Irish Draft Performance Plan
for Air Navigation Services
in Reference Period 3 (RP3) of the
Single European Sky Regulation

Consultation Document

30 July 2021

Prepared by the joint National Supervisory Authorities (NSAs):

Commission for Aviation Regulation (CAR)

Irish Aviation Authority Safety Regulation Division (IAA SRD)

Table of Contents

1. Executive Summary

1.1 This document sets out our proposals for Ireland's revised Reference Period 3 (RP3) Performance Plan for consultation. Ireland's original RP3 Performance Plan was prepared, consulted on, and submitted in 2019 in line with the provisions of Commission Implementing Regulation (EU) 2019/317 and the targets set out in Commission Implementing Decision (EU) 2019/903. However, the impact of COVID-19 on the aviation sector meant that revisions to RP3 Performance Plans, targets and the implementing regulations would be required. After this consultation period has concluded, a final draft RP3 Performance Plan will be submitted to the EU Commission by 1 October 2021.

1.2 This Performance Plan covers En Route air navigation services in the Shannon Flight Information Region (FIR) and Shannon Upper Information Region (UIR). It also covers Terminal services provided at Dublin, Shannon and Cork airports. The National Supervisory Authority (NSA) does not propose to make any changes to the scope of the Performance Plan or the Charging Zones as part of this revision of the plan.

1.3 The Performance Plan covers costs of the following entities: The IAA ANSP, MET ANSP, NSA costs, State policy costs, ICAO and ECAC costs and Eurocontrol costs. The costs all relate to the provision of air traffic management services and are payable by airspace users (primarily airlines).

1.4 Once adopted, the revised RP3 Performance Plan will apply for the original years of RP3, from 2020 to 2024. Allowed revenue which is unrecovered in 2020 and 2021, due to the impact of COVID-19, is potentially recoverable through adjustments to unit rates in subsequent years from 2023.

1.5 In total, in 2017 prices, we propose Determined Costs for all entities of €681m for the 5 years 2020 to 2024. This compares to €758m in the various business plans and €911m in the 2019 draft Performance Plan.

Assumptions and traffic forecasts

1.6 Traffic forecasts are used to convert the total Determined Costs into a Determined Unit Cost (DUC). We use Scenario 2 from the Eurocontrol May 2021 forecast which projects an easing of travel constraints from Q1 2022. This scenario sees En Route Service Units for Ireland at 2.1m in 2021 increasing to 4.7m by 2024, this compares to 4.6m in 2019. Terminal Service Units are forecast to be 77k in 2021, increasing to 136k in 2022 and then back to 2019 levels, at 188k, by 2024. This scenario aligns with the IAA ANSP's Business Plan assumption.

1.7 Following advice from the European Commission, the Performance Plan may be revised post submission to reflect revised Eurocontrol forecasts expected to be published in October 2021.

1.8 In line with Article 2(11) and Article 26 of Regulation 317/2019, we use the forecast of average Consumer Price Index (CPI) change from the International Monetary Fund (IMF), which was published in April 2021. It forecasts that inflation will be, on average, 1.4% per year between 2020 and 2024.

The IAA ANSP's Determined Costs

1.9 In total, in 2017 prices, we propose Determined Costs for the IAA ANSP of €99.5m in 2020 increasing to €119m in 2022 and then €124.8m in 2024. This compares to a cost level of €115m in 2019. Of this cost base, in 2020, €82.8m is allocated to En Route, with €16.7m allocated to terminal (€98.4m and €26.4m respectively in 2024).

IAA ANSP - Operating Costs

1.10 For the IAA ANSP's operating costs, we propose €89m in 2020 rising to €105m in 2024, compared to the 2019 outturn of €99m. This is a lower level than proposed in the IAA ANSP's business plan - €90m in 2020 increasing to €118m in 2024.

1.11 The IAA ANSP's past and forecast future operating costs are assessed in Section 4. Operating costs decreased in 2020 and 2021 relative to 2019, due to the implementation of COVID-19 related cost containment measures. From 2022 onwards, we expect that operating costs will rebound and increase gradually thereafter, as traffic recovers towards 2019 levels.

1.12 Staff costs are forecast to decrease overall from 2019 to 2021, and then increase from 2022 in line with traffic growth and increased headcount requirements in certain business units, which, as well as traffic, is also associated with the delivery of capital projects and safety related requirements imposed by EU Regulation 2017/373. The reduced staff costs in 2020 and 2021 are the result of reduced headcount, a voluntary severance scheme, reduced working hours, reduced overtime, and the Government's employee wage subsidy scheme. There is also a variety of cost containment measures assumed to have been implemented to achieve reductions from 2019 in non-staff operating costs for 2020 and 2021.

1.13 Many non-staff cost items are relatively insensitive to traffic levels and as such, with a return to 'normal' operations expected next year, are forecast to return to 2019 levels from 2022 and remain constant in real terms for the rest of the period. As is the case with staff costs, operational costs will increase as new capital projects begin. Similarly, training costs are expected to increase in line with the required timeline for increased ATCOs.

1.14 The allocation of operating costs between En Route and Terminal is based on an operating cost report, and model, produced by Steer. Many of the allocations are aligned with the IAA ANSP business plan, with the exception of ATCO numbers which are driven by Steer's bottom-up modelling, with some variances observed.

IAA ANSP - Capital Investments and Capital Costs

1.15 In total, we propose capital costs for the IAA ANSP of €10.4m in 2020 increasing to €21.6m by 2024, this is lower than the levels proposed in ANSP's business plan which are €10.8m for 2020 increasing to €28.9m by 2024. The difference between our proposal and that of the IAA ANSP is driven by a lower cost of capital, asset life assumptions which are overall longer, and a lower allowance for capital expenditure in the period.

1.16 Our assessment of capital costs is set out in Sections 5, 6, and Appendix 1.

1.17 We have set the real weighted average cost of capital (WACC) at 4% for 2022-2024, but at 3.5% for 2020 and 2021. The range of values estimated is between a low of 2.8% and a high of 4.2%, with a point estimate of 4% (we have included an 'aiming up' allowance within the estimation of the WACC, of 0.5%, from 2022 only). The estimated range is below the point estimate for the real WACC of 5% in the IAA ANSP Business Plan. The nominal WACC in each year of RP3 ranges from 3% in 2020 to 6.1% in 2024. To calculate this, the point estimate of the real WACC has been converted to a nominal WACC.

1.18 The IAA ANSP has kept its asset register at historical cost (i.e. in nominal prices). Consequently, the RAB we have derived from the asset register is nominal, and thus a nominal WACC is applied to derive the return on capital.

1.19 The IAA ANSP has proposed a revised capital investment programme for RP3 as part of the revision of the overall Performance Plan. While we broadly accept the merits of the proposed programme and the associated level of expenditure, we consider that, at a programme level, the efficient level of expenditure to deliver the full set of projects is likely somewhat lower than the cost submissions provided by the ANSP, while we consider that the timeline proposed is ambitious. Therefore, rather than disallowing any individual projects or adjusting costings at a project level, we propose to make a programme level reduction of 20% to forecast capitalisations (excluding expenditure associated with Dublin tower), over 2021-2024. This level of allowed expenditure is, in our view, more likely to reflect the actual level of expenditure during RP3 relative to what the IAA ANSP has proposed. To the extent that the IAA ANSP incurs efficient expenditure on necessary capital projects during RP3 in excess of the 80% allowance, we will take this into consideration in RP4.

1.20 We also propose to adjust the assumed asset lives for several RP3 projects. The individual adjustments are noted and listed in Appendix 1 and can be observed (and adjusted to test sensitivities) in the financial model. This adjustment reflects our observation that the asset lives of a number of projects or elements of projects were shorter than we expect.

MET ASD, NSA, and other State and Eurocontrol Costs

1.21 MET Aviation Services Division (ASD) has put forward cost proposals for RP3 which we consider to be reflective of enhanced efficiency in service delivery, and include only eligible costs. Steer considers that, given the level of cost savings proposed relative to RP2, further detailed scrutiny of the cost proposal is not warranted. We propose to reflect these costs, €8.2m in 2020 and remaining broadly flat over the period, in the Performance Plan.

1.22 With regards to the NSA, and consistent with cost estimations in the original RP3 Performance Plan, reported supervision costs are expected to be higher for RP3 than they were for RP2. Previously reported supervision costs did not reflect the full costs of the oversight as they did not take account of corporate services such as IT, Finance and HR services. These costs now need to be reported as supervision costs due to the upcoming separation of the ANSP from the IAA and the subsequent merger of the IAA

SRD with CAR. Increases in staff costs are also expected in RP3. This results in NSA costs of €2.8m in 2020, increasing to €6.1m in 2024. This compares to a cost proposal from the NSA (finance section) of €6.6m in 2024. We asked Steer to review the NSA Business Plan proposal; their analysis is also published.

1.23 Other state costs are expected to increase by almost 8% from €10.4m in 2020 to €11.2m 2024. This includes costs for State Policy, ICAO and Eurocontrol.

Key Performance Area (KPA) Targets

1.24 For the safety targets, consistent with the provisions of Commission Implementing Decision (EU) 2021/891, the NSA intends to mandate that the IAA ANSP shall comply with the Union-wide targets during RP3 by ensuring Effectiveness of Safety Management (EoSM) that is at least "Level D" in the objective of safety risk management and at least "Level C" in the other safety objectives of culture, policy and objectives, promotion, and assurance.

1.25 For the environment targets, the key performance indicator is the average horizontal En Route flight efficiency of the actual trajectory of aircraft (KEA). This measures the average additional distance flown compared to the great circle distance, which is the shortest distance between two points on the surface of a sphere. We propose that the Performance Plan will align with the targets assigned to Ireland.

1.26 There are two KPIs within the KPA of capacity, one relating to En Route capacity and one relating to terminal capacity, these are: the average En Route ATFM delay minutes per flight attributable to air navigation services, and the average arrival ATFM delay minutes per flight attributable to terminal and airport air navigation services. For the En Route capacity target, we propose to align the Performance Plan with the revised targets assigned to Ireland. The original Terminal target was 0.25 minutes for 2021, and 0.2 minutes for 2022-2024. We do not propose to change these targets.

1.27 The cost efficiency KPA includes two KPIs: the Determined Unit Cost (DUC) for En Route services and the DUC for terminal services. To calculate an appropriate level of allowed determined costs for the ANSP in RP3, the NSA has followed the regulatory building blocks approach. This approach is intended to build the cost base from the bottom up, rather than targeting a specific overall outcome. The building blocks used include, as outlined above, an efficient level of operating costs, depreciation charges, the cost of capital based on the allowed asset base and an efficient WACC.

1.28 Applying this approach has led to an En Route DUC trend which is €1.09 (2.8%) lower than the equivalent value implied by the Union-wide DUC target. There is some year-to-year variation in the DUC trend we propose relative to the EU-wide values, which is a feature of local circumstances, particularly traffic forecasts; our proposal would lead to significant outperformance in 2020/2021, underperformance in 2022, and then performance very close to the target in each of 2023 and 2024.

Unit Rate Forecasts

1.29 The En Route unit rate for 2021 is €28. On the basis of our proposed Performance Plan,

we forecast that, in nominal terms and under our core traffic scenario, this rate would increase to €35.80 in 2022, before reducing to €32 and then €30 for 2023 and 2024 respectively.

1.30 The Terminal unit rate for 2021 is €162. We forecast that, in nominal terms, this rate would increase to €178 for 2022, before reducing to €173 and then €175 for 2023 and 2024 respectively.

1.31 The unit rates would be subject to change within the period due to adjustments such as reductions if inflation is below the forecasts, and traffic risk sharing. The variance between these rates and the rates which would result from the IAA ANSP Business Plan is set out in Section 11.

Consultation

1.32 This is a consultation rather than decision document; we anticipate that changes will be made to our initial proposals on the basis of consultation submissions and feedback. Responses may address any aspect of our proposals.

1.33 The statutory consultation meeting will take place on **Thursday 26 August 2021, at 2pm to 5pm Irish time.** Written responses should be received no later than **5pm (Irish Time), Tuesday 31 August 2021.**

2. Background and Process for Developing a Revised Performance Plan

2.1 This section provides an overview of the context in which we are revising the RP3 Performance Plan, both at a European level and specifically in Ireland. It then sets out the process followed by the NSA to date, and the next steps, as well as providing a guide to this consultation.

European Context

2.2 The original RP3 Performance Plans were prepared and consulted on throughout 2019 in line with the provisions of Commission Implementing Regulation (EU) 2019/317 and the targets set out in Commission Implementing Decision (EU) 2019/903. Ireland's draft Performance Plan was submitted in October 2019, with the PRB review process set to conclude in March 2020; however, the impact of COVID-19 on the aviation sector meant that revisions to RP3 Performance Plans, targets and the implementing regulations would be required.

2.3 In November 2020, Commission Implementing Regulation (EU) 2020/1627 was passed; this legislation contained exceptional measures in response to the impact of COVID-19 and a revised timeline for the submission of updated RP3 performance plans. In June, revised targets were published within Commission Implementing Decision (EU) 2021/891. Revised RP3 Performance Plans will be submitted by 1 October 2021, with review and decision on approval and formal adoption of the revised performance plans, by the EC, taking place in the following months. The EC has also suggested that Performance Plans could be updated in light of revised traffic forecasts during the verification of completeness phase later this year, throughout October and November.

Institutional Context for ANS Provision and Oversight in Ireland

2.4 In line with Irish government policy, the institutional framework for the provision of air navigation services, and the oversight of these services, is currently undergoing a process of change. The Irish Aviation Authority (IAA) is being separated into its two constituent parts, the Air Navigation Services Provider (ANSP), and the Safety Regulation Division (SRD). SRD will remain as the IAA, while the ANSP will be incorporated as a new commercial company. The existing, separate Commission for Aviation Regulation (CAR), which has roles in economic regulation, licensing, and consumer protection in aviation, will then be merged into the IAA to form a new independent sectoral regulator with responsibility for aviation regulation in relation to safety, security, licensing, economic regulation, and passenger rights.

2.5 The development and submission of the original RP3 Performance Plan in 2019 was carried out within the IAA, as the designated NSA under the SES performance and charging regulation. The designation as NSA responsible for economic regulation and cost efficiency was transferred to CAR on 1 January 2020. The SRD function of the IAA has retained NSA responsibilities under the SES other than economic regulation, including safety oversight and licensing.[1] When the merger is completed, all of these oversight functions will sit within the new regulator, as will be established under the

[1] Further details are here:
https://www.aviationreg.ie/economic-regulation/air-navigation-charges.986.html

Air Navigation and Transport Bill 2020.[2] Section 10 provides for the Minister to identify a day (the Vesting Day) from which the separation of the ANSP and the establishment of the single independent aviation regulator will take effect; it is anticipated that the Vesting Day will be later in 2021.

