We will develop processes that will provide us with on-going understanding and assurance of how our system and professional staff perform. This will be achieved by implementing an enhancement of our ATCO standards and competency and standards checking through the employment of a continuous assessment process, supported by the utilisation of an embedded non -jeopardy Normal Operational Safety survey methodology.</p> <p><b>Safety Strategy Goal 8:</b> Through participation in various Safety forums and workgroups, we will by collaboration and proactive engagement with those of whom we share risk, ensure that we can effectively address the issues that affect the total system. This strategy goal will also facilitate the continuous improvement provided our Lessons Learned process.</p>



Our ATM Safety Strategy sets out three key areas of activity in order to deliver upon this objective; Safety Culture Survey, Safety Communications and Human Factors:

### Safety Culture Survey

Safety is the responsibility of all employees in the IAA and a safety culture is designed to ensure that all employees take ownership of enhancing safety in their daily work. Challenging ourselves as an organisation, we initiated and completed our second Safety Culture Survey in 2016 with the assistance of EUROCONTROL and the London School of Economics. The Safety Culture and HR 'Wellness' surveys delivered symbiotic action plans that addressed the many common areas identified in both reports.

This approach was validated globally by the CANSO Standard of Excellence (SOE) moderation team in 2018. The ANSP's SMS relevant 7-point action plan was initiated in late 2016 and is now complete. The approach has enabled us to cultivate an organisational wide safety and wellness ethos, rather than focusing solely on operational safety. In accordance with best practice and to ensure the continuing development of our Safety Culture we will plan the next ANSP survey for activation in late 2020.

### Safety Communications

We will continue to evolve and mature our Safety Communications Network at operational unit level, empowering individuals to support bottom-up initiatives to drive safety performance improvement. This involves empowering the Team Safety Reps (TSR) through the provision of bespoke SMS Education modules. This will enhance their knowledge as Subject Matter Experts, facilitating and supporting the communication of their teams input to the SMS. The TSR concept is continuing to embed in the local operational units' safety management systems. Annual education and Safety Management System refresher training will become a focused activity in 2020, supported by the Safety Management Unit, utilising our online eLearning 'Brightspace' platform.

### Human Factors

Human Factors and human performance have become increasingly important areas of analysis when considering ATM safety performance. The IAA has developed a Human Factors (HF) Policy and a Procedures document during RP2 which was initially implemented in 2017, coinciding with the commencement of externally provided HF specific training for local 'actors' operating at unit level.

The strategy's objective of creating a specialised HF expert function in the Safety management Unit has now been achieved with employment of a HF Expert at the

beginning of 2019. This now affords us with an in-house specialisation and expertise to support local HF actor activity at the unit level. In addition, it provides the ANSP with the capability to conduct HF assessments to all changes to the ATM system supporting deeper levels of safety assurance.

During RP3, we will also use this specialisation to support the evolution of our safety investigation process, through the application of focused Human Factor analysis, to go beyond to compliance so as to fully understand how best to provide continuous safety performance improvements in a focused and efficient manner. This strategy will enable a high level of feedback that will drive tailored safety performance enhancements, through focused training and procedural improvements.

### **Safety Performance Analysis**

The IAA's Safety Management Manual requires each operational unit to conduct a mitigating /improvement activities based on trend analysis of occurrence data and to report the results in a standard Quarterly Operations Safety Report. These reports monitor trends in their top five local Key Risk Areas (KRAs) of:

- 1) Separation minima infringement;
- 2) Runway incursions;
- 3) Unauthorised penetration of airspace;
- 4) Deviation from ATC clearance;
- 5) Level Bust.

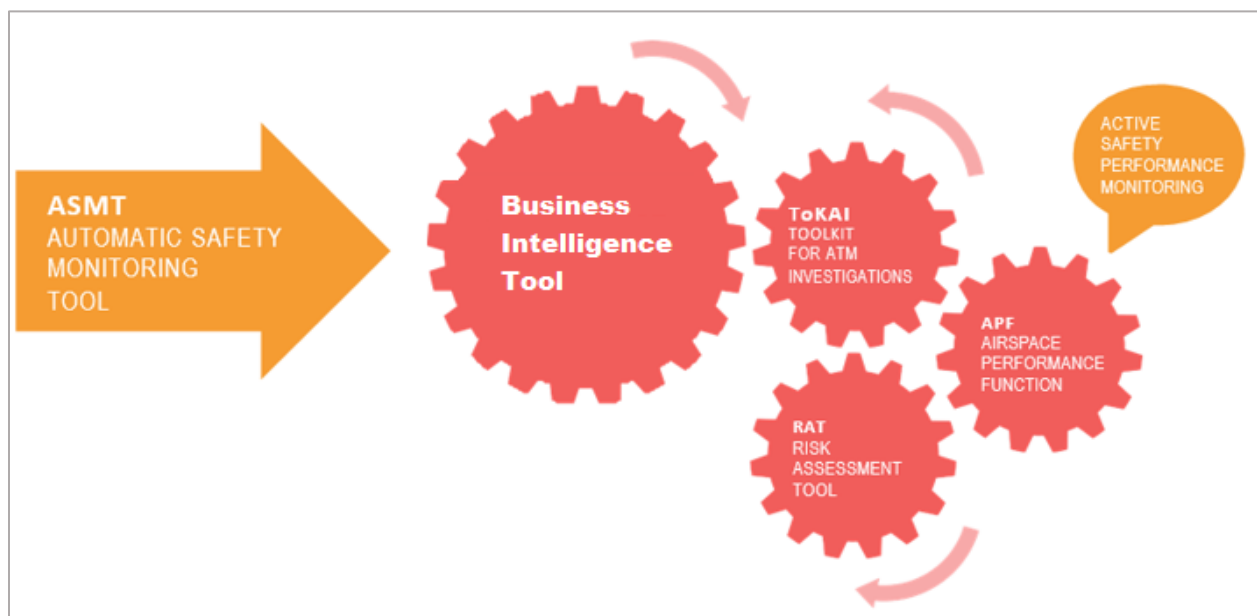
The Safety Management Unit through its specialist analyst function, provides the data and analysis reports to support the operational units in this essential activity. The IAA will continue to strive for a reduction in the rate of occurrence of events in these KRAs by targeted training and awareness campaigns for both internal and external stakeholders and will ultimately support the achievement of the Union-wide targets for RP3.

We have successfully pursued the above safety goals during RP2 to date and intend to review and progressively update these during RP3.

## Safety Intelligence

The IAA ANSP employs a range of tools, applications and indicators to enhance our ATM safety monitoring, measuring and analysis. These tools central to which is our integrated Business Intelligence tool, assists in building our safety intelligence, which informs safety actions and future decisions. These activities are a CANSO recognised and validate ‘Best Practice’.

**Figure 22 IAA Safety Tool Applications**



The IAA ANSP uses smart safety tools such as TOKAI, RAT and APF to measure safety performance against various lenses and to analyse the factors behind safety occurrences or trends (positive or negative). The diagram above indicates the interaction between the various safety tools and applications, which the IAA uses. Utilising information from these tools also positions us to move towards a Performance-Based Environment and Risk Based Oversight.

The Aerospace Performance Factor (APF) and the RAT tools are now fully operational and integrated with TOKAI. The APF Mindmaps were re-weighted for the National APF and in addition, Unit specific APF Mindmaps were created to more accurately reflect unit risk weightings for their own specific operational environment. Securing fully this Strategic Plan objective will enable an advanced process for monitoring unit specific Safety Performance and Analysis. The occurrence investigation and reporting tool – TOKAI, was fully deployed in Q2 2018 and integrated with the ‘TARGIT’ the Business Intelligence (BI)

Tool. The output of this integration is the development of ‘real time’ safety performance ‘dashboards’, which has enabled the achievement of an EoSM Level ‘E’ continuous improvement in 2018 in addition to validation by CANSO Global as a Standard of Excellence Best Practice.

New versions of the TOKAI and BI tool will be deployed in the 2020-2023 delivering further improvements to the overall integration and therefore Safety Intelligence activities.

### **Preparation for RP3**

This section sets out a list of key actions that are required by our Safety Management Unit in preparation for RP3. A sample of initiatives are listed below that we have committed to:

- Monitoring the effectiveness of the current Safety Culture Action Plan outputs and commence planning the next company-wide survey in 2019 for initiation in 2020;
- Continue to develop the Team Safety Reps capability through the provision initial and refresher SMS training/education, thereby maintaining their level of SMS knowledge and necessary skills to communicate and assist in driving unit safety performance improvement: annually.
- Develop and deliver the HF training /education necessary to meet the 2017-373 requirements for initial and refresher training.
- Utilising the HF expert and complete the practicable application training of all local Unit HF actors in order to integrate Human Factors assessment into the IAA’s SMS ‘change assessment’ processes: 2019-2021.
- Providing HF education and analysis training to the ATM Occurrence Investigators to enhance the quality and granularity of our investigation outcomes: 2019-2020.
- Publish our finalised HF policy and process in Q1 2019. The Policy and processes will provide the platform to support the future development of our change assessment and occurrence analysis processes, in accordance with current and future regulatory requirements and industry best practice: 2019-2023.

With respect to improving safety intelligence, we intend to deliver on the following key actions:

- Further developments of integrated TOKAI, BI and APF utilising the new versions of the tools, to further enhance our advanced Safety Performance Dashboard quality and content; 2019-2023;
- Complete the acquisition of the ASMT which will be installed on our COOPANS system, allowing for automatic monitoring of occurrences using operational data: Testing and drafting policy and Operational Concept documentation will be conducted in 2019, with the full operational use implemented at all units in 2020-2021, supporting an overall high-quality Safety performance monitoring and analysis capabilities;
- Enhancing the utilisation of the re-weighted severities in National and Unit specific APF, exploiting fully the capabilities provided by the integration with the TOKAI and BI tool, to provide APF Unit specific weighted performance functionality.

In delivering the above requirements, our Safety Management Unit will continue to be committed to considering Safety as a Business or Enterprise process that is operationally applied and tactically implemented. In order to maximise safety and cost effectiveness of our operations we have considered the totality of the change to the operations of the business and not simply any one or a combination of certain elements i.e. safety, environment, cost efficiency and capacity. Certain interdependencies considered are set out below.

### **Interdependencies**

The progressive safety maturity and performance during RP2, have been achieved through the implementation proportionate and focused strategies. These successful efforts however, have required additional financial investments to ensure that necessary structures and essential specialists dedicated staff were available to achieve these levels of improvements to the SMS.

RP3 will present significant challenges to meet the set KRA targets in tandem with the impact of the new 2017-373 regulatory compliance requirements. The areas that will challenge the current SMS and line operational management structures are as follows:

### **Safety Key Performance Indicator- EoSM.**

This SKPI, utilising an advance version of the RP 2 EoSM questionnaire is significantly expanded demanding increased granularity, justification and evidence to meet the set target Levels. A good example of this demand is Level D for target for *Safety Risk* that will present a particular challenge due to the impact of the related 2017-373 *Management and Oversight of Change* regulation, with its attendant process complexity and departure from current process requirements. This will make achieving this EoSM Level very demanding, necessitating specific focused resources a with sustained availability for training, implementation and application of procedures going forward.

### **Human Factors & Fatigue Risk Management**

The ATCO roster compliance requirements of EU 2017-373 and the associated FRM /FRMS necessitates additional and new processes, expertise and management oversight. The impact on the changes is centred on additional resources for dedicated expertise and technology i.e. roster tool with IT potential to support FRM.

### **Technology and Innovation**

ASMT (Air Safety Management Tool). A key development activity identified in this plan requires technical and IT support and dedicated safety management activities for the deployment, oversight and analysis enabled by the tool for airspace performance and hotspot identification. This initiative is intended to support safety performance improvements and airspace efficiency.

### **Regulatory Impact**

Is summary, the impact of the combination of EU 376-2014, EU 340-2015 and impending EU 2017-373 from Jan 2020, will see increased demands on current professional staff combining their core activities with additional subsidiary activities (e.g. ATM Occurrence Investigators and Human Factor Local actors etc). This will affect the focus on the new requirements with a significant and unsustainable workload increase from 2020 that will require additional standalone resources.

## Summary

The issues that affect the SMS, Operations and the associated interdependences, have been identified and analysed in a separate paper 'Status of SMU and Operational SMS - RP3 Requirements'. The resource requirements are contained in the report with additional Safety Management and SMS support staff for operational units in addition to 7 FTE ATM Occurrence Investigators posts.

While substantial developments and improvements were achieved within current resources in RP 2 experience demonstrated that consistent high levels of SMS activities attained was not possible to sustain across the spectrum of activities. Therefore, to continue the progression of our successful developments and performance since RP 1 the issues highlighted above must be addressed for RP3.

## Environment

IAA's obligations as part of the UK-Ireland FAB were delivered to contribute to the joint FAB wide RP2 targets for enroute flight efficiency – the IAA and NATS have worked well together in delivering projects that resulted in environmental benefits and savings to the airline in terms of reduced fuel burn and time. During RP2 to date the IAA has implemented various energy reduction initiatives, reducing emissions and energy costs. Its Free Route Airspace and Point Merge initiatives contributed significantly to reducing carbon emissions by aircraft over Ireland.

The IAA has achieved all that is possible in terms of horizontal flight efficiency with the implementation of free route airspace in both the Upper and Lower airspaces. Further improvements in this area are dependent on the introduction of Free Route Airspace in neighbouring airspaces with the accompanying system upgrades to enable full cross border FRA. Cross border FRA will be implemented on a phased basis with NATS and is due for full implementation by 2022.

Reductions in NAT separations and our ability to handle more condensed traffic flows has led and will continue to lead to more aircraft being able to fly optimum vertical and horizontal profiles across the Atlantic.

Traffic at Dublin airport has been growing rapidly over the last five years. With the current single runway operation and the limited ground infrastructure, delays in the approach phase (extended track miles) and on the ground for both arrivals and departures have been steadily rising. The implementation of the additional parallel runway, provided this

is accompanied by significant stand, apron and taxiway improvements will lead to major reductions in delays and thus in environmental emissions. The IAA is reassessing the Dublin terminal airspace and associated arrival and departure procedures with the objective of facilitating the most efficient use of the parallel runways with the least possible environmental impact.

IAA is participating in the EUROCONTROL CCO/CDO task force that is drafting a “Joint Action Plan on Continuous Climb and Descent Operations”. The IAA will fully implement the elements of this action plan to the largest extent possible. Such improvements will only be possible in a partnership between the ANSP and the user airlines and depends on the implementation of the second parallel runway at Dublin. IAA will review the CCO/CDO at all three state airports and at the regional airports. Specific CCO/CDO targets will be set following the establishment of a suitable metric that correctly reflects ANSP possibilities.

We are assisting daa and its noise consultants (Bickerdike Allen Partners) concerning the assessment of noise profiles for future arrival and departing routes for the new parallel runway.

Subject to validation using simulation models the following environment targets will be set for achievement by the end of RP3:

**Table 19 Environmental targets for RP3**

Measure	2018 value	RP3 target
Horizontal flight efficiency actual profile	1.19%	1.00%
Continuous Descent Operations	30.4%	To be defined
Continuous Climb Operations	80%	To be defined
Additional taxi out time	7.11 minutes	5 minutes
Arrival Sequencing and Metering (ASMA) additional time	3.10 minutes	2 minutes



## Capacity

### RP2 Capacity (2015-2018)

IAA has succeeded in meeting the RP2 en route and airport arrival capacity targets. This has been achieved however by the extensive use of overtime and limitations on the availability of annual leave and the withdrawal of operational staff from participation in capital projects (see Section 4 below).