2.6 Consequently, in this document, where we refer to 'the NSA', this should be taken to mean both CAR and the IAA SRD jointly, in advance of vesting day. From vesting day, 'the NSA' should be taken to refer to the IAA. Where we refer to 'the IAA ANSP', in advance of vesting day, this refers to the ANSP currently contained within the IAA. From vesting day, 'the IAA ANSP' should be taken to refer to the Designated Activity Company (DAC) referred to in Section 10 of the Air Navigation and Transport Bill 2020. We currently understand that this company is likely to trade under the name 'AirNav Ireland', as provided for under Section 11 of the Bill.

Process for Developing a Revised Irish Performance Plan

2.7 Following the passage of EU 2020/1627, in late 2020, the NSA and ANSPs began to prepare for the requirement to develop a revised Performance Plan for RP3. In particular, given that CAR was not involved in the original Performance Plan, it was necessary to develop entirely new inputs and forecasts for each of the regulatory building blocks (including, for example, deriving the full RAB).

2.8 In November, the NSA issued a consultation on a proposed timeline for developing the revised plan.[3] In February, CAR provided business plan guidance material to IAA ANSP, with guidance provided to MET ASD in March. Draft Business Plans were provided by both entities in April, with the final business plans provided in July, while an NSA supervision costs proposal was provided in May.

2.9 A proposed draft Performance Plan has now been developed by the NSA on the basis of these submissions, which is the subject of this public consultation. Following this consultation, the draft plan will be finalised in September 2021 and submitted to the EU Commission by 1 October 2021.

Scope of the Performance Plan

2.10 The Performance Plan covers En Route air navigation services in the Shannon Flight Information Region (FIR) and Shannon Upper Information Region (UIR). It also covers Terminal services provided at Dublin, Shannon and Cork airports. Although Cork and Shannon are below the inclusion threshold of 80,000 IFR movements, they were optionally included in the original Performance Plan as provided for under Article 1(4) of Regulation 317/2019. The NSA does not propose to make any changes to the scope of the Performance Plan or the Charging Zones as part of this revision of the plan.

2.11 Shanwick Oceanic airspace, in which the IAA ANSP also provides air navigation services, is outside the scope of the Plan. Consequently, associated costs and revenues have been excluded from the Plan.

2.12 Once adopted, the revised RP3 Performance Plan will apply for the original years of

[2] https://www.oireachtas.ie/en/bills/bill/2020/72/
[3] https://www.aviationreg.ie/air-navigation-charges/performance-plan-with-revised-targets-for-rp3.1002.html

RP3, from 2020 to 2024. Revenue lost in 2020 and 2021, due to the application of the unit rates planned in the original RP3 performance plans being applied to much lower traffic levels (partly offset by lower than planned costs), is potentially recoverable through adjustments to unit rates in subsequent years from 2023. Consequently, with unit rates already set for 2020 and 2021, the level of Determined Costs for these years contributes to the level of future adjustments to the unit rates from 2023, rather than impacting unit rates and the regulated revenue stream this year.

2.13 For the purposes of the cost efficiency KPA, 2020 and 2021 will be treated as one period and a number of other bespoke measures will also apply; these are discussed below in the context of the relevant KPAs.

Responding to this Consultation

2.14 In order to allow all stakeholders to provide informed responses as part of a meaningful consultation, we have sought to provide as much detail and supporting material as possible. We have sought to minimise redactions and have encouraged the regulated entities to minimise redactions in their own submissions. For that reason, the following is also published alongside this document:

- Final business plan submissions from the regulated entities, as well as a submission from the NSA finance section in relation to NSA costs.
- A report from Steer which provides operating cost forecasts for RP3 for the IAA ANSP, which will be finalised in September, taking into account any submissions addressing its findings.
- Reports from Steer on the MET ASD and NSA costs we are proposing to include in the Performance Plan.
- The Performance Plan summary financial model.

2.15 The statutory consultation meeting will take place on **Thursday 26 August 2021, at 2pm to 5pm Irish time (3pm to 6pm Central European Time (CET)).**[4] Written responses should be received no later than **5pm (Irish Time), Tuesday 31 August 2021.**

2.16 Article 24(2) of 317/2019 requires no less than three weeks between the provision of the consultation material and the statutory consultation meeting. Our preference would have been to hold the consultation meeting approximately one week after publication of this document and supporting material, to then enable stakeholders develop their written responses in light of the discussions and any clarifications provided at the meeting. However, the statutory timelines preclude this approach. On that basis, we suggest that responses can be developed throughout August and can then be finalised subsequent to the meeting and submitted on 30 August.

2.17 Responses should be titled “Response to the Consultation on Draft Performance Plan for RP3” and sent by email to: Info@aviationreg.ie .

[4] This meeting will be held via Microsoft Teams. Those who wish to attend should register by emailing lukemanning@aviationreg.ie and adriancorcoran@aviationreg.ie

2.18 Respondents should be aware that we are subject to the provisions of the Freedom Information legislation. Ordinarily we publish all submissions received on our website. We may include or reference the material contained in submissions in our reports and elsewhere as required. If a submission contains confidential material, it should be clearly marked as confidential and a redacted version suitable for publication should also be provided.

2.19 We do not ordinarily edit submissions. Any party making a submission has sole responsibility for its contents and indemnifies us in relation to any loss or damage of whatever nature and howsoever arising suffered by us as a result of publishing or disseminating the information contained within the submission.

Performance Plan Financial Model

2.20 The Performance Plan summary financial model has been used to calculate the proposals set out in this document. We encourage stakeholders to make use of this model to fully understand the proposed Performance Plan, and to test the sensitivity of determined costs, unit rates, and financial performance to changes within areas such as the WACC components, cost allocation keys, capital costs, operating costs, and traffic levels. However, the consequent impact of a change in the baseline Service Unit forecasts on the Opex forecasts cannot be calculated in the model, except for two specific scenarios (+/-10%).

2.21 Each of the 'ANSP', 'MET', and 'Supervision' sections of the model feed the determined cost tables proposed for each entity in the model.[5] The total determined costs are then summed in the 'Total DC' section. The IAA ANSP proposals, as modelled by us, have also been included on separate sheets for comparison purposes. Note that within the 'ANSP Capex CAR' sheet, which contains our adjustments to the proposed Capex programme, adjustments can be made either at a programme level (cell I42), or at an individual line item level within the asset register in column I. Asset life adjustments can be inputted in years in column K.

2.22 The 'UR' section then compiles the various aspects of the regulatory model and our proposed application of these aspects to calculate forecast unit rates, after applying relevant unit rate adjustments.

2.23 Finally, the 'Summary' section, at the front of the model, summarises and displays the resulting unit rate and cost forecasts from a number of perspectives, IAA ANSP regulated entity profitability, coverage ratios, and cash flow forecasts.

[5] The section termed 'Supervision' includes Eurocontrol costs, NSA costs, and state policy costs from the Department of Transport.

3. Inflation and Traffic Forecast Assumptions

3.1 This section sets out the inflation and traffic forecast assumptions used as inputs to the Performance Plan.

Inflation

3.2 In line with Article 2(11) and Article 26 of Regulation 317/2019, we use the forecast of average Consumer Price Index (CPI) change from the International Monetary Fund (IMF), which was published in April 2021.

Table 3.1: Actual and Forecast Inflation 2020-2024

	2020	2021	2022	2023	2024
Inflation	-0.5%*	1.6%	1.9%	2.0%	2.0%

*Source: IMF, April 2021. *In line with Article 2(11) of Regulation 317/2019, as inflation was negative, a zero value has been used for relevant non-WACC adjustments.*

Traffic Forecasts

3.3 We propose to base the Performance Plan on the Eurocontrol May forecast, Scenario 2, as has been recommended to NSAs. This is also the forecast upon which the IAA ANSP has based its final Business Plan submission. These forecasts are set out in Table 3.2.

Table 3.2: Eurocontrol Forecast 2020-2024, Scenario 2 (000's)

	Actuals	Forecast			
	2020	2021	2022	2023	2024
IFR Movements	263	277	459	562	652
YoY Change	-59.3%	5.2%	65.8%	22.5%	16%
En Route Service Units	1,988	2,072	3,202	4,039	4,726
YoY Change	-57.3%	4.2%	54.6%	26.1%	17%
Terminal Service Units	71	77	136	163	188
YoY Change	-62%	9%	77%	20%	15%

Source: Eurocontrol Forecast Update 2021-2024 (May 2021)

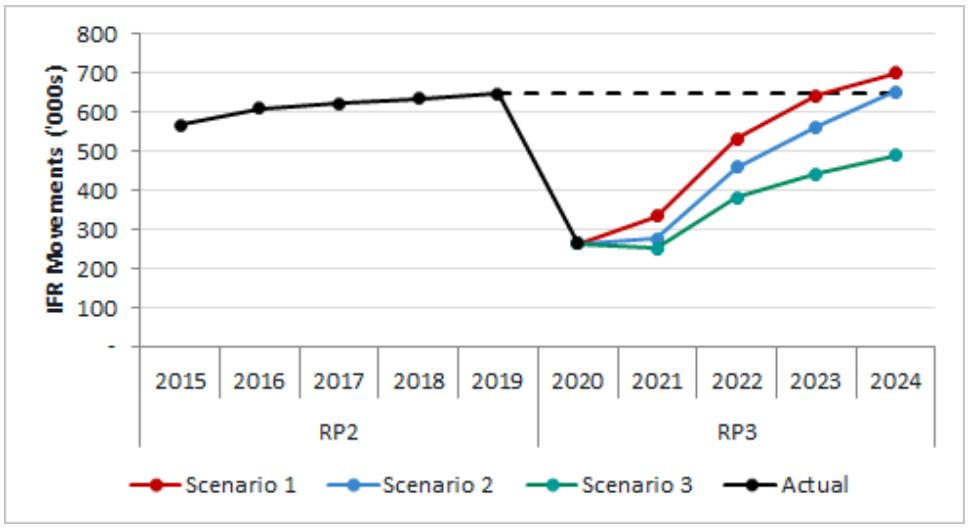
3.4 Eurocontrol's traffic forecasts for RP3, as of May 2021, are based on three scenarios with respect to the recovery from the impact of COVID-19. These are:

- **Scenario 1**: Vaccine Summer 2021, with easing of travel constraints as of Summer 2021;
- **Scenario 2**: Vaccine Summer 2022, with easing of travel constraints as of Q1 2022;
- **Scenario 3**: Lingering Infection, with ongoing restrictions and low passenger confidence.

3.5 Irish IFR movements, En Route service units (SUs) and Terminal SUs throughout RP2 and forecast for RP3 under the three scenarios are shown in the figures and tables below. Under Scenario 2, traffic and SUs are not projected to recover to 2019 levels

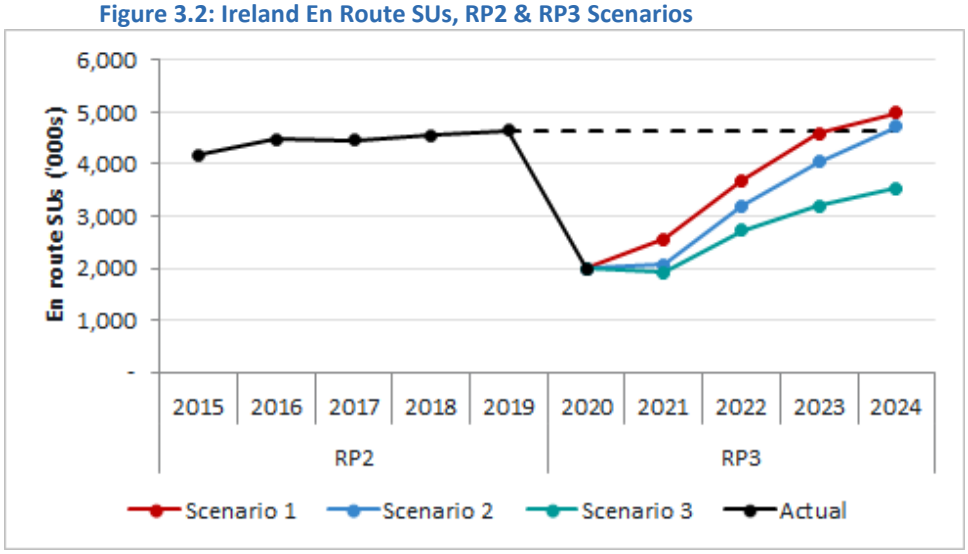
until 2024.

Figure 3.1: Ireland IFR Movements, RP2 & RP3 Scenarios



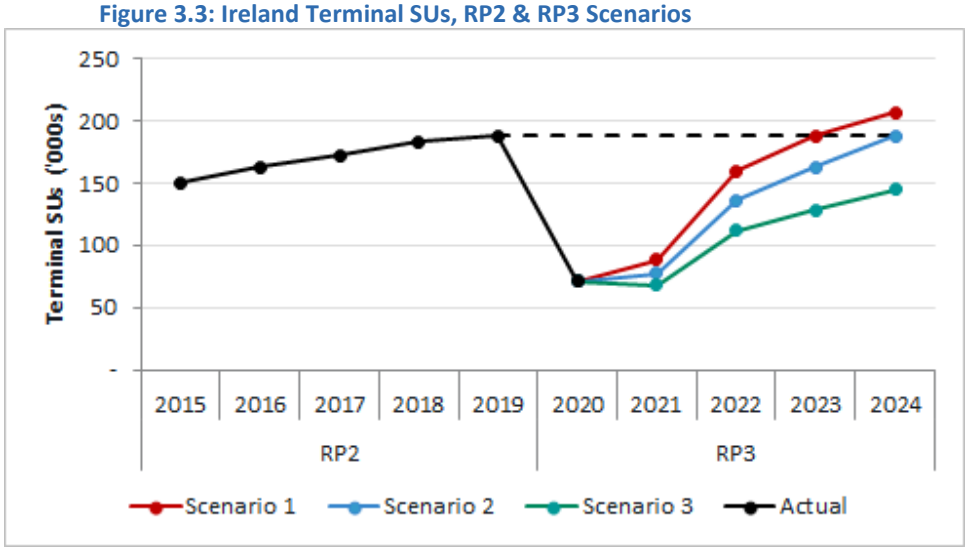
Source: Eurocontrol Forecast Update 2021-2024 (May 2021)

Figure 3.2: Ireland En Route SUs, RP2 & RP3 Scenarios



Source: Eurocontrol Forecast Update 2021-2024 (May 2021)

Figure 3.3: Ireland Terminal SUs, RP2 & RP3 Scenarios



3.6 In a letter dated 5 July 2021, the European Commission has stated that, given the level of uncertainty over traffic forecasts, NSAs may revise traffic assumptions during the verification of completeness planned for later this year. It has also requested that, as part of this consultation process, NSAs should quantify how such a revision would be expected to affect the parameters of the plan, in the event of a material change (upwards or downwards) in the traffic assumptions.