More than 40% of the traffic through Shannon controlled airspace is Eastbound transatlantic traffic. Such traffic cannot be subject to ATFM measures and sufficient ATM capacity and staffing must be provided on a daily basis to cater for the traffic flows. The structure of the North Atlantic tracks is dependent on the position of the jet stream however, on average more than 90% of traffic goes through Irish controlled airspace. There is therefore no trade-off between delay and capacity for this critical international traffic flow.

The Network Operations Plan 2019-2024 as approved by the Network Management Board (NMB) recommends that Ireland plans according to the baseline traffic growth capacity profile scenario.<sup>13</sup> These capacity profiles require an increase of 12% and 6% in the hourly capacities of Shannon and Dublin Air Traffic Control Centres respectively over the period of RP3. This is an ambitious target and will require additional resources.

During RP2 ATFM arrival delays have largely remained within targets (see

Table 12 above). Most ATFM arrival delays have been due to weather and aerodrome capacity issues. However other airport related performance indicators have significantly deteriorated during RP2 as traffic at Dublin has increased. The average Arrival Sequencing and Metering (ASMA) additional time has increased from 2.56 minutes to 3.10 minutes (2015 to 2018). Vertical flight efficiency as measured by the proportion of flights that have continuous descent has decreased from 36.8% to 30.4% (2015 to 2018), additional taxi out time has increased from 5.39 minutes to 7.11 minutes (2015 to 2018).<sup>14</sup>

Whereas the deterioration in the above has not been due to ATC capacity, it is imperative that sufficient ATC staff are provided to exploit the new second airport runway and taxiway configuration and provide for increased traffic during RP3. Parallel runway operations require dedicated departure, arrival, surface movements and clearance delivery

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<sup>13</sup> Source: NMB 24 Final Summary results

<sup>14</sup> Source EUROCONTROL PRU Pan-European ANS Performance Data Portal

controllers and provisions to provide such staffing – with the resultant capacity gains have been included in this Business Plan.

### **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 CO<sub>2</sub> 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 CO<sub>2</sub> emissions.

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

Shannon implemented two internal system sector redesigns to better match internal dynamic sectorisation options with changes in traffic flows and aircraft performance of the upper airspace with no delays to customers.

Resilience and safety have been enhanced with the introduction of High Level holds in the Upper airspace for contingency purposes. Other enhancements include the introduction of a "listening squawk" or Frequency Monitoring Codes which enables ATCOs to alert pilots operating outside controlled airspace of their proximity to the boundaries of controlled airspace.

CNS (Communications, Navigation and Surveillance) capabilities were continuously upgraded with enhancements of the Controller Pilot Data Link Communications (CPDLC) message set and the introduction of Mode S. Mode S allows the ATCO to view data directly from the cockpit via Downlinked Aircraft Parameters (DAPs). This information includes the flight level as input by the pilot as well as the speed and heading of the aircraft. Mode S is a significant safety enhancement and has been a key factor in the reduction of level busts.

A new Voice Communications System (VCCS) was also implemented at the Shannon ACC without the need for any ATFM measures.

### **Terminal Services**

The new Dublin Visual Control Tower construction was completed in March 2019 on schedule and on budget. The tower is currently in a 12-month fit-out phase and will enable parallel runway operations at Dublin airport in 2021.

Electronic Flight Strips (EFS) were introduced at Dublin airport in March 2018, automating the manual strip processing function. EFS improves the efficiency and safety of Tower Operations through the programming of strict business rules and introduction of additional safety nets and acts as an enabler for the introduction of Airport Collaborative Decision Making (A-CDM) at Dublin Airport.

The IAA is a key partner in the introduction of A-CDM at Dublin airport on a H24 basis. A-CDM is currently undergoing its 6-month network validation phase that is due for completion in July 2019. Early results indicate a more consistent adherence to Calculated Take Off Times (CTOT) with the compliance rate at Dublin now averaging over 95% year-to-date. This will lead to long term significant punctuality and predictability improvements. Following the successful implementation of Point Merge for Runway 28 in 2012, the point merge arrival procedures were implemented for Runway 10 in 2015. Point Merge streamlines the way in which aircraft are sequenced to land using new techniques to assist airlines to fly in continuous descent approaches (CDAs) to the runway. It has reduced the need to put aircraft into traditional, circular holding patterns and greatly reduced aircraft fuel burn and CO<sub>2</sub> emissions.

Incremental increases in runway throughput have been achieved by the continuing expansion of High Intensity Runway Operations (HIRO) initiatives. In particular, the IAA has introduced Reduced Departure Intervals at Dublin airport. Besides environmental benefits in the form of reduced fuel burn and CO<sub>2</sub> emissions, HIRO also helps to reduce ground noise.

By means of the excellent dedication and productivity of the IAA staff working with other stakeholders at Dublin Airport and the important improvements implemented throughout RP2, the IAA has been able to increase the absolute capacity of the airport considering its current runway, taxiway and parking stand capability.

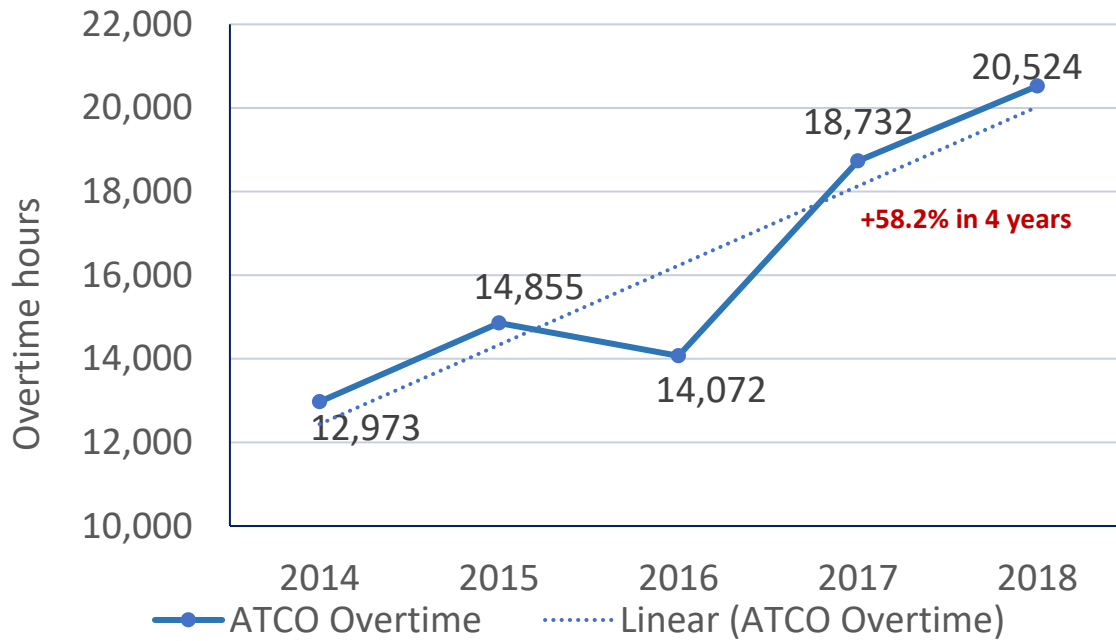
The IAA completed a SESAR remote tower trial associated with using remote tower technology to provide services at two different airports at the same time. The IAA plans to introduce remote tower services for Shannon airport commencing in 2020.

### **Required Resources during RP3 to safeguard future capacity**

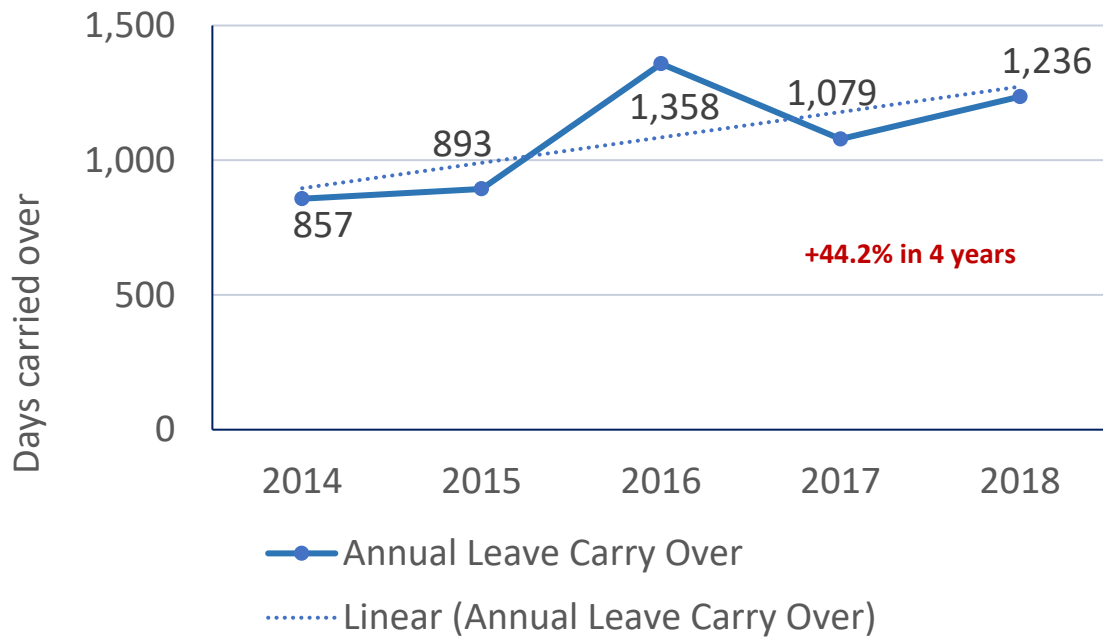
While traffic growth is the primary driver for increasing staff numbers, there are a number of other factors which also place a demand on resources. These factors include, in addition to the provision of a safe operational service, safety work, project work, on-the-job training, competency assessments and regulatory requirements. In addition, legal entitlements which are beyond the control of the IAA also place demands on resources such as the recent new paid parental leave and benefits announced by the Irish government. This new benefit, which is in addition to current maternity and paternity benefits, offers two weeks' paid leave to both parents in employment during the first year and will come into effect from November 2019. Ultimately, parents will be able to benefit from seven weeks' leave each under the scheme as it develops incrementally over the first three years of RP3.

While the IAA has safely handled record levels of traffic which were far in excess of the levels forecasted in our RP2 plans with only a modest increase in staff numbers, continued traffic growth cannot be handled indefinitely without increasing operational air traffic controller and engineering numbers. During RP2, while ATCO numbers remained stable, ATCO overtime levels and Annual Leave carry over levels grew to unsustainable levels.

**Figure 23 ATCO Overtime Totals (Hours)**



**Figure 24 Annual Leave Carry Over (Days)**



Besides RP2 traffic growth rates far exceeding our forecasts (Terminal + 16% over the RP2 forecast & En route 8.6% over the RP2 forecast), our RP2 plan also underestimated the resource effects of regulatory changes (Regulation (EU) 340/2015), government parental leave entitlement changes, ATM Occurrence Investigation (AOI) work, safety work and systems testing & validation works. Our CAPEX underspend for RP2 will exceed €20 million which is mostly due to the lack of engineer and ATCO resources required for certain projects.

We do not want to repeat this again for RP3 and we want to better position ourselves to safely handle traffic growth while at the same time completing project work and complying with our legal, safety and regulatory demands.

From the end of 2019 to the end of RP3, we need to increase the number of ATCOs from 313 to 346. This includes the staffing requirements resulting from the new Dublin Tower and Parallel Runway Operations. The 2024 ATCO figure of 346 represents a 10.5% increase in ATCO numbers over the end of 2019 total. This compares very favourably with the 9.9%<sup>15</sup> growth in traffic and the other demands on our resources identified above during RP3.

**Table 20 ATCO requirements for RP3**

2019	2020	2021	2022	2023	2024
313	325	333	338	338	346

During RP3 we also need to increase the number of Data Assistants (DA) from 37 to 45. In addition to supporting the delivery of the operational service; DAs support training, airspace development work, project work and they staff the Aeronautical Information Management (AIM) service. As we evolve from the paper-centric Aeronautical Information Service (AIS) to a data-centric AIM service, with a resulting increase in the range and scope of the aeronautical information provided including the roll out of the Aeronautical Surface Screening Evaluation Tool (ASSET) and charting requirements, a need for additional DA resources has been identified.

<sup>15</sup> Cumulative effect of average 1.9% growth over 5 years

**Table 21 DA requirements for RP3**

2019	2020	2021	2022	2023	2024
37	43	45	45	45	45

Regulation (EU) 2017/373<sup>16</sup> will apply from the 2<sup>nd</sup> of January 2020. This regulation updated common requirements for ANSPs’ service provision during RP3. While the full resource implications of this regulation are still being determined, further resources will definitely be required to ensure that our ATCO rosters meet the Fatigue Risk Management provisions and the requirement for the establishment of a Compliance Monitoring function contained therein.

We underestimated the resource implications of Regulation (EU) 2015/340<sup>17</sup> in the areas of training course preparation, instructor provision and the regulatory training process and we need to ensure that this does not occur again.

Recruiting and training ATCOs takes over two years. From an operational perspective, we need to start recruiting and training ATCOs from mid-RP3 to ensure that we will have sufficient staff to prepare for a significant increase in ATCO retirements projected for RP4.

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<sup>16</sup> Commission Implementing Regulation (EU) 2017/373 of 1 March 2017 laying down common requirements for providers of air traffic management/air navigation services and other air traffic management network functions and their oversight, repealing Regulation (EC) No 482/2008, Implementing Regulations (EU) No 1034/2011, (EU) No 1035/2011 and (EU) 2016/1377 and amending Regulation (EU) No 677/2011

<sup>17</sup> Commission Regulation (EU) 2015/340 of 20 February 2015 laying down technical requirements and administrative procedures relating to air traffic controllers' licences and certificates pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council, amending Commission Implementing Regulation (EU) No 923/2012 and repealing Commission Regulation (EU) No 805/2011

## Cost Efficiency

In order to put the performance of the IAA during RP2 into context, we will use two data sources for comparing cost efficiency performance:

1. En route Unit Rates
2. The Air Traffic Management Cost Effectiveness (ACE) report

The Air Traffic Management Cost Effectiveness (ACE) report is produced annually by the EUROCONTROL Performance Review Commission (PRC). This report covers 38 ANSPs within the Pan-European region and analyses each ANSPs' cost effectiveness and productivity considering only those costs that are directly under the ANSP's control. The latest available version of this report contains 2017 data and was published in March 2019.

The PRB is obliged to provide ANSP comparator groups within Article 10(5) of Regulation (EU) 2013/390<sup>18</sup>. Member states are grouped to maximise the similarities within each group and minimise the similarities between groups. For RP3, Ireland was placed in Cluster Group 2 along with Denmark (NAVIAIR), Finland (ANS Finland), Norway (AVINOR) and Sweden (LFV). The clustering analysis was undertaken using data on traffic complexity, traffic volumes, cost of living indices, traffic variability and unit ATCO employment costs.

A summary of our most recent cost effectiveness performance in comparison with the other RP3 Comparator Group ANSPs is shown in Table 22 overleaf.

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<sup>18</sup> Commission Implementing Regulation (EU) No 390/2013 of 3 May 2013 laying down a performance scheme for air navigation services and network functions



**Table 22 Cost effectiveness performance summary**

Performance Area	KPI	Performance relative to RP3 Comparator Group
Financial cost effectiveness	ATM/CNS <sup>19</sup> cost per composite flight hour <sup>20</sup> (gate-to-gate) (€)	Best
Economic cost effectiveness (includes costs of delays)	ATM/CNS + ATFM delay cost per composite flight hour (gate-to-gate) (€)	Best
ATCO employment costs	ATCOs in ops employment cost per ATCO-hour in ops (€)	Third best
ATCO productivity	Composite flight hours handled per ATCO-hour in ops	Best
Support costs	Gate-to-gate support cost per composite flight hour (€)	Second best

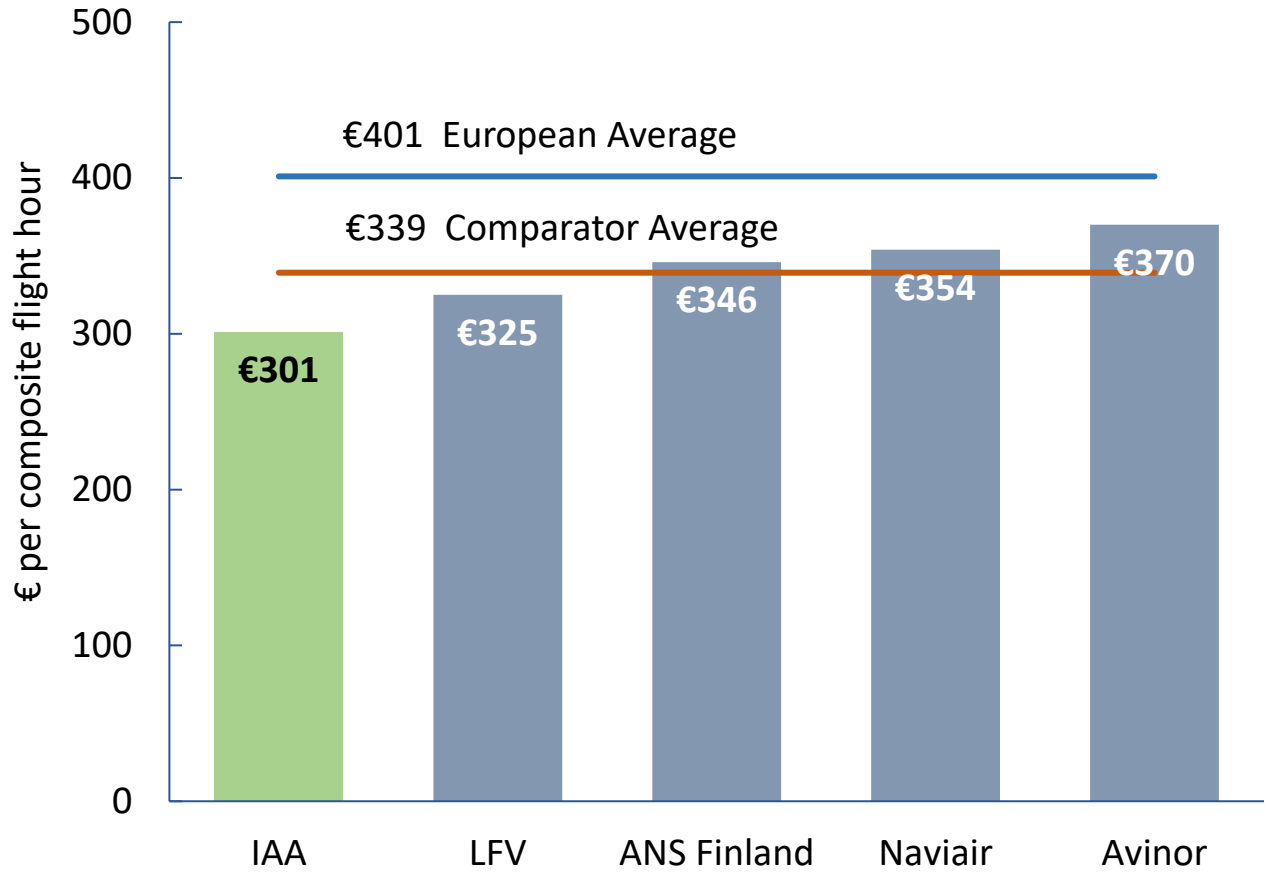
The financial cost-effectiveness performance indicator in the ACE Benchmarking Report is defined as the ATM/CNS provision cost per composite flight-hour. These costs are analysed on a gate-to-gate basis to avoid any distortion caused by differences in how ANSPs allocate their costs between En route and Terminal.

As shown in Figure 10, the IAA had the lowest gate-to-gate ATM/CNS provision cost per composite flight hour amongst the five ANSPs in the RP3 comparator group in 2017, this result being 25% below the European average.

<sup>19</sup> CNS: Communications, navigation and surveillance

<sup>20</sup> Composite flight hour: the number of flight-hours handled by each ATCO hour

**Figure 25 Gate-to-gate ATM/CNS provision cost per composite flight hour**

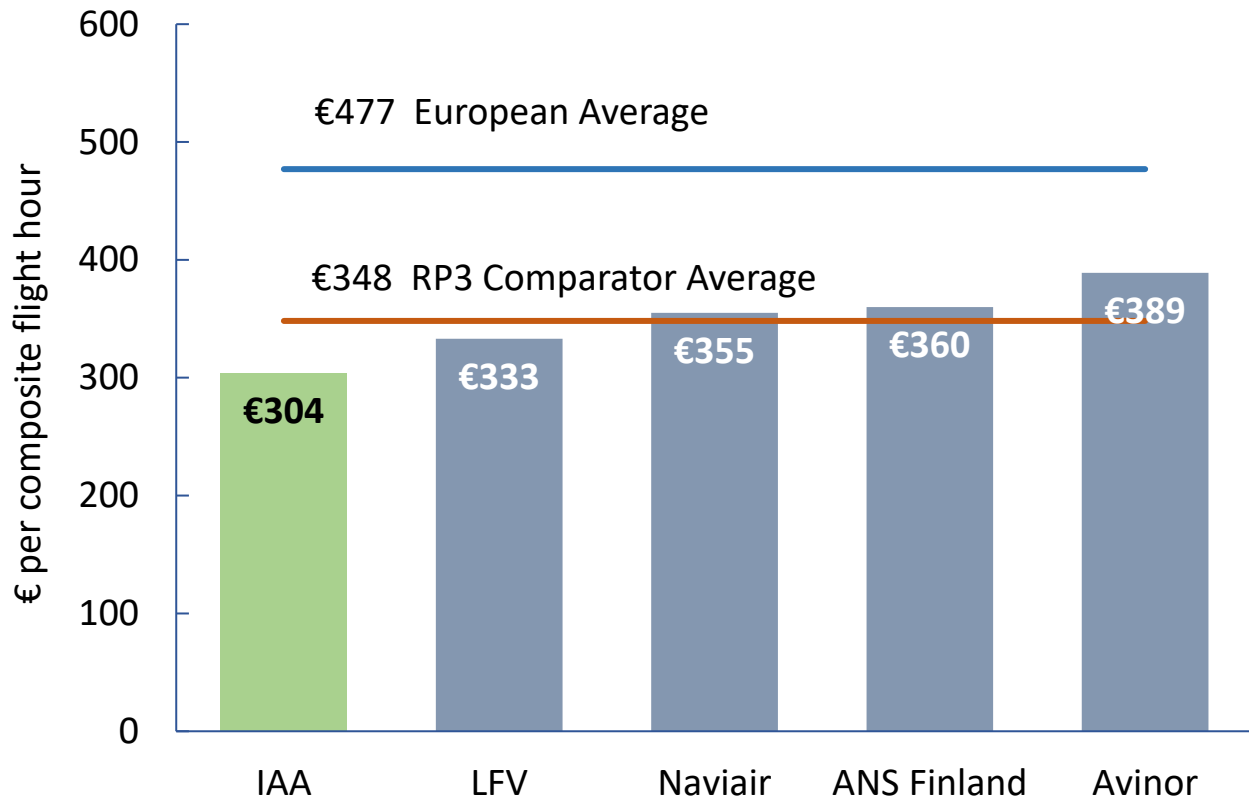


### Cost per composite flight hour

Economic cost-effectiveness is measured with the ANS provision cost per composite flight hour, which is defined as the ATM/CNS provision cost plus the cost of ATFM delays for both en-route and airport, all expressed per composite flight-hour. That is, comparing ANSPs' cost when delivering the same level of service quality.

As shown in Figure 26, in 2017 the IAA had the lowest gate-to-gate ANS provision cost per composite flight hour within the comparator group. As the IAA's contribution to ATFM delay is minimal, the difference with the European average widens from 25% when the ATFM delay is not considered, to 36% when it is.

**Figure 26 Gate-to-gate ANS provision cost per composite flight hour**

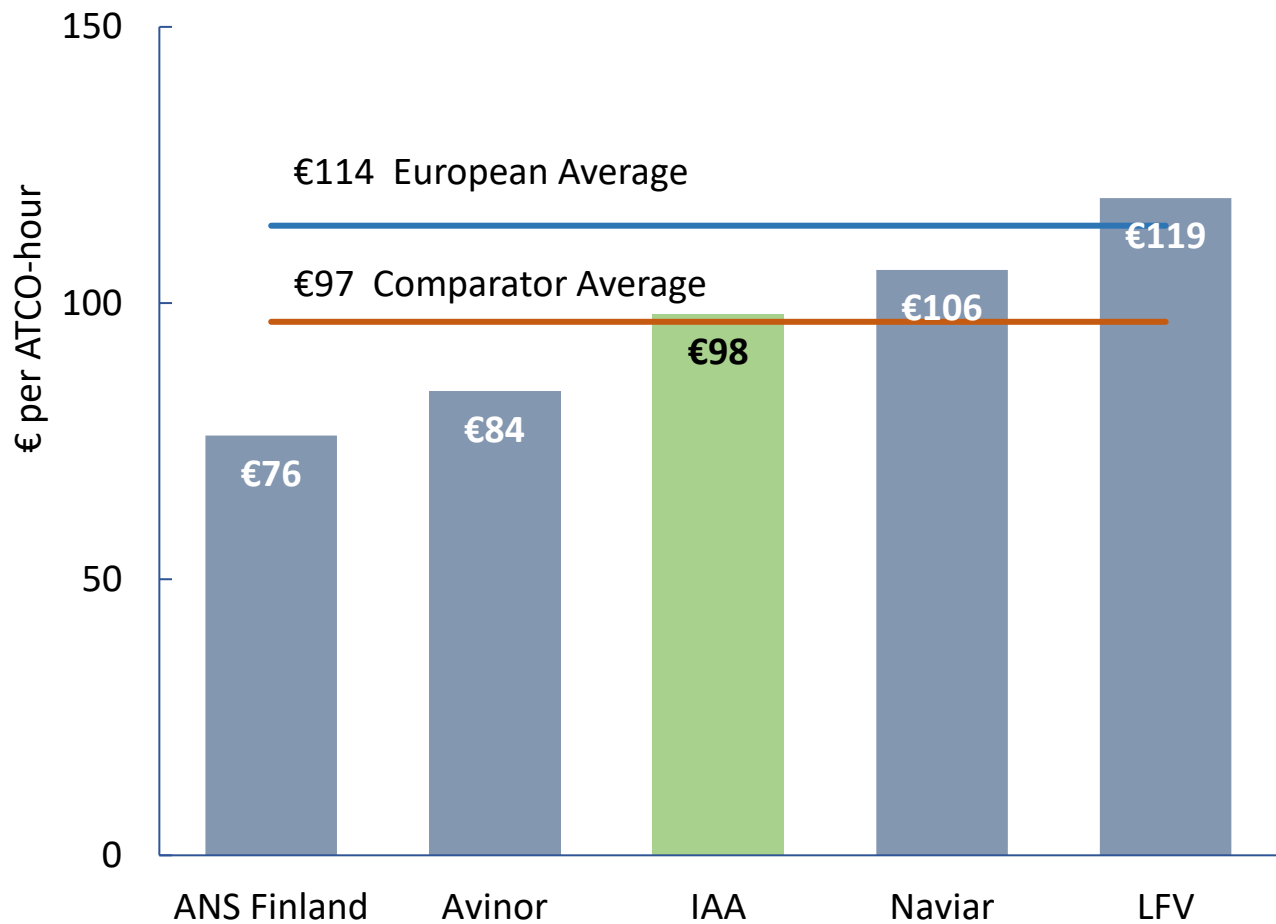


### Cost per ATCO hour

Figure 27 below shows ATCO (in operations) employment cost per ATCO-hour for IAA's RP3 comparator group. This metric represents the average employment cost per hour on duty.

In 2017 the IAA had the third lowest ATCO employment cost per ATCO-hour. Our unit cost for employment cost is 14% below European Average.

**Figure 27 ATCO employment cost per ATCO-hour**

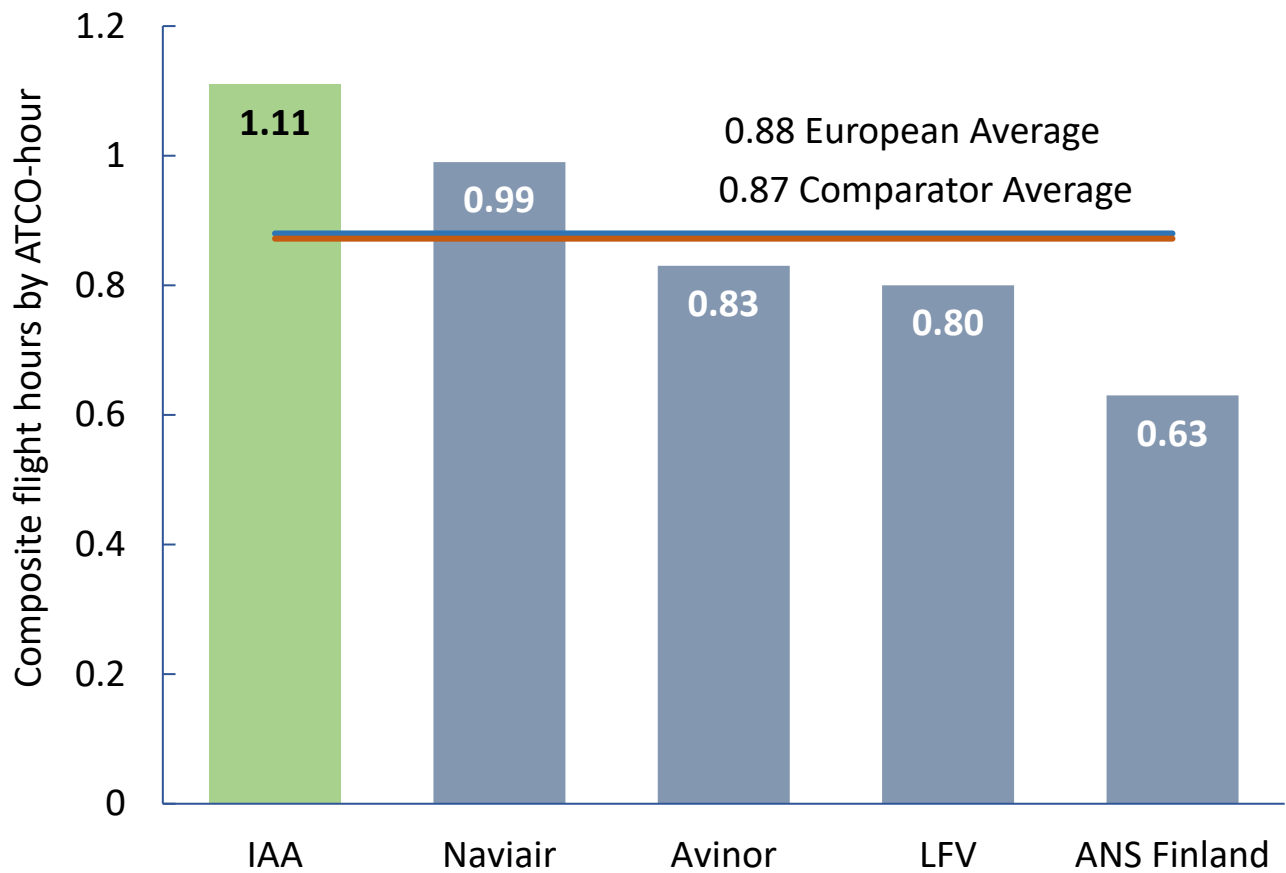


### Flight hours controlled per ATCO hour

ATCO-hour productivity is measured as the number of flight-hours controlled per ATCO-hour. This is a key consideration for any ANSP, as it is the only productivity KPI considered in the ACE report.