3.7 In Section 11, we therefore set out the anticipated impact of a 10% variation, both up and down, in each of Terminal and En Route service units on Determined Costs and forecast unit rates. It should be noted that, while the service unit forecasts (and the impact of the traffic risk sharing mechanism arising from deviations from forecasts within the period) could be calculated within the published Performance Plan model, the consequent impact of a change in the service units forecast on operating costs must be calculated through the Steer operating costs model, which is not published for confidentiality reasons.

4. Operating Expenditure

Table 4.1: Total, En Route and Terminal ANSP Operating Costs

Source	Allocation	Actuals		Determined				
		2019	2020	2020	2021	2022	2023	2024
CAR	En Route	€82m	€76m	€75m	€73m	€84m	€86m	€88m
	Terminal	€18m	€14m	€14m	€13m	€15m	€16m	€17m
	Total	**€99m**	**€90m**	**€89m**	**€86m**	**€100m**	**€103m**	**€105m**
ANSP	En Route	€82m	€76m	€76m	€77m	€94m	€98m	€99m
	Terminal	€18m	€14m	€14m	€15m	€18m	€19m	€19m
	Total	**€99m**	**€90m**	**€90m**	**€92m**	**€112m**	**€116m**	**€118m**

Source: IAA ANSP Business Plan, CAR Calculations, Steer Report. 2017 Prices.

4.1 In this section, we provide an overview of our proposals in relation to revised operating costs for RP3. Capital costs are considered separately in subsequent sections. We provide an overview of the report we commissioned from Steer, which considers the IAA ANSP's past operating costs trends, the cost containment measures in 2020 and 2021, and provides forecasts of operating costs for the rest of RP3. We then lay out the proposed allocation of these costs between the Terminal and En Route cost bases. Finally, we detail our proposed decision and our reasoning for the selected Steer scenario.

4.2 Operating costs decreased in 2020 and 2021 in comparison to 2019, due to the effects of COVID-19 and the cost containment measure implemented as a result. In 2022, we expect that operating costs will rebound to just above 2019 levels in real terms and increase gradually thereafter, as traffic recovers towards 2019 levels.

4.3 Staff costs are forecast to decrease overall from 2019 to 2021, and then increase from 2022 in line with traffic growth and increased headcount requirements in certain business units, primarily associated with the delivery of capital projects and safety related requirements imposed by EU Regulation 2017/373. There is also expected to be an increased ATCO requirement in 2023 and 2024 with the commencement of dual parallel runway operations at Dublin Airport in late 2022. The reduced staff costs in 2020 and 2021 are the result of reduced headcount, a voluntary severance scheme, reduced working hours, reduced overtime, and the Government's employee wage subsidy scheme. There is a variety of cost containment measures assumed to have been implemented to achieve reductions from 2019 in non-staff operating costs for 2020 and 2021.

4.4 Overall, for 2020, we assess that slightly higher savings could have been achieved by the IAA ANSP than were actually achieved, at 10.1% rather than 9.1%. For 2021, the IAA ANSP has suggested significant increases in certain non-staff line items are required, which is not supported by the Steer analysis. This leads to a higher variance with the NSA forecasts for the level of savings achievable relative to 2019, at 13.7% relative to the 7.1% proposed by the IAA ANSP.

4.5 Many non-staff costs lines are relatively insensitive to traffic levels and as such, with a return to 'normal' operations expected next year, are forecast to return to 2019 levels

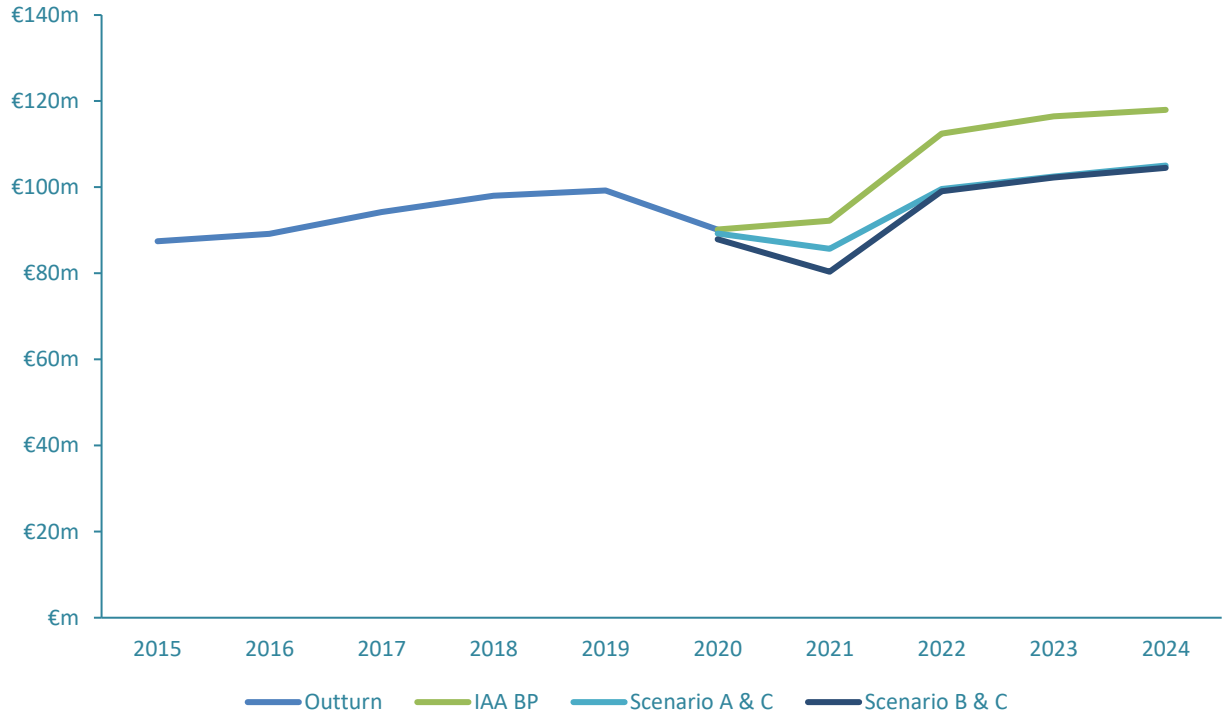
from 2022 and remain constant in real terms for the rest of the period. There are several exceptions to this, as described below.

4.6 The allocation of operating costs between En Route and Terminal cost bases is derived from the Steer analysis. Many of the allocations are aligned with the IAA ANSP business plan, except for ATCO numbers which are driven by Steer's bottom-up modelling, with some variances therefore observed. The commencement of dual runway operations at Dublin Airport is expected to lead to an increase in the proportion of ATCO costs allocated to Terminal, particularly from 2023.

Approach

4.7 Our proposed operating cost allowances are informed by analysis by Steer of the IAA ANSP operating costs, both actual and forecast, for 2020-2024. The Steer report is published alongside this document. It is our intention to ensure that the costs allowed in 2020 and 2021 are efficient and that a reasonable level of cost containment is assumed to have been achieved. This is particularly the case given that unrecovered Determined Costs which are not recovered in these years will be recovered from airspace users from 2023, rather than having an impact on the regulated revenue stream this year, as would ordinarily be the case. The report therefore assesses the response of the IAA ANSP in 2020 and 2021, and following on from that, forecasts an efficient level of operating costs for 2022-2024.

Figure 4.1: Operating Cost Outturns and Forecasts, IAA ANSP Business Plan and Steer Scenarios



Source: Steer, IAA ANSP

4.8 Steer developed two scenarios for the 2020/2021 'base year', against which to compare the savings made by the IAA ANSP. Scenario A is based on the level of savings achieved by ANSPs, while scenario B is influenced by the level of savings achieved by companies facing more substantial volume risk, in particular airports and airlines, while

taking into account factors that make the same level of savings more challenging for ANSPs. We are proposing to implement scenario A and C, which can be seen in Figure 4.1. The reasoning for this decision is outlined below. The table below outlines the operating costs per service unit with this scenario compared to the IAA ANSP business plan.

Table 4.2: En Route and Terminal Operating Costs per Service Unit, ANSP and Steer Scenarios A & C

Charging Zone	Source	2020	2021	2022	2023	2024
En Route	IAA ANSP	€38	€37	€29	€24	€21
	Steer	€38	€35	€26	€21	€19
Terminal	IAA ANSP	€196	€191	€133	€115	€100
	Steer	€198	€170	€112	€98	€91

Source: IAA ANSP Business Plan, Steer Report, CAR calculations, 2017 Prices.

Steer Report

4.9 The report consists of three main components. Firstly, Steer undertook background analysis of the ANSP operating costs during the RP2 period and in 2020. Secondly, an evaluation of the cost reduction measures implemented during 2020 and 2021 was conducted. Finally, Steer developed forecasts for 2022-2024 in the context of the IAA ANSP revised Business Plan submission.

Background Analysis and Historical Trends

4.10 Steer benchmarked historical performance in relation to several key indicators such as employment costs, ATCO in ops productivity and non-staff costs. Following an initial analysis of these areas, Steer compared operating costs over the period with the comparator group defined by the European Commission for RP1 and RP2.

4.11 Employment costs make up approximately 70% of operating costs and can be broken down into ATCOs in operational roles and all other employment costs. The cost of ATCOs in operations increased over the period, and overall employment costs grew over RP2 but at a rate less than the increase in traffic. When compared to the other ANSPs in the comparator group, IAA ANSP has the lowest costs per composite flight hour, and also performs well in terms of average ATCO in ops costs, with costs being lower only in Finland. However, looking at non-operational staff specifically, the IAA ANSP has the second highest costs in the group.

4.12 ATCO in ops productivity is highlighted as a key driver for operating costs. Steer found that while productivity had increased slightly in RP1, this was reversed in RP2 resulting in a limited change in ATCO productivity overall. ATCO-hour productivity of the IAA ANSP is mid-ranking compared to the others in the comparator group. However, when Steer measured productivity based on ATCO in ops employment cost per composite flight hour, the IAA ANSP has the lowest cost per composite flight hour.

4.13 Non-staff costs increased over the RP1 and RP2 periods. The growth was generally constant across all areas of non-staff costs with the proportions in each year remaining relatively unchanged. The IAA ANSP's non-staff costs are the second highest in the comparator group relative to traffic.

2020 and 2021 Base 'Year'

4.14 Steer developed cost saving scenarios against which the cost containment measures put in place at the IAA ANSP over 2020 and 2021 could be compared. The IAA ANSP's actual costs for 2020 would entail a reduction of €9m on 2019, with €7m planned for 2021, including reductions driven by the employment wage subsidy scheme (EWSS) provided by the Irish government. The reduction in staff costs achieved by the ANSP in 2020 was primarily driven by a significant reduction in overtime and the EWSS scheme. Payroll costs were also significantly reduced from July to October, through reduced working hours and salary. Staff costs were reduced in a similar manner in 2021, with greater reductions in salary costs as pay decreases were applied across the full year.

4.15 Non-staff costs were reduced by 16.6% in 2020 compared to 2019, but the ANSP expects them to be 8.2% higher than 2019 in 2021. The reductions in 2020 were driven largely by decreases in training, administration, and travel costs. While training and travel costs are expected to continue to fall in 2021, the decrease in costs is, under the IAA ANSP submission, cancelled out by increases in administration and 'operational' costs.

4.16 Steer assessed the savings made and planned by other ANSPs, based on the submissions of December 2020 made in line with Regulation EU 2020/1627. Scenario A was developed on that basis. For this scenario, Steer have assessed that a greater reduction in staff costs would have been achievable. Steer implemented reductions to non-staff costs that would place the IAA ANSP just within in the top 25% of ANSPs in terms of savings, i.e. at the bottom of the upper quartile.

4.17 The implementation of this scenario would result in a decrease in operating costs of 10% in 2020 and 13.7% in 2021, compared to 2019. This compares to the IAA ANSP actual savings for 2020 of 9% and planned savings for 2021 of 7%.

4.18 Steer then examined cost reductions achieved by other companies in Ireland in response to COVID-19, including Dublin Airport, Ryanair, Aer Lingus, Irish Continental and Bank of Ireland. These companies were chosen from industries that also experienced significant reductions in their revenues due to Covid-19. The purpose of this scenario was to consider whether these companies, with greater exposure to volume risk compared to ANSPs, responded to the crisis with more substantial cost savings.

4.19 When comparing the reduction in operating costs relative to the fall in revenue for each of these companies, the IAA ANSP reported the smallest relative decrease in costs. The reduction achieved by the ANSP was 12%, while the other companies achieved reductions of between 27% and 85% relative to the fall in revenue. These reductions were accomplished through varying means by each organisation, but most reported decreased staff costs and headcount reductions, as well as considerable decreases in other operating costs.

4.20 Based on this analysis, Steer developed Scenario B, influenced by the level of savings achieved by airlines and airports and other companies. This has been done with consideration of the operational differences across these organisations. In this scenario there are larger assumed decreases in staff costs through increased uptake of

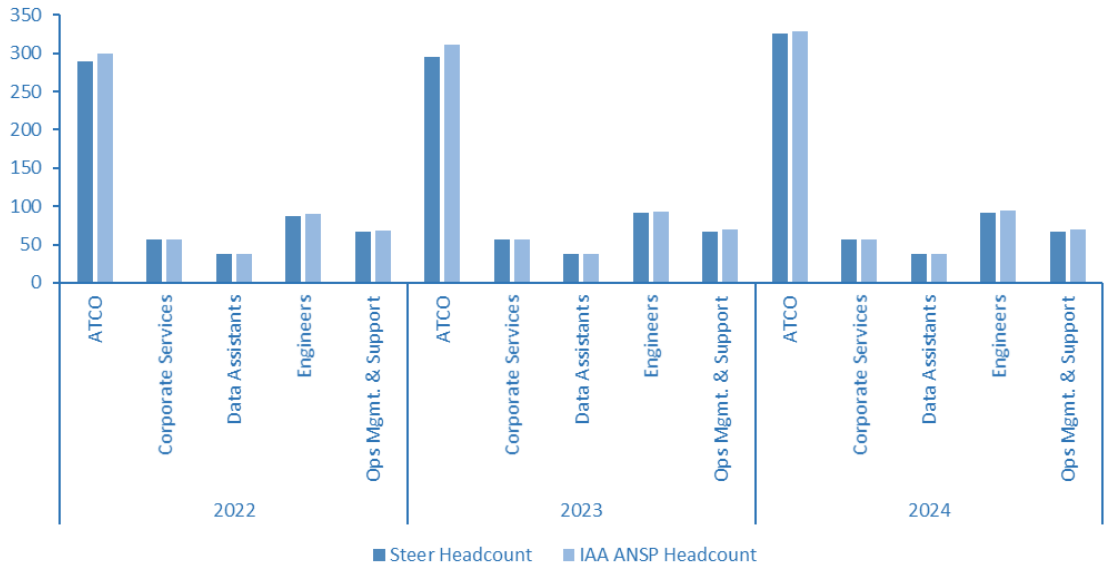
the voluntary severance scheme and the implementation of larger salary reductions across most staff. While these reductions are more substantial than the ANSP-driven scenario A, they remain below the savings achieved by most of the organisations listed in paragraph 4.18, in recognition of the more limited ability of ANSPs to scale their costs, particularly in the short term. The assumptions made in this Scenario B would result in reductions in operating costs of 11.4% in 2020 and 19.0% in 2021, compared to 2019 actual costs. This again compares to the IAA ANSP actual savings for 2020 of 9% and planned savings for 2021 of 7%.

Forecasting 2022-2024

4.21 Steer developed a bottom-up forecasting model for 2022 to 2024, and developed forecasting assumptions regarding efficient headcount, staff costs, and non-staff costs, which are outlined below.

4.22 Steer forecasts that ATCO productivity will remain constant for most of RP3, as it is expected that lower traffic levels will not result in a manifestation of any potential productivity improvements in 2022 and 2023. There is, however, a target set of 2% improvement in 2024 due to the expectation that traffic volumes will have recovered to a large extent at this point and all SESAR deployment programme projects will be completed by 2024.

Figure 4.2: IAA and Steer Headcount Forecast for 2022-2024



Source: Steer, IAA ANSP

4.23 The headcount required, as assessed by Steer, is relatively similar to the IAA ANSP's business plan as can be seen in Figure 4.2. The forecast ATCO requirements were modelled based on traffic levels, the level of staff required to ensure a safe service, and the number of staff required to deliver capital projects and to enable regulatory compliance. By 2024, this has resulted in a very similar level of resourcing to the ANSP's stated requirement, with a difference of only 3 ATCOs. The variance is somewhat higher in 2022 and 2023 as Steer considers that the surplus of available staffing hours should largely offset the requirements to staff new positions due to dual runway operations at Dublin Airport. The number of non-operational ATCOs is assumed to

remain constant throughout RP3.

4.24 A feature of the period 2022-2024 will be the commencement of dual runway operations at Dublin. However, the specific timing of this is uncertain, which leads to an issue for the development of this Performance Plan. That is, if we assume that dual operations commence in 2022 and they do not, there will be an element of Determined Costs which will not be required. On the other hand, it would not be reasonable to expect the IAA ANSP to provide services for which it is not being remunerated. Our preference would be to set a delivery-based trigger, similar to what CAR has implemented for Dublin Airport in relation to the runway itself,[6] however the regulation does not allow for this. There is a possibility to reopen the Performance Plan, in line with Regulation 2019/317, should the assumption we make on this point not materialise. Alternatively, it is possible that by September we may have more clarity on the timing, and we can also run further tests on the sensitivity of costs to the timing of this event, which will in itself be non-linear.

4.25 Steer accepts that an increase in engineers is required, as are additional costs associated with compliance with EU Regulation 373/2017, but does not fully accept the stated requirements in the IAA ANSP business plan. Steer assumes an increase of 4.5 engineers and 6.5 staff in operational management support associated with ensuring compliance with EU Regulation 373/2017. The new tower and runway related infrastructure will require an increase of 6 engineers, while the new En Route contingency centre (CEROC) will necessitate 2 additional engineers also. The remaining 6 additional engineers are needed to support other Capex projects.

4.26 The reduction in data assistants, by one, is in line with the IAA ANSP's business plan. Similarly, the reduction in corporate services staff remains as in the IAA ANSP business plan. There is a decrease of 8 corporate services staff from 2022 onwards which is due to the institutional separation of the IAA ANSP and IAA SRD, and the consequent smaller size of the new ANSP as compared to the existing IAA.

4.27 Steer forecasts that cost containment related salary reductions will be reversed for 2022 and further that salary costs will increase at CPI+1% per annum from 2022. This is based on historical Irish labour market trends. Thus, given inflation forecasts of approximately 2%, Steer's approach allows for a forecast 3% nominal annual increase. The resulting staff costs in 2022-2024, compared to the IAA ANSP proposals, can be seen in Figure 4.3.

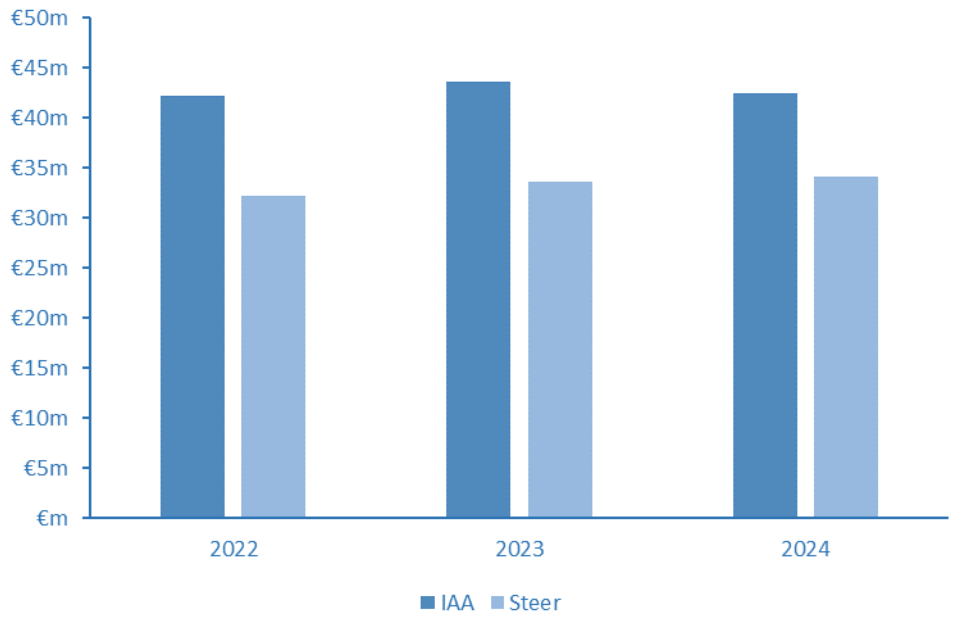
[6] See for further details: https://www.aviationreg.ie/_fileupload/Decision%20MASTERCOPY%202017-04-28.pdf

Figure 4.3: IAA ANSP and Steer Staff Costs Comparison, 2022-2024

Source: IAA ANSP Business Plan, Steer Model, 2017 prices

4.28 Other operating costs are less sensitive to changes in traffic. As such, in most cases, Steer did not consider that there was good reason to deviate from 2019 levels in real terms, which has led to a higher degree of variance with the IAA ANSP proposals as compared to staff costs. This assumption resulted in both reductions and increases in different line items.

Figure 4.4: Other Operating Costs, 2022-2024, Steer and IAA ANSP



Source: Steer, IAA ANSP Business Plan, 2017 prices

4.29 When calculating several of the cost lines included under administration and operational costs, an efficiency factor was applied based on Steer estimates of anticipated savings associated with capital projects during RP3. For several items included under operational costs, such as maintenance and spares, the costs were

adjusted based on the anticipated increase in the size of the asset base. The NSA's treatment of capital expenditure, in particular the quantum allowed for and the assumed asset lives as described in Section 6, has been inputted into these calculations. This was applied within the computing, operational maintenance, building repairs and security lines, as appropriate. A starting point for computing costs was calculated based on historical computing cost data that was provided by the IAA ANSP and the cost is forecast to increase by 5% annually in real terms. Finally, training costs are an output of the model, as they are based largely on the number of ATCOs required.

Table 4.3: Operating Costs in Steer Report and IAA ANSP Business Plan, €,000's

	IAA ANSP			Steer		
Cost Category	**2022**	**2023**	**2024**	**2022**	**2023**	**2024**
Staff Costs	€70,233	€72,907	€75,588	€67,388	€68,950	€70,844
Non-Staff Costs	€42,214	€43,546	€42,379	€32,200	€33,552	€34,186

Source: IAA ANSP Business Plan, Steer Report, 2017 Prices

Cost Allocation between En Route and Terminal Charging Zones

4.30 Costs have been allocated to En Route or Terminal as advised by Steer. For ATCO staff costs, forecast Terminal and En Route ATCO requirements are modelled separately by Steer and as such, there is no cross subsidisation. Dual runway operations at Dublin Airport will see a greater proportion of the costs associated with ATCOs shift to the terminal cost base from 2023, which can be seen in the allocations in Table 4.4.

4.31 Other staff costs continue to be allocated broadly in line with the IAA ANSP's allocation keys, which ultimately leads to a similar allocation as is applied to ATCOs as set out in Table 4.4. The IAA ANSP cost allocation methodology first separates costs into cost centres, based on the geographical location which the cost relates to. Following this, the costs are split into activities which may then be further divided into sub sections. Each of the activities and sub sections are assigned cost allocation keys based on the extent to which the activity is related to En Route or Terminal services.

4.32 The cost allocation keys for an activity are based on a number of factors, including traffic, the number of staff working and in which role, the use of assets, and the '20km rule'. The 20km rule is a practice that allocates all costs related to the first 20km from the airport to terminal cost base, with charges to En Route beginning from the 20km point. For some direct operating costs, such as rent, the costs are first divided into particular activities using a key before being assigned to a location and then allocated based on this.

Table 4.4: En Route Allocation of Staff and Other Operating Costs

	Item	2021	2022	2023	2024
Staff Costs	ATCO	87%	87%	86%	85%
	Corporate Services	83%	83%	83%	83%
	Data Analyst	88%	88%	88%	88%
	Operational Management Support	86%	86%	86%	86%
	Engineering	85%	85%	85%	85%
Non-Staff Costs		82%	82%	81%	81%

Source: Steer Report, IAA ANSP Business Plan. Percentages are of total in-scope costs, i.e. they exclude unregulated costs

4.33 We have not seen any evidence that this allocation methodology involves material cross-subsidisation in operating costs, either between the Terminal and En Route cost bases or with unregulated activities such as services provided in Shanwick oceanic airspace.

4.34 In order to ensure that only eligible operating costs are included in the regulated Terminal and En Route cost bases, the allocations are based on Steer's forecast for efficient operating costs within the regulated entity. This results in ineligible cost items being excluded from the Terminal and En Route cost bases, including costs associated with North Atlantic Communications (NAC) radio officers and all other costs related to NAC, and a consequent apportionment of engineering, other operational, and corporate services staff. This can be observed by comparing the published regulated entity accounts[7] with the published company accounts[8].

Proposed Decision

4.35 As outlined above, our proposed forecasts for 2022-2024 are based on our review of Steer's analysis for this period. Following consideration of Steer's report, as well as the IAA ANSP's business plan, we propose to implement Scenario A for 2020 and 2021.

4.36 There are three possible options we could implement for the 'base year' of 2020/2021:

- Costs as proposed by the IAA ANSP
- Scenario A
- Scenario B

4.37 As noted above, given the exceptional measures implemented for 2020 and 2021, the implication of our decision on this point flows through to the level of revenues to be recovered over the 5 to 7 year period from 2023. It does not impact the unit rates charged for last year or this year, but rather will impact the size of the gap between the Determined Costs and the regulated revenues actually earned in 2020 and 2021 – the gap which will be recovered from airspace users from 2023.

4.38 We note that the IAA ANSP has been able to fund this revenue gap in 2020/2021 through retained earnings accrued over RP1 and RP2. Given that our Determined Costs

[7] https://www.aviationreg.ie/_fileupload/20210616%20IAA%20Regulated%20Entity%20Financial%20Statement%202020.pdf

[8] https://www.iaa.ie/publications/docs/default-source/publications/corporate-publications/annual-reports/iaa-annual-report-2020-eng-final-spreads

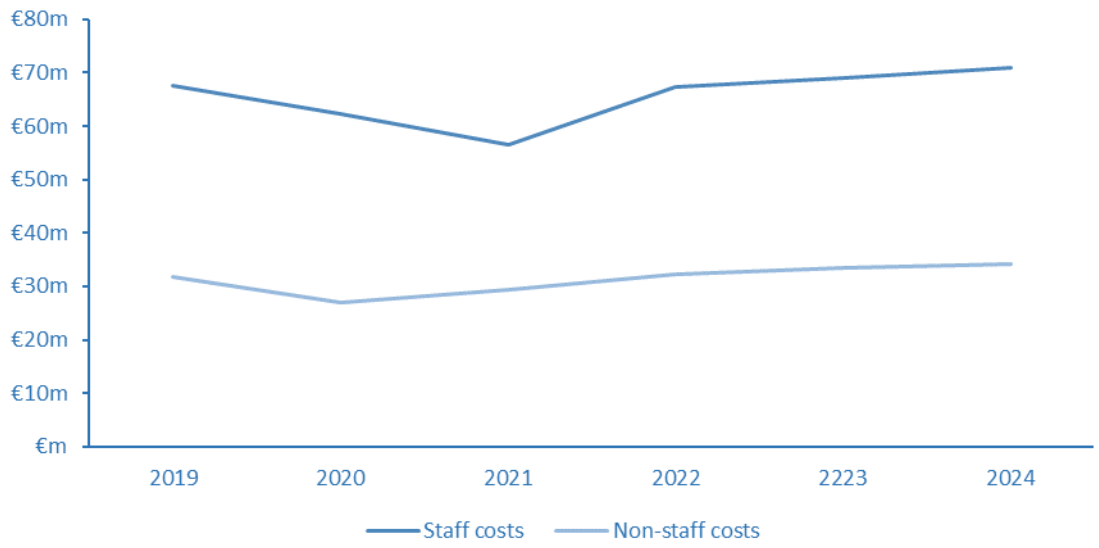
are forecast to allow the recovery of efficiently incurred expenditure to provide the required services, we do not anticipate that there is a need for this revenue in the way that there may be if the gap had been funded through debt. If the goal of economic regulation is to set charges which allow for the recovery of forecast required costs, but are no higher than that, this would weigh in favour of Scenario B.

4.39 However, it would not be appropriate to overlook the risk allocation methodology provided for under the regulation, which has benefitted airspace users in RP2. This is particularly true where most of the relevant costs have already been incurred or are committed. We also note that Reg 2020/1627 states that "*due account should be taken of the actual costs incurred by air navigation service providers and Member States*". There have been various interpretations of this statement posited, however, with the reference to taking due account of actual costs incurred by ANSPs, it would also appear to align more closely with Scenario A rather than Scenario B.

4.40 In April 2020, in response to a request from the IAA ANSP, we advised that if we are required to assess whether cost containment measures taken were sufficient, the question will be, did the IAA ANSP assess all costs, and take practical, achievable steps to control those where appropriate. In the context of the regulatory model in effect, uncertainty over the recovery trajectory, and the responses of other ANSPs, benchmarking the response of the IAA ANSP against the response of other ANSPs as opposed to volume-exposed companies is, in our view the best way to give effect to this commitment.

4.41 This has led to our proposal to adopt Scenario A for 2020 and 2021. The effect of this is that Determined Costs associated with 2020 are assessed at approximately €1m lower than actual costs. Then, for 2021, our proposal is c.€6m lower than the ANSP proposal as we expect that the ANSP should be able to maintain non-staff costs below the levels it has suggested for the remainder of 2021, and if it does not do so, this will have a marginal impact on the level of additional revenues it will earn from 2023. As described by Steer, achieving these reductions would have moved IAA ANSP towards the upper end of European ANSPs, without requiring a "best-in-class" level of savings, and for 2020 at least, is close to the level of savings actually achieved.