In terms of ATCO-hour productivity, the IAA is the best in the comparator group and 26% above the EU average.

**Figure 28 Composite flight hours handled by ATCO-hour in ops**

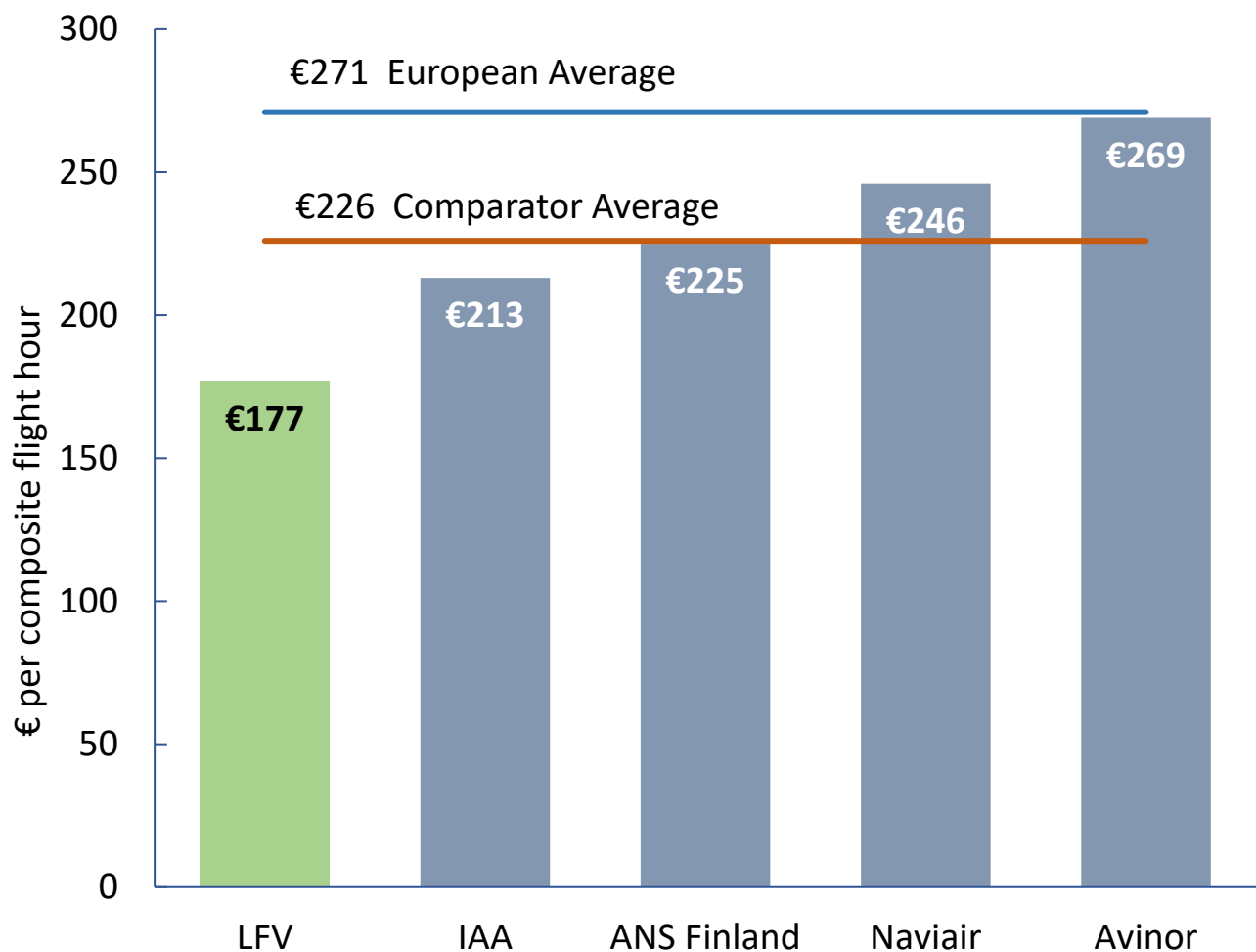


### Support Costs

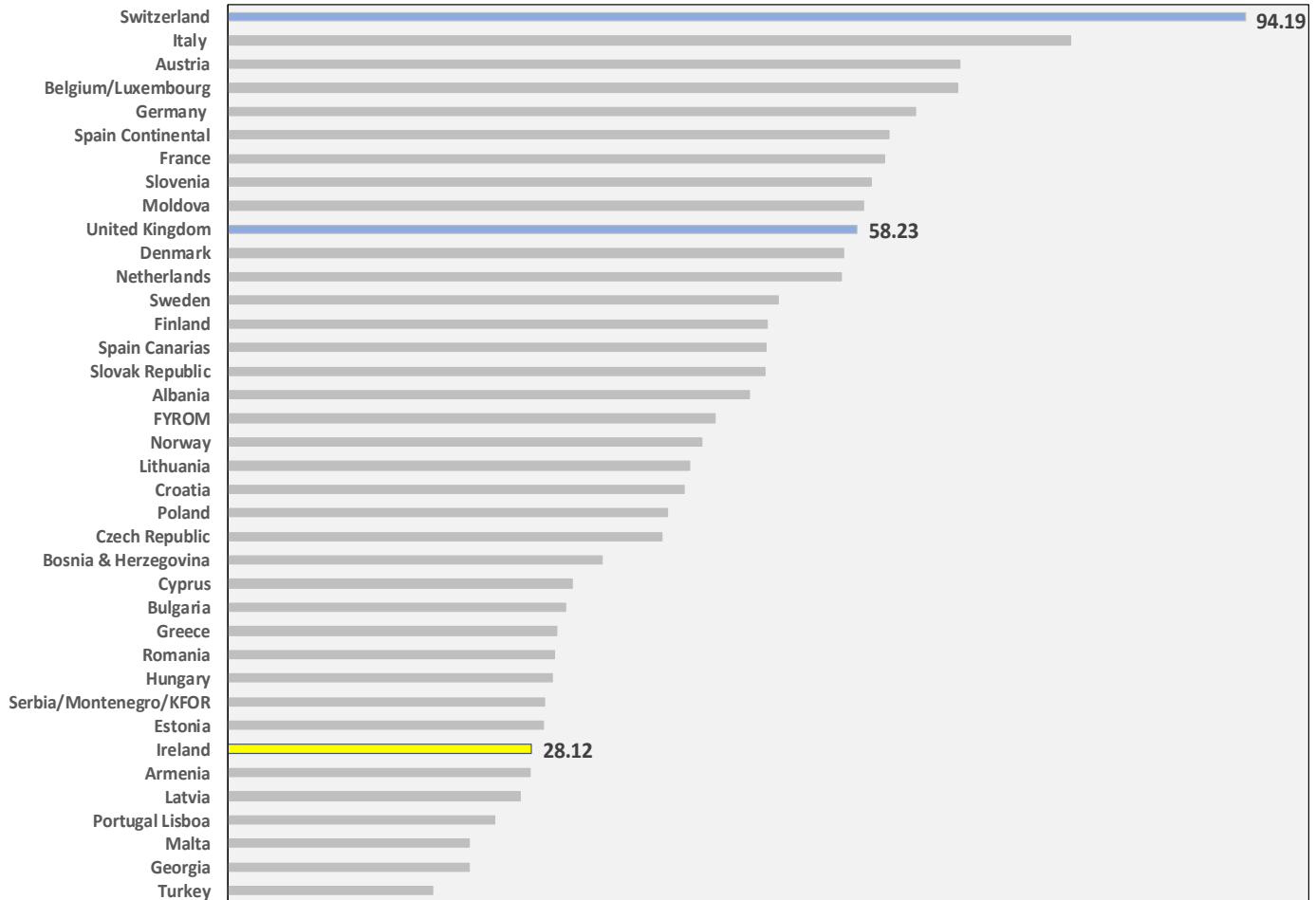
Support costs include employment costs for non-ATCO in ops staff, non-staff operating costs, capital-related costs and exceptional costs.

Figure 29 shows support costs per composite flight hour. Our support cost was the second lowest of the comparator group and 21% below European Average.

**Figure 29 Gate-to-gate support costs per composite flight hour**



**Figure 30 EUROCONTROL En Route unit rates €2019**



In the final year of RP2, Ireland’s en route charge remained one of the lowest in Europe at €28.12.

Ireland’s charge of €28.12 compares favourably to the UK (€58.23), France (€60.81), Germany (€63.63) and Italy (€77.96). The average of all 38 ANSPs is €44.88 and excluding Ireland is €45.33.

Only 6 of the 38 ANSPs had a lower charge including Turkey (€19.03), Georgia (€22.36), Malta (€22.37), Portugal Lisboa (€24.68), Latvia (€27.02) and Armenia (€27.99).

Figure 31 EUROCONTROL En Route unit rates €2018

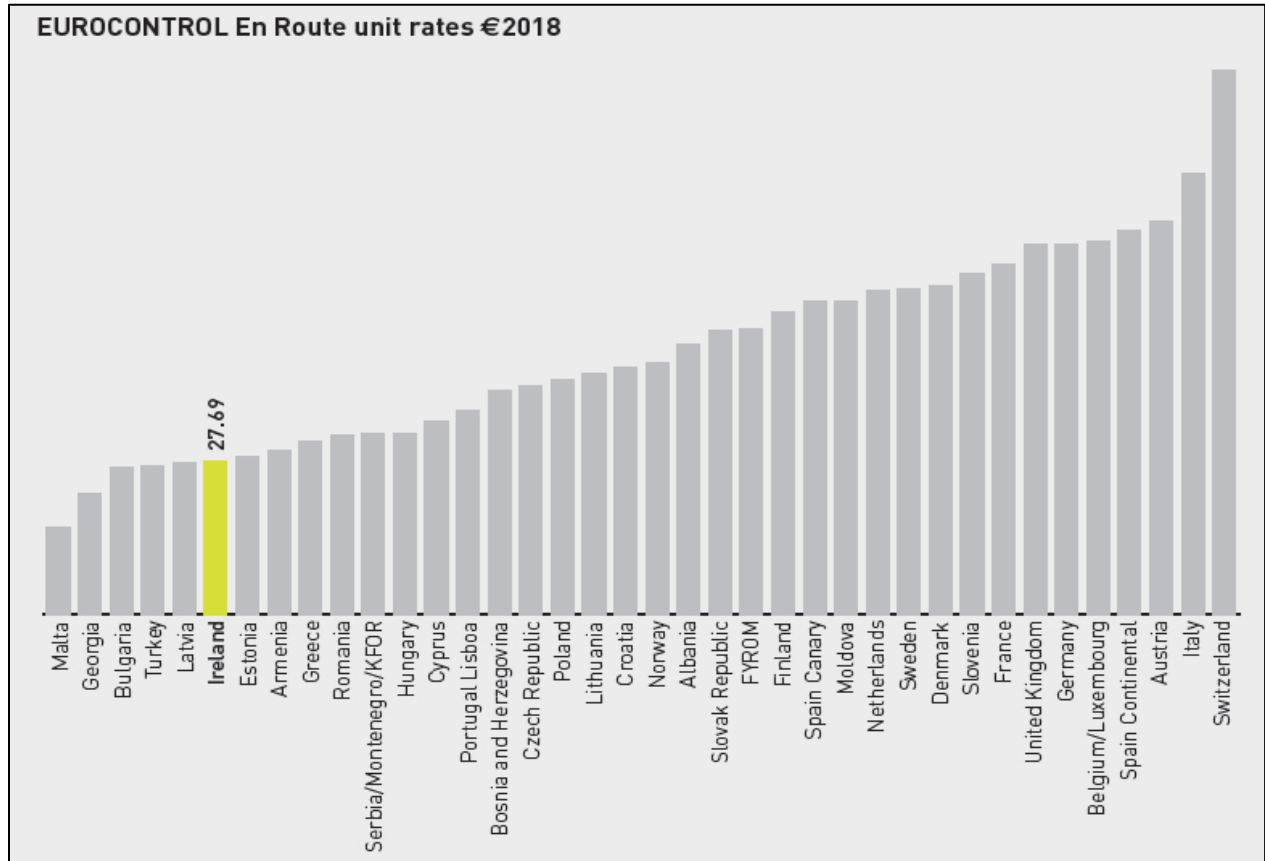


Figure 31 confirms that in 2018 Ireland also had one of the lowest en route unit rate charges in Europe at €27.69. Following an increase of €0.43 in 2019, Ireland went from being the 6<sup>th</sup> cheapest in Europe in 2018 to the 7<sup>th</sup> cheapest in Europe in 2019.

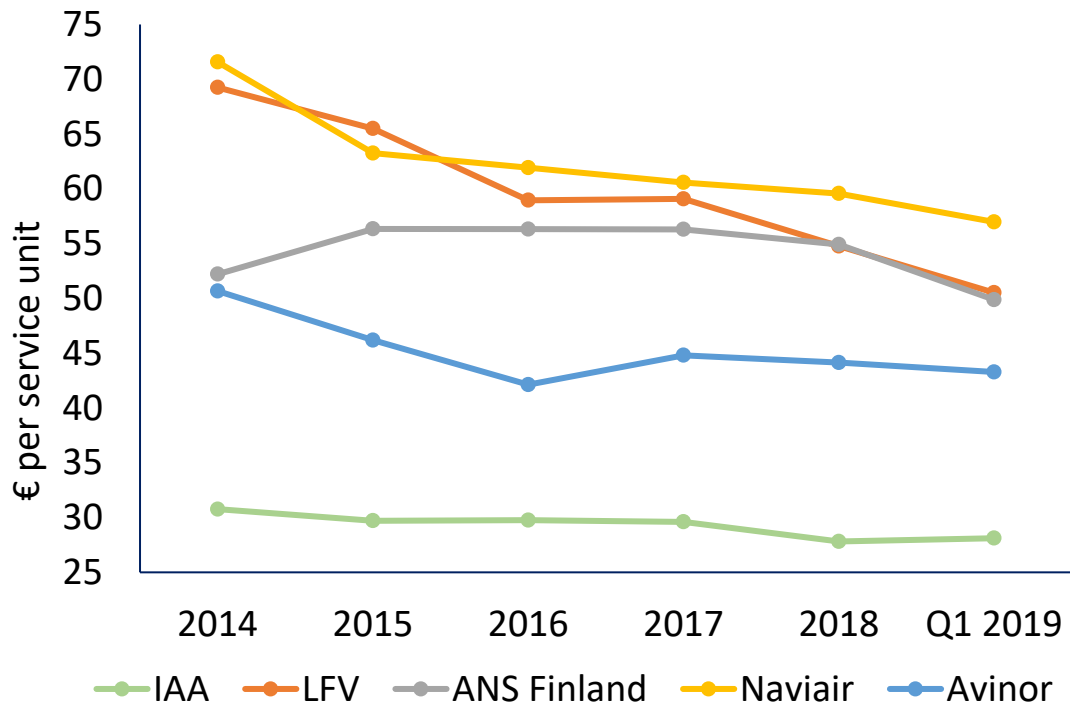
This plan will support IAA in providing excellent safety and service delivery to our customers, as well as provide an equitable contribution to the Union-wide targets and maintaining IAA’s position as one of the lowest cost, best value for money ATM service providers in Europe.



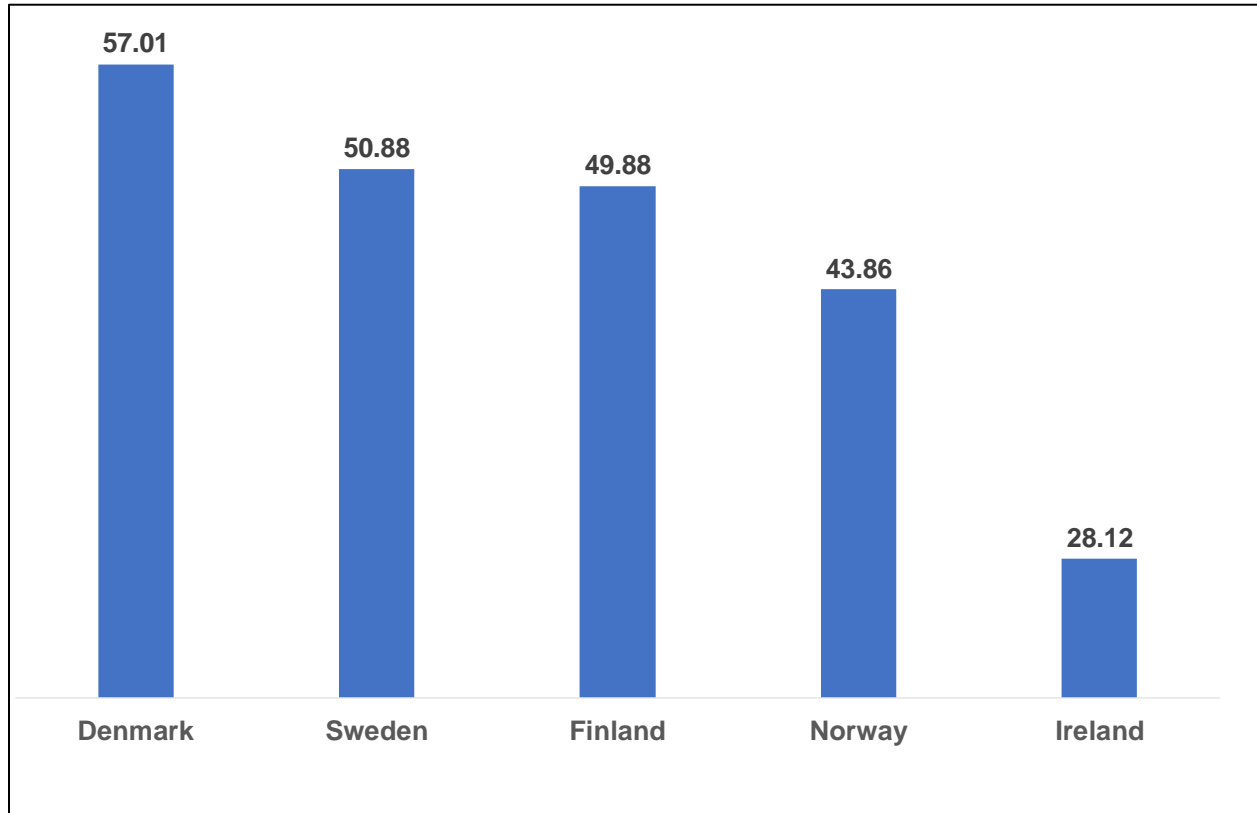
### En route Unit Rates

The IAA Unit Rate is consistently lower than the RP3 comparator group of ANSPs and is amongst the lowest in Europe. Figure 6 shows the unit rate of route charges in Euros.

**Figure 32 En route Unit Rate with RP3 Comparator Group**



**Figure 33 RP3 Comparator Group B – ENR in 2019**

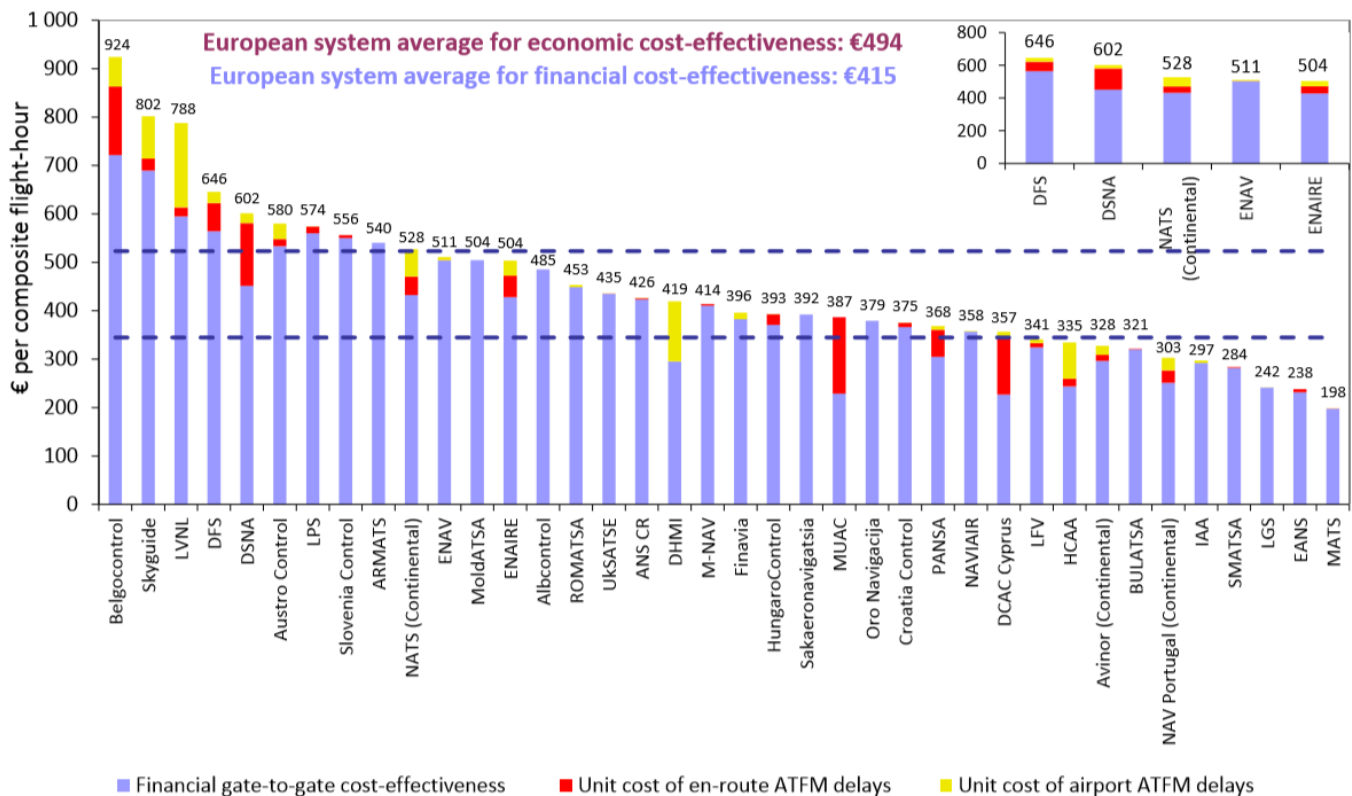


- Relevant comparator groups have been identified by the European Commission for ANSPs ahead of RP3, with Ireland in Comparator Group B alongside Denmark, Sweden, Finland and Norway. Paragraph 24 of the Draft RP3 Implementing Regulation states that “...*comparator groups of air navigation service providers with a similar operational and economic environment should be established for the purpose of assessing performance targets in the key performance area of cost-efficiency. To establish those groups, the complexity of the airspace, the levels and variability of traffic, the cost of living, and the unit air traffic controllers’ employment cost for each air navigation service provider were taken into account.*”
- Given that Ireland is considered by the EC as being most comparable to Denmark, Sweden, Finland and Norway from the perspective of cost amongst other variables, it is striking that Ireland’s rate (€28.12) in 2019 is half that of Denmark (€57.01) and considerable lower than Sweden, Finland and Norway.

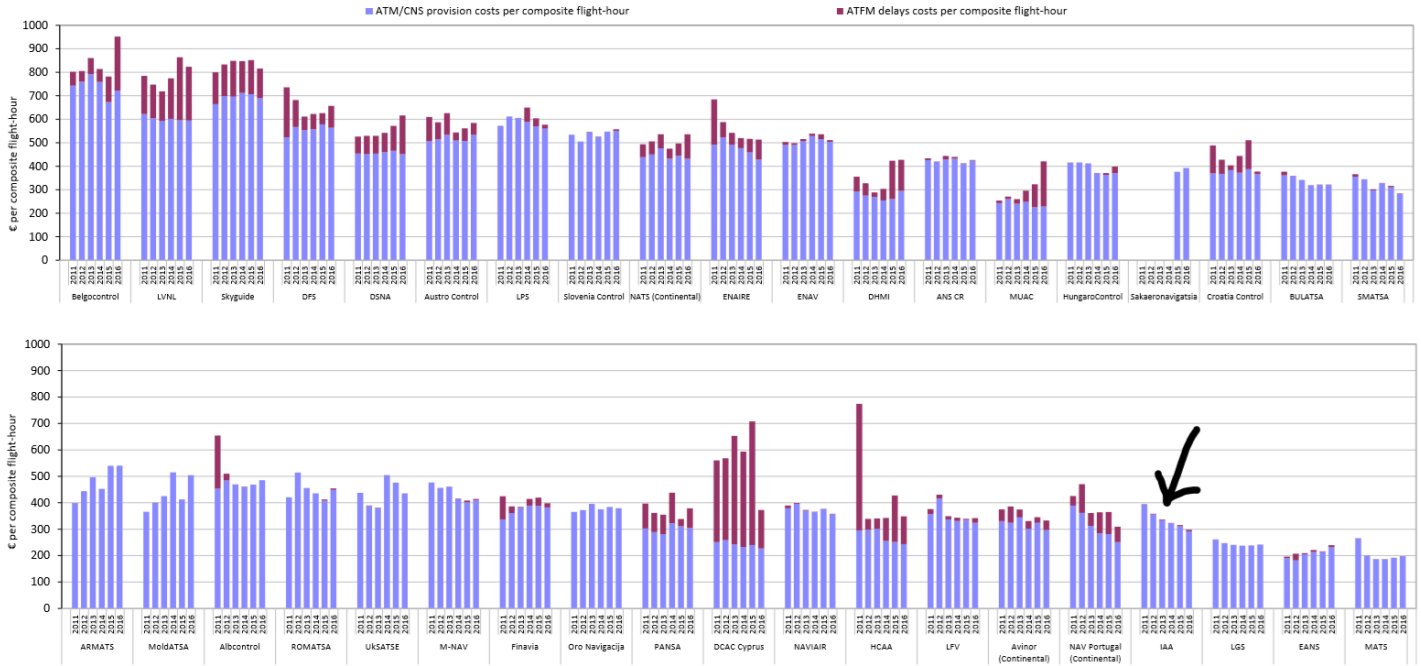
Given the level of efficiency achieved to date with respect to Ireland’s en route unit rate, it may be counterproductive to insist that the more efficient ANSPs should achieve the same cost reductions as those ANSPs at the other end of the spectrum. This approach implies that the more efficient ANSPs should deliver more in relative terms despite the apparent uniform nature of the Union-wide targets.

If the IAA ANSP is disallowed a necessary cost increase in RP3, this would constitute a major failing of European regulation. We have contributed (disproportionately) to the targets in RP1 and RP2 and by virtue of being subject to the proposed RP3 Union-wide target, which seeks to address inefficiencies elsewhere, we could find ourselves penalised more severely relative to those who are not as efficient. To ensure that capacity and service delivery is optimised, there needs to be appropriate recognition of national circumstances within the respective performance plans.

**Figure 34 Changes in Cost Effectiveness by ANSPs 2011-2016 (real terms)**



**Figure 35 Changes in Cost Effectiveness by ANSPs 2011-2016 (real terms)**



### ATCO Planning for Capacity

The recruitment of ATCOs is quite a lengthy process and takes over two years in Ireland. However, this duration compares very favourably to many other European jurisdictions and is mainly due to the intensive training programme developed by EPNI and the flexible deployment of staff whereby most IAA ATCOs are not sector specific. A recruitment campaign typically lasts several months to assess and evaluate candidates following which successful candidates enter a rigorous training process for approximately fourteen months. Once the initial training is successfully completed, ATCOs proceed to on-the-job training for four-five months before being fully operational. This significant lead time coupled with the uncertainty surrounding actual traffic over the medium term means that it is not possible to deploy new ATCOs in line with unexpected traffic developments. It is therefore prudent for planning purposes to ensure that sufficient ATCOs are trained in the event that the projected traffic scenarios materialise.

## Cross Border Initiatives

Owing to the UK set to leave the EU, there is some uncertainty surrounding the future of the UK-Ireland Functional Airspace Block (FAB), which explains why Ireland is submitting a national performance plan for RP3. Notwithstanding this, the IAA is undertaking a number of cross border initiatives that achieve efficiencies and are innovative. These include COOPANS, Entry Point North and Borealis.

- COOPANS is an international partnership that includes the IAA and ANSPs from five other countries (Austria, Croatia, Denmark, Portugal and Sweden). The ANSPs act as one organisation and the system supplier is Thales. There are benefits from sharing know-how in the form of common tools, methods and operational procedures throughout the system life cycle whereas financial benefits arise from common procurement for development, integration, deployment and maintenance.
- Entry Point North is one of the largest global ATS training academies that offers a wide portfolio of services to aspiring and operational air traffic controllers, air traffic service officers, air traffic safety electronics personnel, administrative personnel and other aviation related personnel. It has locations in Ireland, Sweden, Hungary, Denmark, Spain and Belgium.

In terms of efficiencies during RP3, the sharing of training costs and common overheads ultimately ensures that training is received at a cheaper cost.

- Borealis is an alliance of ANSPs from Ireland, Denmark, Estonia, Finland, Iceland, Latvia, Norway, Sweden and the UK. Borealis Alliance focuses on strategic business cooperation between the member ANSPs, seeking economies of scale and projects that can be achieved on a commercial basis, complementing the work of the northern European FABs, but without the need for regulatory or State involvement. The alliance is also an important enabler of joint initiatives to improve flight efficiency and reduce environmental impact, delivered across the whole area. This is of particular relevance for the implementation of cross border free route airspace in the Irish UK context.

The IAA has operated FRA since 2009. NATS are planning to introduce FRA on a phased basis over the first three years of RP3. The IAA will fully cooperate with the required procedural changes and system upgrades associated with this introduction. FRA within NATS airspace will complete the roll out of cross border FRA across the entire airspace of the Borealis nine-member states. Irish flight

efficiency values, which are currently extremely efficient, will improve further following this development. While it is not possible to accurately forecast what improvements in flight efficiency will be achieved by the full introduction of cross border FRA between the UK and Ireland, it is reasonable and prudent to expect that an annual saving of 1 million kms per annum could be achieved from 2023<sup>21</sup>.

## **Investment Planning**

The IAA only partakes in projects which are deemed necessary in order to deliver quality of service, adhere to regulatory and legislative requirements and/or ensure compliance with the SESAR ATM Master Plan. We do not conduct research and development, and wherever possible we procure commercially available, off the shelf products and services. Customisation is kept to the absolute minimum necessary to allow us to provide a safe, cost efficient and expeditious service to our airline customers.