Figure 4.5: Staff and Non-Staff Costs, 2019-2024



Source: CAR, Steer, 2017 Prices

4.42 We have included Voluntary Severance Scheme (VSS) and Voluntary Early Retirement (VER) costs associated with these schemes as exceptional items. We intend to report these as restructuring costs as provided for under Article 2(18) of Regulation 317/2019.

4.43 Finally, it should be pointed out that while Steer have developed their forecasts on the basis of granular assumptions, this should not be taken to mean that the IAA ANSP is required to achieve the individual targets, such as in relation to assumed headcount or payroll costs, precisely as we set out, or in fact to achieve the Opex target at all. There are often different ways to achieve an outcome. We have sought to develop one scenario which we consider to be balanced and achievable, while posing a challenge from a cost control perspective, which then allows the IAA ANSP to develop its organisational structure as it sees fit, as the rest of the RP3 period unfolds.

4.44 However, to stress test our proposal in line with regulatory good practice, a downside scenario on Opex (i.e. where there is significant overspend on the allowances) is discussed in Section 11.

5. Cost of Capital

5.1 This section sets out our proposals on the allowed cost of capital for the IAA ANSP under the revised RP3 Performance Plan. The proposed decision on the cost of capital set out in this document considers both the Performance Review Body (PRB) guidance[9] (which we understand to be consistent with the Regulation EU 2019/317) and relevant regulatory precedent from CAR and other regulators.

5.2 The pre-tax weighted average cost of capital (WACC) is given by the following formula:

WACC (pre-tax) = g × Rd + 1/(1 – t) × Re × (1 – g);

where:

g = total debt/(total debt + total equity) or 'gearing';

Rd = pre-tax cost of debt;

Re = post-tax cost of equity;

t = corporate tax rate;

5.3 The estimation of each of these WACC components is set out in the remainder of this section. The corresponding WACC components proposed within the IAA ANSP's RP3 Business Plan are also set out below.

Gearing

5.4 The gearing used within the WACC represents the proportion of an entity's operations financed by debt (as opposed to equity) and can be set using its actual, or a notional, capital structure. The actual capital structure reflects the actual proportion of debt and equity used to finance operations, whereas the notional capital structure uses an 'optimal' gearing, which is intended to reflect an efficient proportion of debt and equity that could be deployed.

5.5 While the IAA ANSP currently has no debt, and its current gearing is therefore zero, it has put in place borrowing facilities for the remainder of RP3. However, the timing and extent to which these facilities will be used means the IAA ANSP's level of gearing throughout RP3 is uncertain. Notwithstanding the lack of clarity around the actual level of gearing in RP3, the preference within recent Irish regulatory decisions has been to use a notional gearing which represents an 'efficient' or 'optimal' level of gearing that minimises the WACC and the cost of capital. We therefore intend to use a notional gearing for the IAA ANSP.

5.6 There is no universally accepted precise level of gearing that is considered to be efficient or optimal; however, regulatory decisions within the Irish and European aviation sector in recent years have used values between 50% and 60%, and the PRB has also stated that the gearing associated with an efficient WACC should be around 60%. In its 2020 decision[10] on NATS En Route plc's (NERL) WACC, the UK Competition and Markets Authority (CMA) used a lower notional gearing of 30% as this was more in line with comparator airports and air navigation service providers (ANSPs) and

[9] Study on Cost of Capital Methodology review (August, 2019)
[10] NATS (En Route) Plc/CAA Regulatory Appeal (August, 2020)

would lead to a more efficient WACC for NERL.

5.7 We consider a gearing within the range of 40% and 60% appropriate and have used a mid-point estimate of 50%. This is line with the IAA ANSP's gearing assumption of 50%.

Cost of Equity

5.8 The cost of equity is estimated using the Capital Asset Pricing Model (CAPM), which is given by the following formula:

$Re = Rf + \beta_e \times (Rm - Rf)$:

where:

Re = Post-tax cost of equity;

Rf = Risk-free rate;

β_e *= Equity Beta; and*

Rm = Total market return (TMR).

Rm – Rf = Equity risk premium

5.9 The CAPM describes the expected return for assets and equities, and in cases where equities are traded in markets, some of the parameters are observable based on market data. However, in cases such as the IAA ANSP where equities are not traded, the parameters are estimated, as set out below.

5.10 The PRB has proposed that, due to the impact of COVID-19 on the aviation sector, the cost of equity for RP3 could be set to zero. However, we do not consider 0% to be appropriate as, firstly, the market conditions of 2020 and 2021 are projected to improve significantly in the remaining years of RP3 and, secondly, the cost of equity represents the level of return required by investors, which, based on the parameters of the CAPM set out below, is not 0% in the current environment. Thus, while the IAA ANSP is free to waive its return on equity if it were to choose to do so, we do not believe that there is a strong theoretical or legal basis for us to impose this as a regulatory remedy. However, we consider that the rationale for the proposal is relevant in relation to the aiming up allowance for 2020/2021, as discussed below.

Risk-free Rate

5.11 An appropriate range for the risk-free rate (which is the theoretical rate of return of an investment with zero risk) has been derived based on yields on 10-year Irish and German government bonds and considers market expectations on future government bond yields. This methodology in line with PRB recommendations and Irish regulatory precedent.

5.12 Irish and German 10-year bonds have been selected, respectively, as the state in which the IAA ANSP operates and the lowest risk bonds within the Euro area. To reflect a mix of current market conditions and longer-term trends, 1-year, 2-year and 5-year average yields have been used. Bond yields are currently at historically low levels and yields on both Irish and German 10-year bonds have decreased to below zero, in nominal terms, in recent years.

Table 5.1: Nominal 10-Year Bond Yields[11]

Country	5-Year Average	2-Year Average	1-Year Average
Ireland	0.5%	0.1%	(0.1%)
Germany	0.03%	(0.4%)	(0.5%)

Source: Investing.com

5.13 In order to generate real yields required for the WACC, nominal yields have been converted using the Fisher equation[12] and the European Central Bank's (ECB) survey[13] on the expected long-term inflation rate for the relevant time periods. The long-term expected inflation rate has remained between 1.7% and 1.9% over the last five years, which implies real yields have been well below -1% across Irish and German bonds.

Table 5.2: Real 10-Year Bond Yields

Country	5-Year Average	2-Year Average	1-Year Average	Mid-point
Ireland	(1.2%)	(1.6%)	(1.7%)	(1.5%)
Germany	(1.7%)	(2.1%)	(2.2%)	(1.9%)

Source: Investing.com & ECB

5.14 While the above rates reflect the current risk-free rate, they do not take account of yields or rates in future years or throughout the remainder of RP3. Forward rates, which reflect market expectations on future yields, are not directly observable though can be estimated using spot rates on bonds with shorter maturities.[14]

5.15 Forward rates have been estimated using the ECB's Euro area yield curve[15] for each remaining year in RP3 relative to December 2020 using both all Euro area government bonds and AAA-rated government bonds. The spread versus spot yields on AAA-rated Euro area[16] bonds is minimal, though the spread versus all Euro area[17] implies market expectations of increased yields in the next few years.

Table 5.3: Euro Area Bond Spreads versus December 2020

Year	Spread versus December 2020		
	All Euro area bonds	AAA-rated Euro area bonds	Average
2021	0.74%	0.10%	
2022	0.85%	0.08%	
2023	0.96%	0.06%	
2024	1.09%	0.02%	
2021-2024 average	**0.91%**	**0.06%**	**0.49%**

Source: ECB

5.16 Based on the mid-point of historic real yields and average forward rates for RP3, our estimate for an appropriate range for the risk-free rate is -1.5% to -1.0%. The upper bound of this range is in line with the -1.0% risk-free rate used by the IAA ANSP.

---

[11] Average of monthly rates where, 5-year average is 2016-2020, 2-year average is 2019-2020 and 1-year average is 2020.
[12] 1+ real yield at time t = (1+nominal yield at time t)/(1+long-term expected inflation rate at time t)
[13] ECB HCIP inflation forecast survey
[14] Forward Rate = $[(1+S1)^{n1}/(1+S2)^{n2}]^{1/(n1-n2)}$-1, where S=spot rate and n=number of years.
[15] ECB Euro area yield curves
[16] Euro area 10-year Government AAA-rated bonds (December 2020 average daily rate)
[17] Euro area 10-year Government Benchmark bond yield (December 2020 rate)

Table 5.4: Risk-free Rate Estimate

	Data Point	Lower Bound	Upper Bound
	Current yields	(1.9%)	(1.5%)
+	Forward rates	0.5%	0.5%
=	Risk-free rate	(1.5%)	(1.0%)

Source: CAR Calculations. Differences in totals due to rounding

5.17 This range sits within estimates of the risk-free rate with recent regulatory decisions within the aviation sector, including Dublin Airport[18] (-0.6% in 2019) and NERL[19] (-1.7% in 2019 and -2.25% in 2020).

Beta

5.18 Within the CAPM, the equity beta is a measure of an entity's volatility or sensitivity to systemic risk. In order to estimate the equity beta (or levered beta), the asset beta (or unlevered beta), which isolates the risk solely due to an entity's assets and removes the impact of debt, must first be estimated. The equity beta is then estimated using the asset beta by including impact of debt (by 'levering' the beta).

5.19 The equity beta is given by the following formula:

$$\beta_e = \beta_a \times [1+(1-t) \times (D/E)]$$

where:

β_e = *equity beta;*

β_a = *asset beta;*

t = corporate tax rate;

D = share of operations financed by debt (equivalent to g in the WACC formula); and

E = share of operations financed by equity (equivalent to (1 – g) in the WACC formula).

5.20 The above equity beta formula assumes the debt beta is zero, reflecting that fact there is no market risk associated with the IAA ANSP's debt. This is the approach most often used in the estimation of the cost of equity and regulatory decisions, which we do not see a reason to deviate from here.

5.21 To generate an asset beta, we have drawn upon recent regulatory decisions within the European aviation sector which have surveyed betas of a selection of European ANSPs and airports. In addition to the ANSPs (which are regulated under same regime as the IAA ANSP), the betas of the selected airports are considered to be good comparators as they incur similar levels of sector-specific demand and revenue risk to ANSPs, are mostly regulated under some form of price-cap regulation[20] and, for the market-based estimates, are of a sufficient size that equity is sufficiently liquid and therefore a more reliable benchmark for beta estimates.

5.22 We consider ANSPs and airports more appropriate comparators for the IAA ANSP than

[18] Maximum Level of Airport Charges at Dublin Airport 2020-2024 (October 2019)
[19] NATS (En Route) Plc/CAA Regulatory Appeal (August 2020)
[20] Except for Fraport, which calculates its WACC as part of its charges-setting process.

those proposed by the PRB[21], as they operate in a much more similar operating, competitive and regulatory environment. However, while there are similarities, it should be noted that there are some still important differences between ANSPs and airport's operational and regulatory environments which affect systemic risk exposure.

Table 5.5: European Aviation Sector Asset Betas

Estimate Type	Name	Entity Type	Year(s)	Asset beta
Based on market data	ADP	Airport, France	2016-2020	0.5-0.6
	Fraport	Airport, Germany	2016-2020	0.45-0.55
	AENA	Airport(s), Spain	2018-2020	0.55-0.65
	ENAV	ANSP, Italy	2019-2020	0.45-0.55
Regulatory Decision	Heathrow	Airport, UK	2019	0.5
	DAA	Airport, Ireland	2019	0.5
	NERL	ANSP, UK	2019	0.46
	NERL	ANSP, UK	2020	0.5-0.6

Source: UK CMA, CAR. Note: All market-based estimates are based on data up to February 2020 within the CMA's 2020 decision on NERL.

5.23 The betas for the airport and ANSPs shown above imply a narrow range of between 0.45 and 0.65. However, it should be noted that only the 2020 NERL estimate dates from after March 2020, and thus the impact of COVID-19.

5.24 While an event such as COVID-19, which has had a disproportionate negative impact on the aviation sector relative to other industries, could reveal airports or ANSPs to be more, or less, sensitive to systemic risk than had previously been assumed, such an event will not necessarily change these entities' sensitivity to systemic risk, especially over the long term (asset betas based on market data are typically measured for a period of up to five years).

5.25 While COVID-19 is clearly a significant negative shock, which has reduced demand and revenues within the aviation sector, it is not clear that this means ANSPs are any more sensitive to systemic risk than they were prior to COVID-19. As was the case prior to COVID-19, ANSPs under the SES charging scheme are permitted to charge airspace users at a level sufficient to cover their costs, including the revenue lost in 2020 and 2021 through revised performance plans (though 4.4% of revenue is at risk under the traffic risk sharing mechanism).

5.26 Therefore, we do not consider there is sufficient evidence to deviate significantly from the range of asset beta estimates from airports and ANSPs shown in the table above. It is likely that ANSPs under the SES are slightly less sensitive to systemic risk than comparable airports given the environment in which they operate; ANSPs are less exposed to revenue risk through SES regulation (particularly over the long-term), although this is somewhat offset by lower permitted operating margins (due to smaller asset bases relative to operating costs) and higher operating leverage, both of which increase sensitivity to systemic risk.

5.27 Based on its assessment of risk exposure and comparator analysis, the IAA ANSP has

[21] Lansdowne Oil & Gas and Ryanair Holdings.

used an asset beta range of between 0.65 and 0.70; however, this appears high based on the evidence above (and is higher than each of the aviation sector comparators within the IAA ANSP's report). On balance, we consider 0.45 to be 0.55 an appropriate range for the asset beta, which based on a gearing range of 50%, translates to an equity beta of between 0.84 and 1.03.

Equity Risk Premium

5.28 In order to estimate the equity risk premium (which is the excess return earned by investors above the risk-free rate), we have drawn upon datasets of historical market returns, in line with PRB guidance, and recent regulatory precedent. The equity risk premium can either be estimated in isolation or as part of total market returns (equivalent to the sum of the risk-free rate and the equity risk premium). Total market returns (TMR) is generally considered to be more stable over time, compared to its individual components, and therefore potentially better suited for estimating the equity risk premium (assuming the risk-free rate is known or has been estimated).

5.29 To generate an initial estimate of the equity risk premium, we have used the Damodaran datasets[22], a source of financial market data recommended by the PRB. Within the Damodaran risk premium datasets, the equity risk premium for each country is calculated using two alternative approaches; by using either rating-based sovereign bond default or credit default swap spreads, relative to appropriate benchmarks, and applying these to a mature equity market premium after accounting for relative market volatility. These approaches generate a range for the current Irish equity risk premium of between 4.9% and 6.2%.