### **The Air Traffic Control Tower at Dublin Airport**

During RP2, the IAA was required to commence the construction of a new air traffic control tower at Dublin Airport. This project had not been envisaged when RP2 plans were being developed because the subsequent surge in traffic had not been anticipated and caught all stakeholders including the airport, airlines and other regulators by surprise. This growth in traffic triggered the development of a new runway at the airport in the first year of RP2.

The significance of the IAA's second tower at Dublin Airport is that it will be completed and operational in time for the opening of the north runway in Dublin Airport, expected to be late 2021. Ensuring full visibility of the parallel runways at Dublin Airport, this major capital investment will be a landmark building when completed and will be amongst the most modern air traffic management facilities in Europe.

### **Relevance of this plan for RP4**

The ATC tower at Dublin Airport is a good example of a critical project that spans two reference periods. It is important to recognise that this principle of overlapping reference periods will continue to apply and is relevant for RP3. The benefits of some of the projects will, for example, not be full recognised in RP3 and may even span more than two reference periods.

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<sup>21</sup> Draft Performance Review Report 2018 <https://www.eurocontrol.int/publications/performance-review-report-prr-2018-consultation>

## **Interdependencies and Trade-Offs**

The KPAs covered by this business plan should not be considered as stand-alone. It should be recognised that performance in one area will affect performance in other areas.

The links between the KPAs and the resulting trade-offs in terms of performance is a critical aspect of this Plan. Changes in one KPA target area (e.g. cost efficiency) can adversely affect the achievement of KPA targets in another (e.g. capacity / delays).

## **Safety and the other KPAs**

The level of ANS safety required under EU legislation will not be subject to such trade-offs under any circumstances. Where interdependencies arise between safety and the other three KPAs (cost-efficiency, capacity and the environment), these will be effectively managed so as not to compromise the required level of safety. In advance of implementation, all new and/or improved processes, procedures and technology will be subject to the rigorous application of the IAA's Safety Management System (SMS) and will benefit from the oversight of the Safety Regulation Division. This approach has served the IAA and our customers well to date and will continue to do so in the future. However, safety has a cost and more stringent regulations coming on stream in RP3 such as Fatigue Risk Management (FRM) has to be accounted for.

## **Capacity and Cost-Efficiency**

En route Air Traffic Flow Management delays in Irish en route airspace continue to be extremely low during RP2 despite traffic growth which has been far in excess of the levels forecasted in our RP2 plan. The IAA is relying on guidance from STATFOR projections with en route traffic growth of 1.8% on average per annum expected during RP3. Resources are a key element in the achievement of the targets set in all areas, particularly capacity. As noted in Table 10, traffic increases, and other legal and regulatory demands have resulted in overtime [+58%] and annual leave carry over [+44%] increasing to unsustainable levels during RP2.

There is a high level of interdependency between capacity and cost-efficiency. Achieving our RP3 capacity target will result in additional costs in terms of increased staffing. The upward trend in overtime levels and annual leave carry over experienced over RP2 must be reversed. Failure to do so could potentially impact our ability to deliver the agreed RP3 capacity target due to staffing issues as well as the implementation and development of projects designed to enhance our service to customers.

Further investment in staffing and technology is required to sustain the required performance. The link between overtime, annual leave accumulation and fatigue needs to be emphasised. This will become particularly relevant with the implementation of Regulation (EU) 2017/373. The airline industry has previously encountered difficulties with rostering resulting in large scale flight cancellations and this needs to be avoided in Air Traffic Service provision.

### **Capacity and Environment (flight efficiency)**

Our en route airspace is Free Route (FRA) and as a result our en route flight efficiency values are extremely efficient. Further improvements in en route flight efficiency are largely dependent on the introduction of FRA in our neighbouring ANSPs and with the accompanying system upgrades to enable full cross border FRA.

NATS are planning to introduce FRA on a phased basis over the first three years of RP3 and the IAA will fully cooperate with this introduction.



## 10 RP3 Financials

The IAA's RP3 Business Plan has been prepared based on the following assumptions. It should be noted that the numbers presented include some minor differences due to rounding.

### 10.1 Inflation

In line with Implementing Regulation 2019/317, this Plan assumes an inflation forecast based on the International Monetary Fund (IMF) Consumer Price Index (CPI).

**Table 23 Inflation assumptions based on IMF**

2020	2021	2022	2023	2024
1.5%	1.7%	1.9%	2.0%	2.0%

### 10.2 Traffic forecast

En route and terminal traffic forecasts, expressed in total chargeable service units, are based on EUROCONTROL's STATFOR base forecast from February 2019 updated for the M3 adjustment as advised by EUROCONTROL on 28 May 2019.

**Table 24 Inflation assumptions based on IMF**

En Route	2020	2021	2022	2023	2024
STATFOR Base Feb 2019	4,806,000	4,826,000	4,926,000	5,009,000	5,092,000
M3 adjustment	-0.74%	-0.74%	-0.74%	-0.74%	-0.74%
Adjusted STATFOR Base	4,770,436	4,790,288	4,889,548	4,971,933	5,054,319

Terminal	2020	2021	2022	2023	2024
STATFOR Base Feb 2019	189,600	195,600	198,800	202,900	206,700

### 10.3 Starting point

The IAA's 2019 approved operating and capital budget is the starting point for this plan.

### 10.4 Determined Costs

Determined costs for the IAA in RP3 are comprised of staff costs, other operating costs, depreciation and cost of capital. In total, determined costs for RP3 (*2017 prices*) amount to €619.0 million for en route and €183.4 million for terminal. Included in these totals are €24.6 million for en route and €5.8 million for terminal relating to the costs to be incurred by the ANSP from the proposed restructuring of the IAA. The breakdown of these costs is set out in part 10 of this section.

**Table 25 En Route Determined Cost**

<i>2017 prices</i>	<b>2020 €'000</b>	<b>2021 €'000</b>	<b>2022 €'000</b>	<b>2023 €'000</b>	<b>2024 €'000</b>	<b>RP3 Total</b>
Staff costs	63,337	66,100	68,163	69,924	71,818	<b>339,342</b>
Other operating	36,645	37,578	37,955	37,736	38,138	<b>188,052</b>
Depreciation	11,154	12,150	13,070	13,804	14,495	<b>64,673</b>
Cost of Capital	5,057	5,356	5,482	5,431	5,627	<b>26,953</b>
<b>Total</b>	<b>116,193</b>	<b>121,184</b>	<b>124,670</b>	<b>126,895</b>	<b>130,078</b>	<b>619,020</b>

**Table 26 Terminal Determined Cost**

<i>2017 prices</i>	<b>2020 €'000</b>	<b>2021 €'000</b>	<b>2022 €'000</b>	<b>2023 €'000</b>	<b>2024 €'000</b>	<b>RP3 Total</b>
Staff	12,708	13,290	13,723	14,080	14,382	68,183
Other operating	8,966	8,588	8,050	8,162	8,099	41,865
Depreciation	5,976	8,023	9,333	9,669	10,181	43,182
Cost of Capital	4,307	6,169	6,834	6,547	6,284	30,141
<b>Total</b>	<b>31,957</b>	<b>36,070</b>	<b>37,940</b>	<b>38,458</b>	<b>38,946</b>	<b>183,371</b>

## 10.5 Staff costs

Staff costs, including pension costs, are driven mainly by forecasts of headcount and pay. Total headcount is forecast to increase by 13.4% over the course of RP3 from a base in 2019 of 554 employees to 628 employees at the end of 2024.

**Table 27 ANSP headcount requirements for RP3**

	2019	2020	2021	2022	2023	2024
ATCOs	313	325	333	338	338	346
Engineers	72	91	92	93	94	94
Data Assistants	37	43	45	45	45	45
Ops Mgt / Support	65	71	71	71	71	71
Corporate Services	67	71	72	72	72	72
<b>Total</b>	<b>554</b>	<b>601</b>	<b>613</b>	<b>619</b>	<b>620</b>	<b>628</b>

**Table 28 ATCO requirements for RP3**

	2019	2020	2021	2022	2023	2024
ATCOs	313	325	333	338	338	346

From 2019, ATCO headcount will increase over the course of RP3 to meet the operational requirement to support increasing traffic, provide operational resilience and meet the demand for a new parallel runway at Dublin airport. The new runway brings with it a significant change to the IAA's staffing requirement, not only in terms of increased ATCOs but also increased numbers of engineers, data assistants and operational support staff. An additional 18 ATCOs will be required to service the new runway.

New Regulations such as Regulation EU 373/2017 will require additional resources while the ANSP's capacity to deliver on safety work, ATM occurrence investigations, systems testing and validations, project work, on-the-job training and competency assessments will require the planned increases in headcount.

This plan assumes 4 new Student Controller Programmes with students expected to complete their training in 2020, 2021, 2022, and 2024. Some of these trainees will be recruited to offset future retirements. The Plan assumes that ATCOs will retire, on average, at age 63, consistent with previous years.

The planned increase in ATCOs from 313 in 2019 to 325 in 2020 is explained by the Student Controller Programme intake which commenced their training in June 2019.

The IAA’s air traffic controllers are, in the main, multi-rated, holding a minimum of two ratings each. This ensures that the ANSP can continue to operate in a flexible manner in delivering a high-quality service to its airline customers.

**Table 29 Engineer / Technical services requirements for RP3**

	2019	2020	2021	2022	2023	2024
Engineers	72	91	92	93	94	94

An increase in Engineers from 72 to 94 over the RP3 period is required to support current operational systems and deliver future systems into operation. In particular, increased engineering resources are required to support the new control tower at Dublin airport in terms of power supply, telecoms, air conditioning, CNS and ATM systems. The current tower will be maintained as a contingency tower requiring ongoing monitoring and maintenance. The new parallel runway will have new instrument landing systems and new ground radar systems which will also require engineering resources to monitor and maintain.

This Plan assumes that total capital expenditure in RP3 (cashflow basis) will amount to €140.5 million. This compares to a capital spend (cashflow basis) of approximately €71.5 million in RP2, excluding the construction cost of the new tower. The IAA is committed to delivering its planned CAPEX programme and the forecasted engineering headcount for RP3 will ensure that this programme is delivered.

The additional engineering headcount also makes provision for the planned implementation of various regulations including EU Regulation 373/2017 and the NIS directive. Implementation will require new engineering skills, increased competency and training and an enhanced security capability.

Our new en route contingency centre, located at Ballygirreen, will be operational from 2020. This is a significant operational facility requiring additional engineering resources for monitoring and maintenance of power supplies, telecoms, air conditioning, CNS and ATM systems. This centre will improve our systems and operations resilience.

Finally, a higher engineering headcount is justified from the viewpoint of ongoing maintenance of operational systems. Older CNS systems had longer lifecycles whereas

the modern systems are server-based requiring more software patching and updates. With regulatory demands in terms of QMS, SMS, SeMS etc for quality, safety and security, there is a requirement for additional headcount.

**Table 30 Data Assistant requirements for RP3**

	2019	2020	2021	2022	2023	2024
Data Assistants	37	43	45	45	45	45

An increase in Data Assistants (DAs) from 37 to 45 during the RP3 period is required to support the increasing ATCO headcount and meet the demands for the new parallel runway at Dublin airport. Additional resources are also required to support the planned evolution of the Aeronautical Information Service (AIS) from a paper-centric service to a data-centric service. This will result in an increase in the range and scope of aeronautical information provided. The roll-out of the Aeronautical Surface Screening Evaluation Tool (ASSET) and charting requirements will also drive the requirement for additional DA resources.

**Table 31 Operational Management and Support requirements for RP3**

	2019	2020	2021	2022	2023	2024
Ops Mgt / Support	65	71	71	71	71	71

Operations support staff support the ANSP through management of its operations, safety management and improvement, airspace design and ATCO training. An increase of 6 headcount in this area is required over the RP3 period as follows:

Staffing	Numbers Required	Rationale
Compliance manager	1	EU Regulation 373/2017 requires that the ANSP establish a compliance monitoring function to monitor compliance with regulatory requirements
Grants support	1	The IAA is committed to continuing its efforts to secure EU funding for its capital projects. This funding will be returned to the airspace users in the form of lower customer charges
Technical safety manager	1	Technical services are subject to an increasing number and scope of changes to the functional system which are in turn subject to safety risk assessment and the production and review of safety cases. The increase in workload in this area and the specialised technical nature of the content

		necessitates its own safety management system and structure with a full time Technical Safety Manager.
Safety Professionals	2	Additional headcount is required to address the ongoing regulatory and process changes to SMS/SRM core activities and the roll-out of very significant operational and technical projects. Essential changes are required at unit SMS level to strengthen unit safety manager function with dedicated full time SMS safety professionals.
Operations support	1	Increases in specialised administrative workload associated with regulatory changes, reporting requirements, performance management, meeting attendance and other duties necessitates an additional Operations Aviation Officer.

**Table 32 Corporate Services requirements for RP3**

	2019	2020	2021	2022	2023	2024
Corporate Services	67	71	72	72	72	72

Corporate Services staff cover human resources, procurement, ICT, finance, legal, property, security, communications etc. An increase of 5 headcount is required over the course of RP3 as follows:

Staffing	Numbers Required	Rationale
Integrated Mgt System coordinator	1	This headcount is required to rollout and implement the IAA’s own integrated management system, ensuring compliance, coordination, monitoring, training and reporting.
Security Mgt System coordinator	1	The IAA falls under the Irish State’s National Civil Aviation Security regulations requiring it to operate a compliant security management system. A clear requirement for a security management risk and programme coordinator role has been identified.
Finance	1	Increased statutory reporting obligations, implementation of planned new technologies and upgrades to existing systems as well as more onerous audit requirements has highlighted the need for additional finance personnel.
Human resources	2	Additional headcount is required to support a significant recruitment drive in RP3, support the

		rollout of digital rostering and HR systems upgrades, meet increasingly onerous statutory obligations including GDPR and further develop the IAA's employee wellbeing programme.
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## 10.6 Pension costs

The IAA has two pension schemes. For employees who joined the IAA prior to 1 April 2008 and for employees who joined between 1 April 2008 and 31 December 2011, the IAA operates a defined benefit contribution scheme. This scheme is subject to an actuarial valuation every three years. The latest valuation was on 1 January 2018. The scheme is also subject to the Irish Pensions Authority's minimum funding standard (MFS). The pension scheme's actuary has calculated that the required level of contributions required to meet both the ongoing valuation and the MFS is in the order of 36.5% of pensionable pay. This Plan assumes that the employees of the ANSP will continue to make a pension contribution of 6% per annum thereby resulting in a pension contribution of 30.5% per annum by the ANSP.

**Table 33 Staff Pension Costs**

<i>2017 prices</i>	<b>2020 €'000</b>	<b>2021 €'000</b>	<b>2022 €'000</b>	<b>2023 €'000</b>	<b>2024 €'000</b>	<b>RP3 €'000</b>
En route	10,155	10,424	10,626	10,817	10,976	52,998
Terminal	2,008	2,071	2,109	2,146	2,159	10,493
<b>Total</b>	<b>12,163</b>	<b>12,495</b>	<b>12,735</b>	<b>12,963</b>	<b>13,135</b>	<b>63,491</b>

For employees who joined the company from 1 January 2012 to date, the IAA operates a hybrid pension scheme ie a defined benefit scheme up to a cap and a defined contribution scheme thereafter. The latest actuarial valuation of the defined benefit portion of the hybrid pension scheme calculated an employers' contribution rate of 7.2% per annum. This Plan makes provision for an annual contribution rate over the course of RP3 of 7.2% per annum.

For employees who exceed the hybrid defined benefit cap there is a defined contribution scheme. The IAA matches any employee contributions up to a maximum of 7%.