5.30 Given the range of the risk-free rate of between -1.5% and -1.0%, this equity premium range implies a total market return (TMR) range of 3.4% to 5.2%. This range appears low and is somewhat below the level of the TMR used in recent Irish regulatory determinations; the TMR has been set at between 6.3% and 6.75% across a number of regulatory determinations in the aviation and utilities sectors in recent years. In addition, the 2019 Swiss Economics study[23] for the most recent Dublin Airport charges determination found that average Irish and European returns over the long-term have been between 6.1% and 6.8% (using Blume's method[24]), and that forward-looking TMRs have in recent years been between 6.1% and 6.3%.

5.31 We have therefore set the equity risk premium to be consistent with the long-term TMR estimated within recent regulatory decisions, such that the TMR is between 6% and 7%. The range for the equity risk premium is therefore 7.5% to 8.0%; this is in line with the IAA ANSP estimate which gives a range for the equity risk premium of between 7.4% and 7.8%, implying a TMR of between 6.4% and 6.8%.

5.32 Consistent with recent regulatory decisions, given the long-term stability of market returns, this range is also an appropriate estimate of the forward-looking equity risk premium, which can be used for the remainder of RP3.

---

[22] 'Risk Premiums for Other Markets' dataset
[23] Dublin Airport Cost of Capital for 2019 Determination (September 2019)
[24] Blume's method gives a weighted estimate of the arithmetic and geometric mean returns.

Cost of Debt

5.33 Generally, to estimate an entity's efficient cost of debt, an estimate of embedded debt (based on current debt costs) and new debt (based on current yields on bonds from comparable entities and market conditions) are combined to generate the total cost of debt. The PRB states that corporate debt costs of comparable entities should be used to estimate the cost of debt for ANSPs.

5.34 However, the IAA ANSP currently has no embedded debt and has included the terms of the agreed borrowing facilities within its RP3 Business Plan. The IAA ANSP's cost of debt can therefore be estimated directly based on these agreed facilities.

5.35 We have calculated the cost of embedded debt using the various fees and rates in the IAA ANSP's RCF arrangements. The range for the nominal cost of debt is in line with the 1.52% used by the IAA ANSP. Nominal debt costs have been converted to real debt costs using the Fisher equation[25] and an inflation rate of 1.4%, which is the RP3 average rate based on the April 2021 Eurostat figure for 2020 and the April 2021 IMF forecast for 2021 to 2024. This leads to a real cost of debt of 0.12%.

Aiming up

5.36 Consistent with recent Irish regulatory precedent and UKRN guidance[26], we have included an 'aiming up' allowance within the estimation of the WACC. This is to mitigate estimation error and the impact of the point estimate of the WACC being set too low – which is considered to have greater adverse consequences on economic welfare than an overestimate.

5.37 Though an overestimate of the WACC will lead to somewhat higher charges for airspace users, an underestimate could disincentivise investment, which is considered to have greater detrimental welfare impacts in the long term. Based on this, and consistent with the CAR 2019 decision on Dublin Airport[27], we have set an aiming up allowance of 0.5%.

5.38 However, this regulatory period is unusual in that we are already more than three quarters of the way through the 'base year', which itself comprises the first two years of a five-year period. In that context, as well as the impact of COVID-19 on the sector during 2020 and 2021 referenced by the PRB, the rationale for aiming up the WACC in these years falls away. For that reason, we do not propose to aim up the WACC for 2020 and 2021.

WACC Summary

5.39 The range of values for the WACC, calculated based on the parameters above, is shown in the table below compared against the values estimated by the IAA ANSP (the IAA ANSP's nominal cost of debt has been updated based on the updated RP3 inflation forecasts). The estimated range is below the point estimate for the real WACC within

[25] 1+ real cost of debt = (1+nominal cost of debt)/(1+ expected inflation rate)
[26] Estimating the cost of capital for implementation of price controls by UK Regulators (2018)
[27] Maximum Level of Airport Charges at Dublin Airport 2020-2024 (October 2019)

the IAA ANSP BP of 5.0%.

Table 5.6: IAA ANSP and NSA WACC Comparison

Parameter	IAA ANSP BP estimate		NSA estimate		
	Low	High	Low	High	Point estimate
Gearing	0.5	0.5	0.5	0.5	0.5
Risk-free rate	(1.0%)	(1.0%)	(1.5%)	(1.0%)	(1.2%)
Total market returns	6.4%	6.8%	6.0%	7.0%	6.5%
Equity risk premium	7.4%	7.8%	7.5%	8.0%	7.8%
Asset beta	0.65	0.70	0.45	0.55	0.5
Equity beta	1.22	1.31	0.84	1.03	0.94
Post-tax cost of equity	7.3%	9.1%	4.9%	7.2%	6.0%
Tax rate	12.5%	12.5%	12.5%	12.5%	12.5%
Pre-tax cost of equity	8.4%	10.5%	5.6%	8.3%	6.9%
Cost of debt	0.1%	0.1%	0.1%	0.1%	0.1%
Aiming up					0.5%*
Pre-tax real WACC	**4.6%**	**5.3%**	**2.8%**	**4.2%**	**4.0%**

*Source: NSA Calculations, IAA ANSP. *Aiming up applied for 2022-2024 only.*

5.40 The nominal WACC in each year of RP3 is shown in the table below. The point estimate of the real WACC from the table above has been converted to a nominal WACC, using the inflation rate for each year[28], to convert the real risk-free rate and real cost of debt to nominal values using the Fisher equation.

Table 5.7: Nominal WACC

Figure	2020	2021	2022	2023	2024
Inflation	(0.5%)	1.6%	1.9%	2.0%	2.0%
Nominal WACC	3%	5.2%	6.0%	6.1%	6.1%

Source: NSA Calculations

5.41 The IAA ANSP has kept its asset register at historical cost (i.e. in nominal prices). Consequently, the RAB we have derived from the asset register is nominal, and thus a nominal WACC must be applied to derive the return on capital.

[28] April 2021 Eurostat figure for 2020 and April 2021 IMF forecast for 2021 to 2024

6. Capital Costs and Investments

6.1 This section sets out our proposed IAA ANSP capital cost allowances for RP3, summarised in Table 6.1. There are two elements of Capital Costs:

- Depreciation charges which must be based on the value of the asset over its expected useful life.
- A return on capital, derived from the application of the WACC set out in Section 5 to the Regulated Asset Base (RAB).

Table 6.1: Proposed Capital Costs for RP3

Source	Allocation	Determined				
		2020	2021	2022	2023	2024
NSA Proposal	En Route	€7.5m	€10.1m	€11.4m	€12.2m	€11.4m
	Terminal	€2.9m	€4.3m	€9.1m	€10.3m	€10.3m
	Total	**€10.4m**	**€14.4m**	**€20.5m**	**€22.5m**	**€21.6m**
ANSP	En Route	€7.8m	€11.0m	€13.5m	€15.7m	€15.5m
	Terminal	€3.0m	€6.3m	€11.1m	€12.9m	€13.5m
	Total	**€10.8m**	**€17.3m**	**€24.6m**	**€28.6m**	**€28.9m**

Source: CAR Calculations, Nominal Prices

6.2 Below we set out how we arrived at these revised allowances for RP3. We then set out proposals in relation to the regulatory treatment and reporting for new RP3 projects. A project-by-project overview of new RP3 projects is contained in Appendix 1.

6.3 The RAB is in nominal prices. All figures presented in this section are therefore in nominal prices, with a nominal WACC applied as set out in Section 5. The inflation forecasts are thus not applied to these costs for our unit rate forecasts, and they will be excluded from inflation adjustments as per Article 26 of Regulation 317/2019.

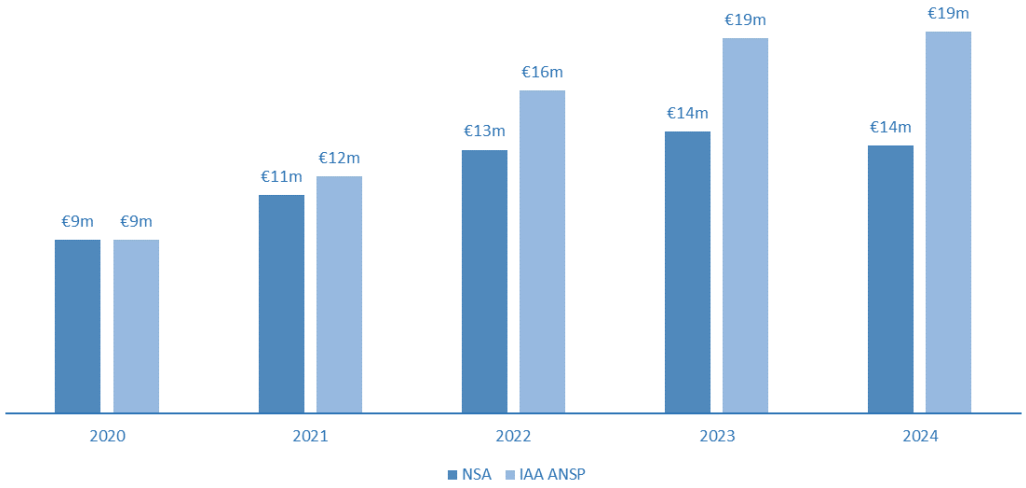
Capital Costs

Modelling of Depreciation and Return on Capital

6.4 As CAR was not involved in the original RP3 Performance Plan, it was necessary to build a model of the ANSP's full RAB from first principles. A condensed version of this model has been used for the ANSP Capex sheets in the published model; the new RP3 projects have been included individually in these sheets but the rollover asset base from RP2 has been included at total level.

6.5 We first sought to replicate the IAA ANSP's figures based on its assumptions regarding depreciation. Ultimately a close match was obtained with the figures provided in the IAA ANSP BP. Figure 6.1 shows our modelled depreciation charges, based on the ANSP proposal but with a number of adjustments to the assumptions for new RP3 projects, which are explained below. Note that, in this section and the financial model, we present the IAA ANSP proposals as we have modelled their input assumptions, rather than the figures in the BP.

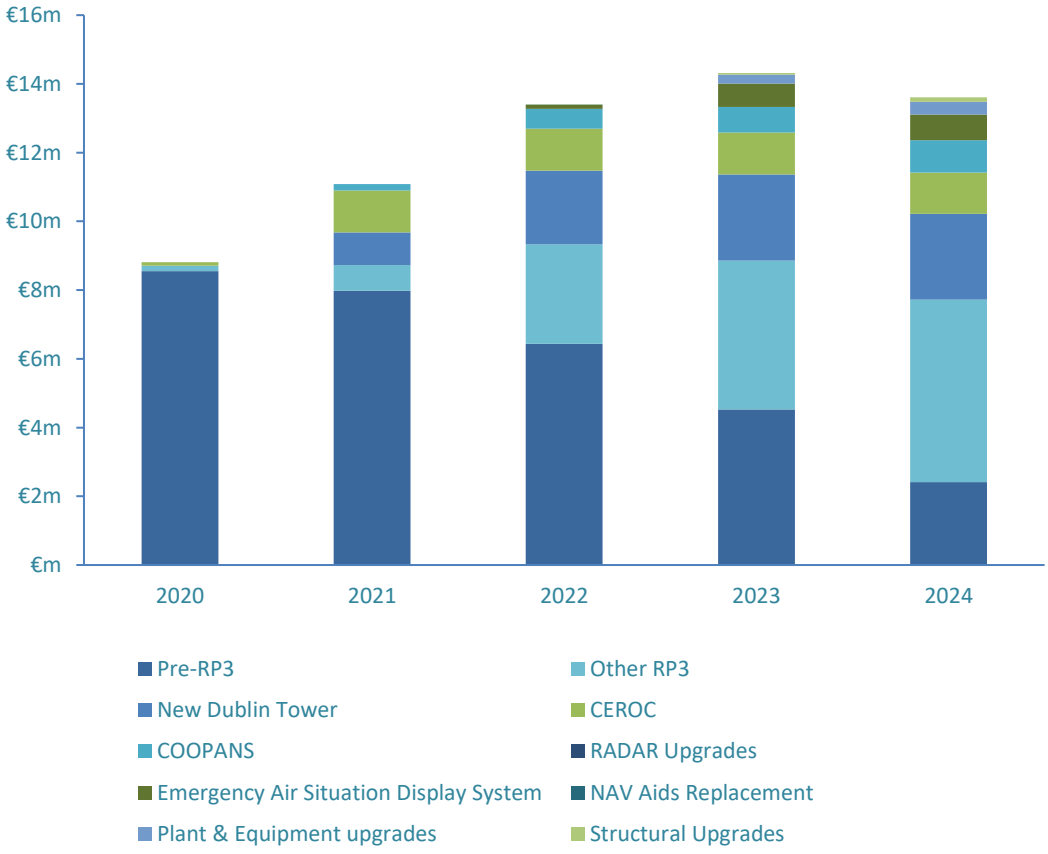
Figure 6.1: Proposed Depreciation Costs Over RP3, Compared to IAA ANSP



Source: CAR calculations

6.6 Figure 6.2 shows a breakdown of our proposed depreciation costs by project or group of projects.

Figure 6.2: Proposed Depreciation Costs by Major Project or Group

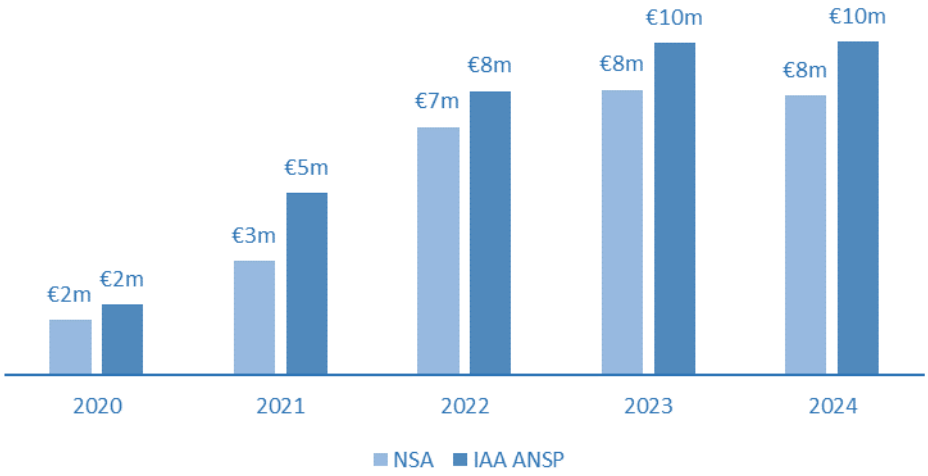


Source: CAR Calculations

6.7 Similarly, we sought to replicate the IAA ANSP's calculated return on capital. Again, a close match was obtained with the ANSP's calculations. Figure 6.3 shows these

calculations, compared to the NSA proposals for the allowed return on capital. The IAA ANSP figures are presented as we have modelled their input assumptions, rather than the figures in their BP submission. The nominal WACC in each year is applied the weighted average net book value (NBV) of fixed assets (where the weighting applies to when new assets are capitalised in the year) and added to accrued capitalised interest (described below).