## 10.7 Other Operating Costs

Other operating costs comprise training, systems and equipment maintenance, spares, telecommunications and administration costs including rent and rates, insurance, security, building repairs and maintenance, cleaning etc. These costs can be broken down between en route and terminal as follows:

**Table 34 Other Operating Costs (En Route and Terminal)**

<i>2017 prices</i>	<b>2019</b> €'000	<b>2020</b> €'000	<b>2021</b> €'000	<b>2022</b> €'000	<b>2023</b> €'000	<b>2024</b> €'000	<b>RP3</b> €'000
En Route	█	█	█	█	█	█	█
Terminal	█	█	█	█	█	█	█
<b>Total</b>	<b>32,791</b>	<b>45,611</b>	<b>46,166</b>	<b>46,005</b>	<b>45,898</b>	<b>46,237</b>	<b>229,917</b>

Included in these totals are €11.9 million for en route and €2.5 million for terminal relating to the costs to be incurred by the ANSP from the proposed restructuring of the IAA. The breakdown of these costs is set out in part 10 of this section.

**Table 35 Breakdown of Operating Costs**

<i>En Route/Terminal</i> <i>2017 prices</i>	<b>2019</b> €'000	<b>2020</b> €'000	<b>2021</b> €'000	<b>2022</b> €'000	<b>2023</b> €'000	<b>2024</b> €'000	<b>RP3</b> €'000
Travel	█	█	█	█	█	█	█
Training	█	█	█	█	█	█	█
Utilities	█	█	█	█	█	█	█
Telecoms	█	█	█	█	█	█	█
Other Operational	█	█	█	█	█	█	█
Subscriptions	█	█	█	█	█	█	█
Administration	█	█	█	█	█	█	█
<b>Total</b>	<b>32,791</b>	<b>45,611</b>	<b>46,166</b>	<b>46,005</b>	<b>45,898</b>	<b>46,237</b>	<b>229,917</b>



**Table 36 Travel costs (En Route & Terminal)**

<i>2017 prices</i>	<b>2019 €'000</b>	<b>2020 €'000</b>	<b>2021 €'000</b>	<b>2022 €'000</b>	<b>2023 €'000</b>	<b>2024 €'000</b>	<b>RP3 €'000</b>
En route	■	■	■	■	■	■	■
Terminal	■	■	■	■	■	■	■
<b>Total</b>	■	■	■	■	■	■	■

Travel costs are expected to remain consistent over the course of RP3. All travel and subsistence costs are paid at rates approved by the Department of Finance. This Plan makes provision for costs of travel associated with domestic travel by IAA employees to IAA offices and facilities and for costs of international travel.

**Table 37 Training costs (En Route & Terminal)**

<i>2017 prices</i>	<b>2019 €'000</b>	<b>2020 €'000</b>	<b>2021 €'000</b>	<b>2022 €'000</b>	<b>2023 €'000</b>	<b>2024 €'000</b>	<b>RP3 €'000</b>
En route	■	■	■	■	■	■	■
Terminal	■	■	■	■	■	■	■
<b>Total</b>	■	■	■	■	■	■	■

This Plan makes provision for training costs in relation to ATCO training – ab initio, unit training including transitional, pre OJTI (on-the-job training instruction) simulator training and full OJTI training, continuation/refresher training and development training – technical engineering training and general training covering computer skills training, health and safety, management, security and succession training. ATCO training accounts for, on average, 82% of the total training cost.

**Table 38 ATCO Training costs**

<i>2017 prices</i>	<b>2019 €'000</b>	<b>2020 €'000</b>	<b>2021 €'000</b>	<b>2022 €'000</b>	<b>2023 €'000</b>	<b>2024 €'000</b>	<b>RP3 €'000</b>
ATCO training	■	■	■	■	■	■	■

ATCO training costs are expected to remain high in RP3 due to the training associated with the new tower and the overall increase in ATCO headcount resulting in higher costs of continuation training. As noted previously, this Plan makes provision for four student controller programmes as follows:

SCP class	Start Date	Graduation	Number of students
SCP17	June 2019	July 2020	13
SCP18	Jan 2020	Feb 2021	13
SCP19	Dec 2020	Jan 2022	9
SCP20	Dec 2022	Jan 2024	8

**Table 39 Engineer Training costs**

<i>2017 prices</i>	2019 €'000	2020 €'000	2021 €'000	2022 €'000	2023 €'000	2024 €'000	RP3 €'000
Engineering training	■	■	■	■	■	■	■

The cost of training for engineers is expected to increase in RP3 due to several factors as follows:

- Increased engineering headcount of circa 6% per annum over RP3
- EU Regulation 373/2017
- Network and Information Security directive and the IAA's new Security Management System (SMS)
- The significant increase in capital expenditure e.g. new tower, new runway and associated CNS and ATM systems

**Table 40 Other Training costs**

<i>2017 prices</i>	2019 €'000	2020 €'000	2021 €'000	2022 €'000	2023 €'000	2024 €'000	RP3 €'000
Other training	■	■	■	■	■	■	■

**Table 41 Utilities (En Route and Terminal)**

<i>2017 prices</i>	<b>2019</b> €'000	<b>2020</b> €'000	<b>2021</b> €'000	<b>2022</b> €'000	<b>2023</b> €'000	<b>2024</b> €'000	<b>RP3</b> €'000
En route	■	■	■	■	■	■	■
Terminal	■	■	■	■	■	■	■
<b>Total</b>	■	■	■	■	■	■	■

Utilities comprise costs of telephones and light and heat and are not expected to change materially over the course of RP3. Utilities account for, on average, just 0.4% of total expenditure.

**Table 42 Telecoms (En Route and Terminal)**

<i>2017 prices</i>	<b>2019</b> €'000	<b>2020</b> €'000	<b>2021</b> €'000	<b>2022</b> €'000	<b>2023</b> €'000	<b>2024</b> €'000	<b>RP3</b> €'000
En route	■	■	■	■	■	■	■
Terminal	■	■	■	■	■	■	■
<b>Total</b>	■	■	■	■	■	■	■

Telecoms comprise the costs of private wires for the transmission of radar data, flight plans, meteorological information and voice communications. The costs of these lines are planned to increase in RP3 due to the new tower at Dublin airport and the new en route contingency centre, which requires a parallel network. Along with this, there is an increased cost associated with the transition from TDM to IP Technology. TDM private wires are required for the stability they provide, and the newer IP services need to be monitored over time before they can be used to replace legacy TDM. Few, if any, European ANSP's are using IP networks for air-ground voice in a live operation environment. The IAA will operate with both for a period of time until IP network technology is fully proven for mission critical services. These costs are continually kept under review and, where possible, legacy lines are discontinued.

**Table 43 Other Operational Costs (En Route and Terminal)**

<i>2017 prices</i>	<b>2019</b> €'000	<b>2020</b> €'000	<b>2021</b> €'000	<b>2022</b> €'000	<b>2023</b> €'000	<b>2024</b> €'000	<b>RP3</b> €'000
En route	█	█	█	█	█	█	█
Terminal	█	█	█	█	█	█	█
<b>Total</b>	█	█	█	█	█	█	█

Other operational costs include the costs of maintenance, spares, power, environmental costs, flight checking and other. This Plan makes provision for these costs in RP3 as follows:

**Table 44 Breakdown of Other Operational Costs**

<i>En Route/Terminal</i> <i>2017 prices</i>	<b>2019</b> €'000	<b>2020</b> €'000	<b>2021</b> €'000	<b>2022</b> €'000	<b>2023</b> €'000	<b>2024</b> €'000	<b>RP3</b> €'000
Maintenance	█	█	█	█	█	█	█
Spares	█	█	█	█	█	█	█
Power	█	█	█	█	█	█	█
Environmental	█	█	█	█	█	█	█
Flight Checking	█	█	█	█	█	█	█
Other	█	█	█	█	█	█	█
<b>Total</b>	█	█	█	█	█	█	█

### **Maintenance**

Maintenance comprises contracts in relation to air traffic management operational systems and electrical plant as well as facilities management contracts. The largest increase in maintenance costs is seen in 2020 and this is driven by increases associated with the new tower and with the en route contingency centre – ATM systems hardware and software, voice switches and recorders, communications equipment and facilities management.

### **Spares**

The increase in the cost of spares reflects the increased capital spend with some large projects coming into operation in 2020 e.g. the new contingency centre and new tower.

### **Environmental**

Following the Irish Government's May 2019 announcement of a Climate and Biodiversity emergency, semi-states and public sector bodies will be required to take the lead in reducing carbon emissions and becoming more energy efficient. The IAA plans to implement a carbon emissions reduction strategy with the objective of reducing and offsetting our carbon footprint using the cut-convert-compensate model. The IAA will undertake highly focused energy efficiency projects on an annual basis to reduce the company's energy consumption supported by a structured environmental and energy management system to ensure that continual focus on CO2 reduction is achieved. We will transition to low carbon technologies and harness renewable energy sources while substituting remaining fossil fuel-derived energy sources for carbon-neutral energy sources.

**Table 45 Subscriptions (En Route and Terminal)**

<i>2017 prices</i>	<b>2019 €'000</b>	<b>2020 €'000</b>	<b>2021 €'000</b>	<b>2022 €'000</b>	<b>2023 €'000</b>	<b>2024 €'000</b>	<b>RP3 €'000</b>
En route	█	█	█	█	█	█	█
Terminal	█	█	█	█	█	█	█
<b>Total</b>	█	█	█	█	█	█	█

Subscription costs include the costs of the IAA's participation in the COOPANS Management Office and SESAR 2020 as well as the Borealis Strategic Alliance.

**Table 46 Administration (En Route and Terminal)**

<i>2017 prices</i>	<b>2019 €'000</b>	<b>2020 €'000</b>	<b>2021 €'000</b>	<b>2022 €'000</b>	<b>2023 €'000</b>	<b>2024 €'000</b>	<b>RP3 €'000</b>
En route	█	█	█	█	█	█	█
Terminal	█	█	█	█	█	█	█
<b>Total</b>	█	█	█	█	█	█	█

Administration costs include rent and rates, computing, insurance, buildings repairs and maintenance, security, cleaning, consultancy, audit, pension and legal fees, recruitment, medicals, employee wellbeing and health and safety, stationery and file storage. The significant items have been broken out as follows:

**Table 47 Breakdown of Administration Costs**

<i>En Route/Terminal 2017 prices</i>	<b>2019 €'000</b>	<b>2020 €'000</b>	<b>2021 €'000</b>	<b>2022 €'000</b>	<b>2023 €'000</b>	<b>2024 €'000</b>	<b>RP 3 €'000</b>
Rent and rates	█	█	█	█	█	█	█
Computing	█	█	█	█	█	█	█
NIS	█	█	█	█	█	█	█
Consultancy	█	█	█	█	█	█	█
Insurance	█	█	█	█	█	█	█
Building repairs	█	█	█	█	█	█	█
Security	█	█	█	█	█	█	█
Professional services	█	█	█	█	█	█	█
Cleaning	█	█	█	█	█	█	█
IAA restructuring	█	█	█	█	█	█	█
Other	█	█	█	█	█	█	█
<b>Total</b>	█	█	█	█	█	█	█

### ***Rent and rates***

The IAA rents several of its operational sites including its buildings at Dublin and Shannon airports as well as remote sites housing radars and other equipment. The ANSP's share of rent for its corporate headquarters is also included here. The increase in the charge from 2019 to 2020 is explained by higher rates charges following recent local government rates assessments. Otherwise this business plan assumes that rents will remain stable and that rates will not increase in real terms.

### ***Computing***

Computing costs comprise costs of computer hardware and software maintenance, agency costs of frontline ICT staff, ICT security and disaster recovery costs, costs of back-up and storage of data and costs of consumables. The increase in computing costs from 2019 reflects the increasing price pressure on existing hardware and software maintenance contracts, new contracts as new technologies are implemented and the increasing trend away from on-premise solutions towards software as a service.

### ***NIS – Network and Information Security***

The IAA is required to be compliant with the EU Directive on security of network and information systems (NIS Directive) from January 2020. This Directive mandates that the IAA has the capability to ‘identify, protect, detect, respond and recover’ regarding security issues. Therefore, as part of ensuring compliance with this Directive, the IAA needs to invest in its cyber defences to meet the increased risk profile caused by cyberthreats. These threats are becoming increasingly prevalent and sophisticated. This will also enable the IAA leverage digital technologies to share information more effectively.

### ***Consultancy***

The IAA typically engages external consultancies when specialised expertise is required. This could be in the fields of safety management, flight procedures, technology resilience, pay and pensions. This business plan assumes a relatively small increase over the course of RP3.

### ***Insurance***

Recent indications from the IAA’s insurance brokers is that the costs of aviation liability are set to increase. Other business insurances are also increasing on an annual basis.

### ***Building repairs***

The operational buildings occupied by the IAA are in increasing need of repair, maintenance and upgrade as well as the life-cycle renewal of building plant and equipment. Our main centre at Ballycasey is now 17 years old while at Dublin and Shannon airports the buildings are about 25 years old. The IAA has 27 remote operational sites around the country of varying ages which require a complete review in terms of structural integrity and regulatory compliance eg. fire safety and health and safety obligations to ensure that they remain fit for purpose and meet our operational requirements. It is known that the cost of buildings repairs will be higher in RP3 compared to RP2 due to the ageing property portfolio. In addition, the cost of the IAA’s facilities management contract, though subject to competitive tender, is expected to increase as overall costs of labour increase in the Irish economy.

### ***Security***

The IAA, as a provider of essential services within the State, have a legal and regulatory obligation to meet International, European and National security requirements. The introduction of the National Civil Aviation Security Programme (NCASP) by the State has

placed significant onus on the IAA to ensure that all of its properties, people, equipment and assets are protected appropriately. With 33 sites around the country the requirement for security systems, controls and management is now greater than ever. The IAA recently tendered, in an open competition, for security services for the next 5 years. The outcome of this exercise was that security costs have increased significantly compared to previous years due to labour cost increases, increased security management scope and the additional regulatory requirements and obligations placed on a security provider working for an ANSP. This Business Plan reflects the cost of the newly signed security contract 2019-2023.

### ***Professional services***

Professional services comprise the costs of audit and audit-related fees, taxation, pension administration, pension actuarial and advisory and legal fees. This business plan assumes a modest increase in charges in RP3 to reflect the fact that some of these services will be subject to tender in the coming months.

### ***Cleaning***

The increasing cost of labour in the Irish economy is causing an upward trend in the costs of labour-intensive services such as cleaning. The IAA will shortly tender, as part of its facilities management contract, for cleaning services for its sites. It is anticipated that the contract price will increase significantly in RP3 when compared to RP2 not only due to rising labour costs but also due to the addition of new properties ie the en route contingency centre and the new tower. This business plan reflects that increase.

### ***IAA restructuring***

As noted previously in this Business Plan, it is Government policy that the IAA's air traffic control activities should be separated from the IAA's functionally separate safety regulation activities. This will result in additional costs to be borne by the ANSP in the areas of staff costs, operating costs, depreciation and cost of capital. The table below sets out the additional operating costs that have been included in this Business Plan. For a complete view of the cost impact of this restructuring, see part 10 of this section.



**Table 48 Breakdown of IAA restructuring-related operating costs**

<i>En Route/Terminal 2017 prices</i>	<b>2020 €'000</b>	<b>2021 €'000</b>	<b>2022 €'000</b>	<b>2023 €'000</b>	<b>2024 €'000</b>	<b>RP 3 €'000</b>
Rent and rates	█	█	█	█	█	█
Computing	█	█	█	█	█	█
Building repairs	█	█	█	█	█	█
Consultancy	█	█	█	█	█	█
Professional services	█	█	█	█	█	█
Staff-related	█	█	█	█	█	█
Cleaning	█	█	█	█	█	█
Other	█	█	█	█	█	█
<b>Total</b>	█	█	█	█	█	█

## 10.8 Capital Expenditure

This Plan is based on the assumption that the IAA will deliver into operational use capital projects with a value of €164.4 million. The IAA charges its capital costs only when projects have been brought into operational use. While every effort has been made to specifically identify the nature of each proposed capital investment, it is proposed that the IAA will treat its capital allowance for RP3 as a total amount to be capitalised of €164.4 million rather than specific allocations to specific services/type of project.

**Table 49 Value of Capitalised Projects by category**

	<b>Value of capitalised projects</b>					
	<b>2020 €'000</b>	<b>2021 €'000</b>	<b>2022 €'000</b>	<b>2023 €'000</b>	<b>2024 €'000</b>	<b>RP3 €'000</b>
Air traffic management	57,856	19,012	11,359	21,425	10,817	120,469
Communications	5,778	1,500	800	2,750	2,700	13,528
Surveillance	2,019	6,575	3,097	400	5,650	17,741
Navigation	3,050	5,550	1,350	950	1,765	12,665
<b>Total</b>	<b>68,703</b>	<b>32,637</b>	<b>16,606</b>	<b>25,525</b>	<b>20,932</b>	<b>164,403</b>

Some of the significant projects making up these totals include:

	Dates of Capitalisation	Value of Project €'000
<b><i>ATM Operations and Technology Projects</i></b>		
New visual control tower and parallel runway at Dublin	2020-2021	█
COOPANS ATM system	2020-2024	█
NAVAIDs replacement programme	2020-2024	█
Next Generation COOPANS (first phase)	2023	█
RADAR replacement at woodcock hill	2024	█
SWIM	2023	█
Voice Over Internet Protocol	2020-2024	█
VHF replacement and frequency expansion	2020-2024	█
North Dublin RADAR	2021	█
Replacement COOPANS hardware	2020	█
NIS directive - system resilience	2020-2024	█
Other ATM Operations and Technology projects	2020-2024	█
<b>Total ATM Operations and Technology</b>		<b>121,593</b>
<b><i>Property, Security and ICT Projects</i></b>		
Plant and equipment upgrades	2021-2024	█
North Dublin RADAR building	2022	█
Upgrade of operational buildings	2021-2024	█
Security upgrades	2021-2024	█
Other property and security projects	2020-2024	█
ICT projects - various	2020-2024	█
<b>Total Property, Security and ICT projects</b>		<b>32,250</b>
<b><i>Projects driven by IAA restructuring</i></b>		
Accommodation fit-out and ICT	2020	█
<b>Grand Total</b>		<b>164,403</b>

## Depreciation

Depreciation is calculated to write off the cost of each fixed asset, including equipment purchased as part of an installation, on a straight-line basis over its expected useful life at the following annual rates:

Buildings	5%
Completed installations and other works	8 <sup>1</sup> / <sub>3</sub> % - 12 <sup>1</sup> / <sub>2</sub> %
Office Equipment	20% - 33 <sup>1</sup> / <sub>3</sub> %

Assets are depreciated from the date they are commissioned for use. Assets under construction/installations in progress are carried at historical cost and are not depreciated until they are brought into use. The carrying amounts of tangible fixed assets are reviewed at each reporting date to determine whether there is any indication of impairment. The charge for depreciation, based on the assets above being capitalised over the course of RP3 is as follows:

**Table 50 Cost of Depreciation**

<i>Nominal prices</i>	<b>2020 €'000</b>	<b>2021 €'000</b>	<b>2022 €'000</b>	<b>2023 €'000</b>	<b>2024 €'000</b>	<b>RP3 Total</b>
En Route	11,154	12,150	13,070	13,804	14,495	<b>64,673</b>
Terminal	5,976	8,023	9,333	9,669	10,181	<b>43,182</b>
<b>Total</b>	<b>17,130</b>	<b>20,173</b>	<b>22,403</b>	<b>23,473</b>	<b>24,676</b>	<b>107,855</b>

Depreciation of the new Dublin Tower and associated parallel runway equipment comprises €18.2 million of the RP3 depreciation charge, while depreciation on IAA restructuring related assets totals €10 million over the course of RP3.

## 10.9 Cost of Capital

The IAA engaged First Economics to produce an estimate of the IAA’s cost of capital for both its en route and terminal services. A copy of the report is attached.

The assumptions used in deriving a range for the cost of capital are as follows:

**Table 51 Cost of Capital**

	<b>Low</b>	<b>High</b>
Gearing	0.1	0.1
Cost of debt	2.5%	2.5%
Cost of equity pre tax	5.28%	6.67%
Cost of equity post tax	4.62%	5.83%

Based on these inputs, the proposed range for the IAA’s real pre-tax cost of capital is between 5% and 6.3%. This Plan adopts a pre-tax rate of 6%.

## 10.10 Restructuring of the IAA

During RP2, the Government signalled its intention to separate the safety regulatory functions of the IAA from its air traffic control functions. Progress is ongoing, and this Plan assumes that there will be two new entities from 1 January 2020. If the project is delayed beyond 1 January 2020 there may be additional costs which are not included in this Plan, but which may be quantifiable in advance of the national performance plan being submitted to the EC.

The impact of the restructuring on the ANSP’s cost base is driven by the following factors:

- 1) The restructuring process assumes that all of the corporate support services staff of the IAA will transfer to the ANSP. The share of these staff costs previously borne by the Regulator will now be borne 100% by the ANSP (see below for financial impact).
- 2) The indirect costs/corporate costs of the IAA eg audit fees, pension administration, staff-related costs, communications etc previously shared with the Regulator will now be borne 100% by the ANSP (see below for financial impact).

- 3) The ANSP will vacate the Head Office that it currently shares with the Regulator. A working group established to consider the possibility of co-location with the Regulator has concluded that is not possible for both entities to remain in the current building (see below for financial impact).

These costs of restructuring have been included in the IAA's total en route and terminal cost base as set out in part 4 of this section but, for clarity, the financial impact has been separately reported below.

**Table 52 Financial Impact of Restructure during RP3 (En Route)**

En Route	Ref	2020 €'000	2021 €'000	2022 €'000	2023 €'000	2024 €'000	Total €'000
Staff costs	1	500	517	524	531	537	2,609
Other operating	2	2,337	2,358	2,369	2,386	2,407	11,857
Depreciation	3	1,314	1,752	1,752	1,752	1,752	8,322
Cost of Capital	3	405	524	411	288	160	1,788
<b>Total – real</b>		<b>4,556</b>	<b>5,151</b>	<b>5,056</b>	<b>4,957</b>	<b>4,856</b>	<b>24,576</b>
<i>Impact on unit rate (real 2017 prices)</i>		€0.96	€1.08	€1.03	€1.00	€0.96	

**Table 53 Financial Impact of Restructure during RP3 (Terminal)**

Terminal	Ref	2020 €'000	2021 €'000	2022 €'000	2023 €'000	2024 €'000	Total €'000
Staff costs	1	143	148	150	152	153	746
Other operating	2	487	491	493	497	501	2,469
Depreciation	3	270	360	360	360	360	1,710
Cost of Capital	3	202	262	205	144	80	893
<b>Total – real</b>		<b>1,102</b>	<b>1,261</b>	<b>1,208</b>	<b>1,153</b>	<b>1,094</b>	<b>5,818</b>
<i>Impact on unit rate (real 2017 prices)</i>		€5.81	€6.44	€6.08	€5.68	€5.30	

## 11 Conclusion

The IAA has achieved RP2 targets ahead of schedule, including Level D for Effectiveness of Safety Management in 2016, and is committed to achieving the Commission's Safety targets for RP3. Ireland's performance with respect to ATM attributed delay has been exceptional and this business plan identifies the necessary requirements to ensure this level of performance is sustainable throughout RP3.

It is, however, of critical importance that the costs identified in this performance plan that are required to meet these targets are accepted despite the slight variance with the Union-wide cost efficiency targets. In this regard, it is important to emphasise that a mechanistic one-size-fits-all approach to resolving the problems on the European network will not succeed if these standardised targets are rigorously enforced across Europe as it will merely result in unrealistic targets for some States, without effectively targeting those States where problems exist. Such an approach would be counterproductive as it penalises those States, such as Ireland, who have contributed effectively to SES to date.

Ireland has worked constructively with the EC and PRB and engaged fully at SSC in order to ensure that EC targets are focussed towards those areas where problems exist, while efficient service providers are allowed sufficient scope to continue to invest in delivering a high quality service. It is recognised that delays are a significant concern for airlines in particular in the European core region. For this reason, we are of the view that the implementation of the RP3 targets must focus on those regions which are causing / generating delays. For other regions which have managed to maintain a low delay service even as traffic has increased well beyond RP2 forecast levels, the focus for RP3 must be on maintaining this high quality service and ensuring that further traffic increases in the next five years can be managed in a sustainable manner.

Having consistently delivered low unit rates in RP1 and RP2, we continue to have one of the lowest unit rates Union-wide. However, for reasons set out in this plan, further reductions to our charges is not achievable or practical.

Notwithstanding the slight variance between our cost requirements and the Union-wide cost efficiency targeted reduction of 1.9% per year, we will continue to offer excellent value for money to our customers.

## Appendix 1 – RP2 Performances

Ireland met all its national targets<sup>22</sup> across the 4 Key Performance Areas (KPA) during 2015-2017. At the same time, traffic in Ireland exceeded that forecasted within the UK-IR Performance Plan by 10% in en-route and 13% in terminal areas during 2016. The Irish RP2 targets and performance thus far in RP2 for KPIs assessed by the PRB in their final targets report are outlined within the Annex.

In terms of cost efficiency, the actual unit cost has been significantly less than the Determined Unit Cost (DUC) that was planned within the RP2 Performance Plan. Although the 2017 actual unit cost rose from 2016 to reach a similar level to 2015, it was still over 10% lower than the planned unit cost.

The IAA (ANSP) has made it clear that current cost levels and their rate of decrease - and thus the current unit rate - cannot be maintained in RP3 whilst upholding the same quality of service. This is due to both capital expenditure (CAPEX) and staffing requirements. Many CAPEX costs have had to be postponed during RP2 so far. This is both because of project related delays and the reprioritisation of engineering staff, who needed to assist in the delivery of short-term service requirements in the face of higher-than-expected traffic growth.

Staff costs to date for RP2 are lower than forecast DCs due to higher than expected departures, retirements and recruitment occurring later than anticipated. Recruitment has now started to address the shortfall, albeit at a slower rate than anticipated. Similarly, resource issues have led to a delay in capital projects, resulting in lower operating costs. Efficiencies have also been realised through strong procurement and budgeting procedures with competitive quotes being sought on significant tangible transactions. Operating budgets are actively monitored throughout the year.

As a result of the operational pressures of significantly higher than forecast traffic, as well as lower technology engineers than planned, staff that were earmarked for project deployment have been redeployed to operational roles (e.g. maintenance or removed from project support), delaying project deployment. Therefore, the IAA ANSP has so far spent significantly less on CAPEX in RP2 than planned. Staff numbers available to deliver Capex projects have increased in 2018 and allowed for capex projects to be prioritised. These additional staffing resources have allowed the ANSP to begin 'catching up' on its capex plans.

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<sup>22</sup> Safety, terminal capacity and cost efficiency KPIs are targeted at national level in the UK-Ireland FAB Performance Plan for RP2. En-route capacity and environmental KPIs are targeted at FAB level. Some FAB level targets were not met, although Ireland met all their requirements towards these targets.

<b>Safety RP2 KPI results</b>					
<b>Level of Effectiveness of Safety Management (for States)</b>					
	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
PP	B	B	C	C	C
Actual	C	C	C	C	-
<b>Level of Effectiveness of Safety Management (for ANSPs)</b>					
	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
PP (Safety Culture MO)	C	C	C	C	C
Actual (Safety Culture MO)	D	D	D	D	-
PP (All other MOs)	C	C	C	C	D
Actual (All other MOs)	C	D	D	D	-

<b>Application of Risk Analysis Tool (RAT) Methodology</b>						
<b>ATM Overall</b>		<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Separation Minima Infringements (SMIs)	PP	80%	80%	80%	80%	80%
	Actual	100%	100%	100%	100%	-
Runway Incursions (RIs)	PP	80%	80%	80%	80%	80%
	Actual	100%	100%	100%	100%	-
ATM Specific Occurrences (ATM-S)	PP	80%	80%	80%	80%	100%
	Actual	100%	100%	100%	100%	-



Application of Risk Analysis Tool (RAT) Methodology						
ATM Ground		2015	2016	2017	2018	2019
Separation Minima Infringements (SMIs)	PP	80%	80%	80%	80%	100%
	Actual	100%	100%	100%	100%	-
Runway Incursions (RIs)	PP	80%	80%	80%	80%	100%
	Actual	100%	100%	100%	100%	-

Environment RP2 KPI results <sup>23</sup>					
Average horizontal en route flight efficiency of the last filed flight plan (KEA)					
	2015	2016	2017	2018	2019
PP (FAB)	3.36%	3.27%	3.18%	3.09%	2.99%
Actual (FAB)	3.47%	3.85%	3.70%	3.63%	-

Capacity RP2 KPI results					
En-Route ATFM delay per flight					
	2015	2016	2017	2018	2019
PP (FAB)	0.25	0.26	0.26	0.26	0.26
Actual (FAB)	0.08	0.30	0.16	0.28*	-

The average en-route delay per flight in Ireland was 0.00. Therefore, no corrective measures have been required.

<sup>23</sup> The KEP KPI is not reported in the UK-IR Monitoring Report 2018, but rather is tracked at a network level. The KEA KPI is reported at FAB level, unlike the safety and terminal cost efficiency KPIs which are targeted and reported at national level. For context, the 2017 KEA value for Ireland was 1.35%, demonstrating that at a national level, Ireland falls well under the FAB and Union-wide targets.

<b>Cost efficiency RP2 KPI results</b>					
<b>Determined Unit Cost (DUC) for en-route ANS</b>					
	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
<i>Determined (EUR)</i>					
Total en-route ANS costs in nominal terms	118,046,200	121,386,700	125,595,100	129,364,400	130,778,800
Inflation (%)	1.10%	1.20%	1.40%	1.70%	1.70%
Inflation index (base = 100 in 2009)	103.72	104.97	106.43	108.24	110.08
Total en-route ANS costs in real terms (2009 prices)	113,811,728	115,644,664	118,001,964	119,511,684	118,798,780
Total en-route Service Units (TSU)	4,000,000	4,049,624	4,113,288	4,184,878	4,262,135
Real en-route unit cost (2009 prices)	28.45	28.56	28.69	28.56	27.87

<b>Cost efficiency RP2 KPI results</b>					
<b>Determined Unit Cost (DUC) for en-route ANS</b>					
	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
<i>Actual (EUR)</i>					
Total en-route ANS costs in nominal terms	106,657,766	108,543,638	113,784,000	117,777,000	-
Inflation (%)	0.00%	-0.20%	0.30%	0.70%	-
Inflation index (base = 100 in 2009)	102.29	102.08	102.39	103.10	-
Total en-route ANS costs in real terms (2009 prices)	104,273,918	106,330,301	111,130,414	114,230,678	-
Total en-route Service Units (TSU)	4,182,450	4,467,595	4,465,253	4,549,883	-
Real en-route unit cost (2009 prices)	24.93	23.80	24.89	25.11	-



## Appendix 2 – Independent Cost of Capital Report