Figure 6.3: Proposed Return on Capital over RP3, Compared to IAA ANSP



Source: CAR Calculations

6.8 Article 4(d)(i) of 317/2019 allows for charges calculated on the basis of '*the sum of the average net book value of fixed assets in operation or under construction*.' A feature of the IAA ANSP's recovery of capital costs over the last number of years is that it has only charged capital costs in relation to capitalised assets in operation. Thus, rather than charge a return on capital for assets which are under construction, this foregone revenue is instead capitalised and then depreciated alongside the value of the asset. This necessitates the calculation of a notional asset base, composed of both the value of the project and the value of the foregone interest during construction, to which the WACC is applied.

6.9 This is a timing of remuneration issue, being NPV neutral overall compared to charging a return in the same year(s) as when the asset is actually under construction. We do not see that the wording of the regulation precludes such an approach. Indeed, in the context of the 'User Pays' principle, there is an argument for the remuneration to be aligned with the useful life of the project. We have thus applied this approach in our modelling of the IAA ANSP's return on capital.

Cost Allocation

6.10 In building the IAA ANSP's RAB, we reviewed the cost allocation methodology through which the capital costs are assigned to the En Route, Terminal, and other cost bases. Costs are first allocated to geographical cost centres, such Shannon ACC (Ballycasey), Dublin Airport, Cork Airport, Shannon Airport, North Atlantic Communications (Ballygireen), and Headquarters. Then, where a project is solely associated with the provision of En Route services, such as at Ballycasey, it is allocated 100% to the En

Route cost base. If solely associated with the provision of terminal services, it is allocated 100% to the terminal cost base. If the project is anticipated to be used for the provision of both En Route and terminal services at a given location, it is jointly allocated. Thus, the new tower at Dublin Airport has been fully allocated to the terminal cost base, while the new contingency En Route centre (CEROC) has been fully allocated to the En Route cost base.

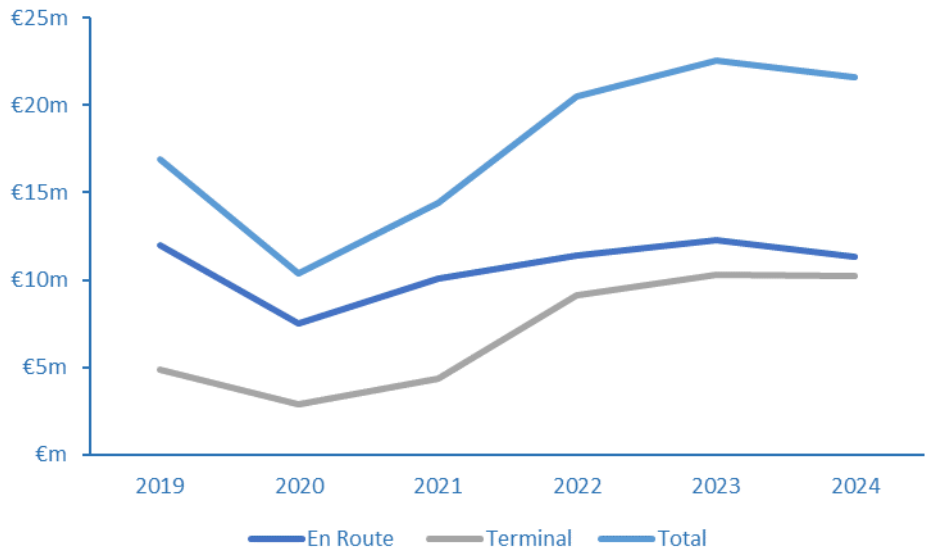
6.11 The En Route: Terminal apportionment of jointly allocated projects depends on the location. At Dublin and Shannon ATC centres, costs are allocated 75:25 to En Route, while at Cork the apportionment is 50:50. These allocation keys reflect the extent to which each cost centre provides services to terminal/En Route traffic, having regard to the 20km rule referenced in Section 4 and the mix of ACC, Approach, and Tower services provided by each ATC unit. We note that this allocation approach aligns with paragraph 2.5.4 of the CRCO guidance material on principles for establishing the cost base for En Route charges.[29]

6.12 Certain RP3 projects, such as Conditional Survey Works, encompass works at the Ballygireen centre. We have verified that these direct costs have not been apportioned to either the Terminal or En Route cost bases, and that supplementals such as contingency and escalation have also been apportioned based on the split of direct costs within the project.

6.13 We conclude that the IAA ANSP's allocation methodology for capital costs is reasonable and we do not propose to change it as part of this revision to the RP3 Performance Plan. The allocation of each RP3 project, as assigned to the relevant cost centre(s), can be observed in our financial model.

6.14 Figure 6.4 displays our proposed capital costs by charging zone for RP3, as well as 2019 actuals.

Figure 6.4: Proposed En Route, Terminal, and Total Capital Costs for RP3



Source: CAR Calculations

[29] https://www.eurocontrol.int/sites/default/files/2019-12/doc-20.60.01-eurocontrol-principles-january-2020-en.pdf

New RP3 Investments

6.15 The IAA ANSP has proposed a revised capital investment programme for RP3 as part of the revision of the overall Performance Plan. As requested by the NSA, the IAA ANSP has included summary business cases for each project of material value in the appendices to its revised Business Plan. We consider projects with a value below the €5m threshold referenced in Regulation 317/2019 to be material for the purposes of setting charges and consequently address such projects at an individual level also. Furthermore, exempting projects below a threshold from scrutiny or analysis as part of a consultation process can, in future, lead to an incentive to tactically split projects into smaller constituent parts.

6.16 A feature of the first two years of RP3 is the capitalisation of two 'big ticket' projects, a contingency En Route ACC (CEROC) as back-up to the main Ballycasey centre, and a new control tower at Dublin Airport, which is required to provide air traffic services for the new runway currently under construction. These projects commenced during RP2; CEROC was capitalised in late 2020, while most elements of the tower works are expected to be capitalised later this year. Between them, these projects account for almost half of the value that the IAA ANSP expects to capitalise during RP3, leading to a significant step change by 2022 in the size of the ANSP's RAB and the level of capital remuneration flowing from it.

6.17 The IAA ANSP has split the capital programme into three categories:

- Appendix 1, Property and Security Projects. The types of works envisioned in these projects are structural refurbishments and alterations, M&E and plant refurbishments/replacements, and a small minority of new build works.

- Appendix 2, ICT projects. These projects include cybersecurity and life-cycle replacement for PCs, laptops, ICT servers, and printers.

- Appendix 3. This appendix is further divided into four categories, namely:

    - IP Network and security projects.
    - Flight Data Processing and Communications projects, including replacement of the Emergency Air Situation Display System (EASDS), replacement of Voice Communications Systems (VCS), and replacement of the Navaids (ILS and IRVR) at Dublin, Cork, and Shannon airports.
    - COOPANS projects.[30]
    - Surveillance/Mechanical and Engineering. This category includes the new Dublin Airport tower, the CEROC, and the replacement of Radar 2 at Dublin Airport and the delivery of a second off-site radar.

6.18 These appendices are published in the IAA ANSP's Business Plan submission. We issued a range of questions and requests for information to the IAA ANSP, most of which

[30] COOPANS is a partnership between the IAA ANSP and four other ANSPs, as well as the ATM systems supplier, Thales, for the incremental delivery of ATM systems and functionality in a coordinated manner. For more details, see: https://www.coopans.com/

focused on ensuring we understood and could report on:

- The need for, or benefits of, a particular project, and the nature of these benefits (i.e. whether they are anticipated to bring benefit at local and/or network level, or are indirectly related to performance such as building maintenance works).

- How the cost proposal has been derived and the robustness of same.

- The basis of estimation of asset lives.

Need for the Projects and Level of Investment

6.19 In most cases, as set out in Appendix 1, we accept the merits of progressing the intended projects during RP3, in the interests of effective and efficient service delivery. For some projects, while we understand the merits of the project, the need to progress it immediately, in the circumstances created by the pandemic, is less clear.

6.20 The Dublin tower and CEROC are major one-off infrastructure projects, with no projects of that nature included over the rest of RP3. Leaving aside the tower and CEROC, the ANSP is proposing a substantial step change in capital expenditure relative to the level incurred during RP2, such that it would approximately double.

6.21 In RP2, the IAA ANSP significantly underspent the Determined Cost levels. In reviewing the various condition reports and other evidence provided, we conclude that this was partly a result of not undertaking expenditure which was likely warranted, and thus there is an element of catch-up in the proposed programme. We consider that the ANSP has made a strong case that the level of investment in the business should increase relative to RP2.

6.22 As a top-down benchmarking exercise, we also calculated the IAA ANSP's asset base to operating costs ratio, and compared this to other ANSPs, in 2019. This was based on the December 2020 submissions. The IAA ANSP's asset base in 2019 is notably smaller than other ANSPs, both in general and within the benchmarking group specified in Article 6 of Commission Implementing Decision 2021/891. This may be partly a feature of relatively short asset lives discussed above, and care must be exercised in interpreting such a result to mean that the IAA ANSP needs to increase the size of its RAB, but this is again indicative that the IAA ANSP has invested relatively less than other ANSPs.[31] We carried out the same calculation based on projections for 2024, and while the gap is narrowed, the IAA ANSP would still be anticipated to have a relatively small asset base.

6.23 On the other hand, we are not convinced that the scale of the proposed increase is likely to materialise or is fully warranted during RP3.

Cost Estimates

6.24 Many of these projects and associated costings were developed some time ago. Given that CAR was only assigned the role of NSA in 2020 and the requirement to develop a

[31] For example, it may instead be the case that other ANSPs are incurring expenditure inefficiently, and local circumstances such as the timing of investments may also have a significant impact on this metric.

revised RP3 plan only crystallised in late 2020, there was no time to, for example, develop an agreed approach to costing projects for submission to the NSA. Consequently, the level of cost detail available for the projects was varied:

- Costings for the property and security projects have been developed by a Quantity Surveyor and align with the level of detail we would expect for projects at this phase of delivery, with the projects not yet having reached detailed design phase.

- As we are already significantly advanced through RP3, for some projects the cost proposal is based on outturns and/or contracted amounts. The Dublin tower and CEROC projects come under this category.

- Certain projects are effectively off-the-shelf systems and are costed on that basis.

- For some projects, little cost detail was available. In some cases, this is a feature of the phase of project development; for example, the COOPANS builds for the latter part of RP3 have not yet been defined.

6.25 In a number of cases, we identified that cost proposals did not appear to fully align with the supporting material provided, and/or certain costing assumptions are higher than we would expect. These are identified in Appendix 1, but are relatively minor in the context of the overall quantum of planned investment.

Asset Lives

6.26 Article 22(1) of Regulation 317/2019 requires that assets are depreciated over their '*expected operating life'*. This is an important principle in economic regulation, which ensures that the costs of a project are cross-temporally allocated fairly across airspace users who will benefit from the project.

6.27 In many cases, particularly the Appendix 2 and 3 projects, the asset lives proposed by the IAA ANSP are reasonable. In some cases, particularly the Appendix 1 projects and the major construction projects in Appendix 3, the proposed asset lives are shorter than we would expect, while one Appendix 1 project is longer than we would expect. In particular, a 20-year assumption for the construction elements of a major operational asset such as CEROC or the Dublin tower does not, in our view, reflect a reasonable centreline estimate of the expected operating life of these assets. For example, the Ballycasey ACC was assigned a 20-year asset life in 2003, thus is due to become life expired during RP3, but it is only now undergoing first significant maintenance works and is expected to continue in operation for the foreseeable future and to continue to provide value to airspace users.

Proposed Decision on NSA Adjustments to the RP3 Programme

6.28 While we broadly accept the merits of the proposed programme and the associated level of expenditure:

- We consider that, at a programme level, the efficient level of expenditure to deliver the full set of projects is likely somewhat lower than the cost submissions provided by the ANSP. We are unable to fully quantify this at a project level, given that in some cases cost detail is limited and/or projects are at early stages of design.

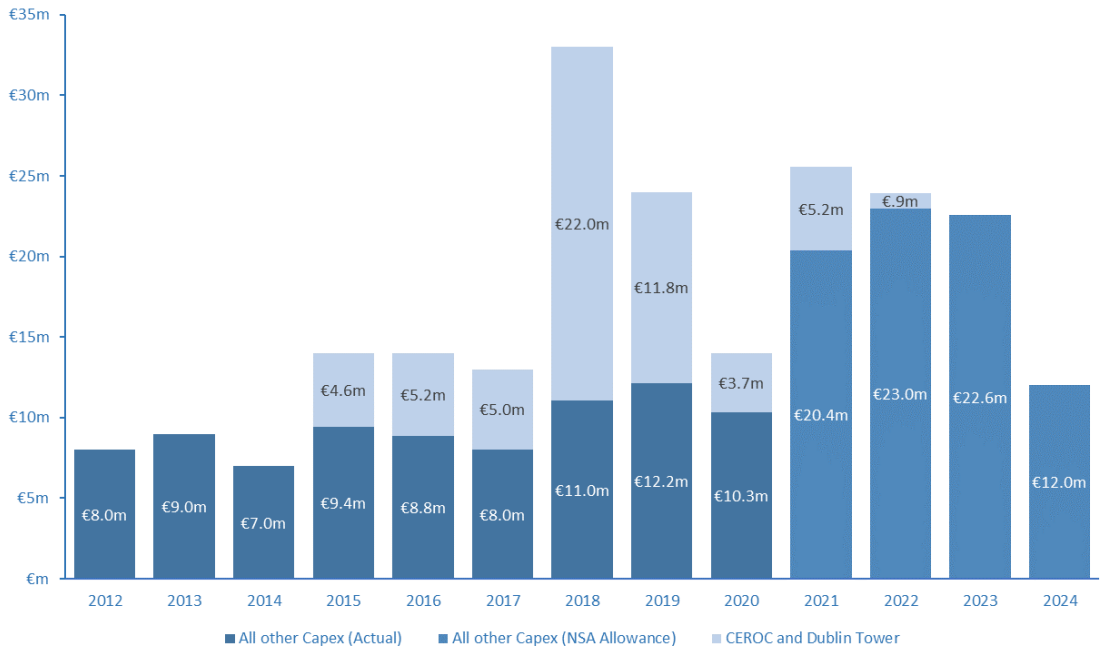
- We consider it unlikely that the IAA ANSP will deliver all of the projects within the timeframe proposed.

6.29 Therefore, rather than disallowing any individual projects or adjusting costings at a project level, we propose to make a programme level adjustment, over 2021-2024, to reflect these points. In our view, this adjustment should be set such that it still allows for a higher level of investment than the outturn levels over 2015-2020. On that basis, taking all of the above into account, we consider that a 20% reduction in forecast capitalisations, relative to the IAA ANSP proposal, is reasonable. This level of allowed expenditure is, in our view, more likely to reflect the actual level of expenditure during RP3 relative to what the IAA ANSP has proposed.

6.30 However, we propose to exclude expenditure associated with the Dublin tower, which is expected to be capitalised this year, from the adjustment. This is largely expenditure which has already been incurred, on an outlier project, and over which there is a high level of cost certainty. Thus, tower related expenditure has been included in full, as have 2020 actual capitalisations, which includes CEROC.

6.31 Figure 6.5 demonstrates our proposed decision translated to allowances for new capital expenditure, relative to the historic trends. Applying the 20% capitalisations reduction to the level of capital expenditure forecast by the IAA ANSP over 2021-2024 means that it is reduced from €99m to €84m.

Figure 6.5: Actual and Anticipated Capital Expenditure, 2012 to 2024



Source: IAA ANSP, CAR Calculations

6.32 Finally, for the reasons set out above, we propose to adjust the assumed asset lives in relation to a number of RP3 projects. The individual adjustments are noted and listed in Appendix 1 and can be observed (and adjusted to test sensitivities) in the financial model.

Reporting and Reconciliation of Actual Expenditure

6.33 In its Business Plan submission, the IAA ANSP has proposed that the RP3 allowances be reconciled at a programme rather than project (or grouping of projects) level. As our primary concern relates to under-delivery rather than overspend, we propose to accept this suggestion. This will provide flexibility for the ANSP to adjust the programme and continue to prioritise within it over the rest of RP3.[32]

6.34 We will however monitor and report actual efficient expenditure at a project level. If we require users to begin paying for these projects in RP3, we expect the IAA ANSP to deliver most of the projects set out in in the investment programme, with the associated benefits for airspace users and other stakeholders. Given that we have adjusted the scale of the programme, it would not be appropriate to develop a Red/Amber/Green (RAG) chart on the basis of the timelines set out by the ANSP; this would not be consistent with our position, reflected in the Determined Costs, that all of the projects are unlikely to be delivered to these timelines. We intend to develop a reporting template with the IAA ANSP later this year or on adoption of the Performance Plan, for publication on our website, focusing on what projects have been delivered or are progressing, material changes, and how expenditure is tracking against the Performance Plan assumptions.

6.35 We intend to adjust for outturn expenditure on an RP+1 basis.[33] Should the IAA ANSP underspend the allowance, this will be clawed back in RP4. Should the IAA ANSP deliver more of the programme than we anticipate during RP3, and efficiently incur associated expenditure in excess of what we have allowed for, this can be adjusted for in the unit rate for RP4 (subject to a cap of 5% of total RP3 Determined Cost capitalisations in the Performance Plan). Alternatively, these costs could be considered for inclusion into the RAB from the start of RP4.

[32] Provided that any changes which add, cancel or replace 'major investments' are notified to the NSA, subject to consultation, and approved by the NSA within the period as is required by Article 22(4) of Regulation 317/2019.
[33] See Article 22(4)(b) of Regulation 317/2019

7. MET, NSA, other State and Eurocontrol Costs

7.1 This section sets out proposed RP3 Determined Costs associated with Met Eireann Aviation Services Division (ASD), the NSA, and other State costs including Eurocontrol costs. Submissions from MET ASD and the NSA, as well as reviews by Steer of both cost proposals, are published alongside this document.

MET Eireann Aviation Services Division (ASD)

7.2 The Aviation Services Division (ASD) is a business unit of Met Éireann, Ireland's National Meteorological Service, which is maintained by the State under the UN Convention of the World Meteorological Organisation (WMO). The ASD is designated as Ireland's Meteorological Authority under the ICAO Chicago Convention on International Civil Aviation and since 2006 has been designated as a meteorological Air Navigation Service Provider (MET ANSP) under the EU Single European Skies Service Provision Regulation (**CIR EU 550/2004**) and therefore has responsibility for the provision of regulated meteorological services to aviation. Regulatory compliance and oversight of the ASD is maintained by the NSA.

7.3 The ASD states in its business plan that it ensures the non-discriminatory availability of weather data for bona fide aviation users in Ireland, including the provision of access to the UK World Area Forecast Centre products.

7.4 The aeronautical meteorological services provided by ASD include but are not limited to; the maintenance of the Meteorological Watch Office for the Shannon Flight Information Region (FIR), and the provision of aeronautical forecast and warnings services and maintenance of 5 Aeronautical Meteorological Stations.

7.5 The NSA provided a guidance note to MET ASD in March of 2021 in relation to developing a revised RP3 Business Plan. A first draft of the Business Plan was received by the NSA at the end of April, and following discussions, clarifications, and requests for some further information, a final version was received in June 2021. The final version is published alongside this consultation document.

MET ASD Costs

7.6 While the COVID 19 pandemic has significantly impacted on the aviation sector, its effect on meteorological service requirements to aviation has been limited, as these services are not generally sensitive to traffic levels. There was therefore relatively little scope for MET ASD to achieve cost savings from the reduced traffic levels. Despite this, the MET ASD Determined Costs for the RP3 period are expected to be significantly reduced relative to actual costs in RP2 and MET ASD expect to significantly outperform the union wide cost efficiency targets for RP3. Relative to 2019 actuals, it plans to reduce the total cost allocated to ANS, by between 22% and 29% in total in each year of RP3.[34]

[34]A note on the cost information contained in this subsection; all MET operating costs are given in 2017 prices as these are subject to inflation adjustments in the unit rates, however, the depreciation costs and capital expenditure are historical costs, which will therefore not be subject to inflation, in line with Article 22 and 26 of Reg 317/2019. Similarly, as set out below, supervision and other state costs are in nominal prices.

7.7 This decline in costs will result from both a proposed 25% reduction in staff costs over the period compared to 2019 levels, and from a reduction in non-staff costs by an average of 28% compared to 2019 levels. During this period there will be some increases in depreciation costs related to systems upgrades. However, some of these system upgrades are then expected to facilitate those reductions in staff costs later in RP3.

7.8 Key to the reduction in non-staff costs attributed to aviation is the expansion in the responsibilities of Met Éireann, due to the implementation of the Flood Forecasting Centre (FFC) from 2022. As a result of the new responsibilities, the coefficients allocating operating and capital costs to aviation will be reduced as the FFC will also be required to contribute to the Met's core infrastructure and services. The net effect of this will be to reduce the Core costs allocated to aviation by 18% from 2022 onwards.

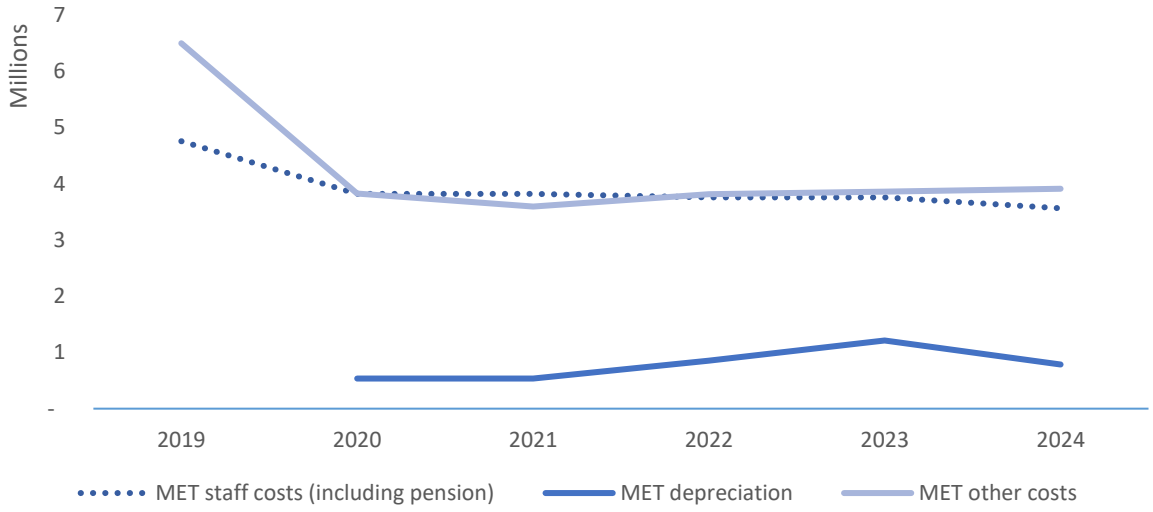
Table 7.1: MET ASD Projected Staffing Levels by Staff Category

Staff Category	2019	2020	2021	2022	2023	2024
Management	6	6	6	6	6	6
Operations supervisors	7	7	6	6	6	6
Technical/ICT support	6	6	6	6	6	6
Aviation forecasters	8	8	8	8	8	8
Development	2	2	2	2	2	2
Aviation weather observers	22	22	22	22	22	19
Clerical support	1	1	1	1	1	1
Total	**52**	**52**	**51**	**51**	**51**	**48**

Source: MET ASD

7.9 While MET plans to achieve cost savings through the reduction in staffing levels (due largely to efficiency improvements resulting from the introduction of the Aviation Modernisation and Modernisation Project), these reductions are not expected to occur until late in RP3, and until this point staffing levels will remain broadly flat. As MET salaries are driven by the Public Spending Code, staffing numbers are the main avenue (within the control of MET) through which staff cost savings can be found.

Figure 7.1: MET Staff Costs, Other Operating Costs, and Depreciation for Each Year of RP3



*Source: MET ASD, CAR Calculations. Note that we have included E*UMETSAT costs, which is a core cost listed in the ASD submission as an exceptional item, in Other Operating costs for the purposes of this graph.

7.10 Both MET staff costs and MET other costs are expected to drop significantly between 2019 and 2020 before flattening out across RP3. Depreciation costs on the other hand will increase steadily from 2021 to 2023 before declining slightly to 2024. The increase between 2021 and 2023 is due to the RADAR Upgrade and IMaMS projects reaching completion, while the decrease between 2023 and 2024 is due to a reduction in depreciation attributed to the AMAP project.

Capital Expenditure and Depreciation Costs

7.11 Table 7.2 summarises the proposed MET ASD capital costs.

Table 7.2: Overview of MET Capital Projects and Depreciation for RP3

Project	Project cost	Asset Life (yrs)	Depreciation total costs (2020-24)	Delivery year	Core / Direct
AMAP	€13m	8	€1.9m	2021	Core
RADAR Upgrade	€17m	25	€0.06m	2021 and 2024	Core
Auto Climate network	n/a	n/a	Nil	2022	Nil
METCOM	€1.2m	5	€0.31m	2021	Both, with €0.25m allocated to direct
AUTOMETAR	€0.5m	8	From RP4	2024	Direct
IMaMS	€5.4m	5	€0.88m	2021	Core
HPC	€6.7m	5	€0.72m	2022	Core

Source: MET ASD, Nominal Prices

7.12 A number of capital investment projects are planned for the coming years in the context of the SES and ICAO regulatory frameworks and with the intention of

developing scientific capacity and improved quality of service. While some of the capital projects are focussed specifically on supporting aeronautical meteorological functions, others are cross cutting with planned investments intended to also support other Met Éireann activities along with the aviation function.

7.13 The allocation of capital costs to aviation on foot of these projects is via the application of a cost allocation methodology which allocates the cost of these projects between aviation and other MET activities. The allocation key used is the direct cost of aviation forecasting divided by the direct cost of all forecasting activity. This coefficient was calculated as 33% for 2020/21 and 27% for 2022, 2023, and 2024 (with this reduction coming as a result of the expansion of MET Éireann's remit as outlined above).

Table 7.3: Total Core and Direct Costs 2020-24

Cost category	Core	Direct
Staff Costs	-	€18.7m
Other Operating Costs	€7.3m	€4.6m
Depreciation Costs	€3.6m	€0.3m
Total	**€10.9m**	**€23.6m**

Source: Met ASD, CAR Calculations, Nominal Prices

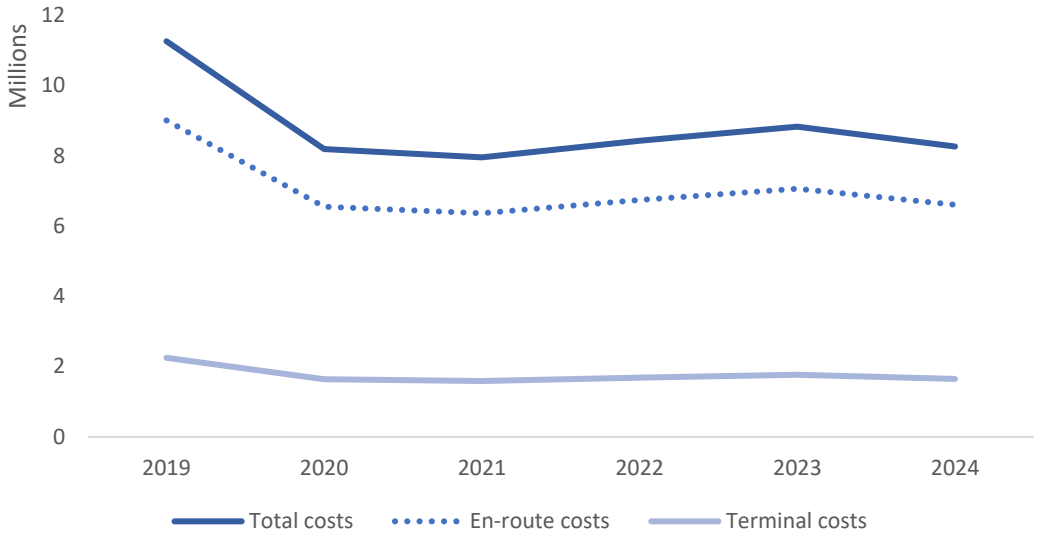
7.14 Table 7.3 shows the breakdown between total core and direct costs for the years 2020 to 2024, with core functions accounting for a third of all MET aviation costs and direct accounting for two thirds.

Charges to Aviation and Allocation

7.15 Met Éireann's accounting system calculates charges to aviation. Prior to the calculation of En Route and terminal costs, the system strips out the costs of service to general aviation, the military and other non-applicable costs.

7.16 Since a recommendation by CAR in 2002, these charges have been split 80:20 between En Route and terminal air navigation services, respectively. We consider that any deviation from this would require an assessment of the use of various MET services by organisations operating or providing services within the different charging zones. On the grounds of the time available to us and proportionality we do not propose to carry out such a review as part of this revision to the RP3 Performance Plan. It should be noted that the 2002 decision was intended to be time-limited and consequently there may be merit in reviewing these allocation keys ahead of the RP4 Performance Plan to assess whether they remain fit-for-purpose.

Figure 7.2: Proposed MET Total, En Route, and Terminal Costs for RP3



Source: MET ASD, CAR Calculations

MET - Conclusion

7.17 Considering the above analysis, the NSA is satisfied that MET ASD's cost proposals are reflective of enhanced cost efficiency in service delivery, and that it has included only eligible costs. Steer similarly advises that, given the level of cost savings proposed, well in excess of the union wide target, further detailed scrutiny of the cost proposal is not warranted. The NSA therefore proposes to reflect these costs in the Performance Plan.

7.18 In assessing the submission from MET ASD, we noted that the actual 2019 costs provided were considerably higher than the costs previously reported in the tables as actual costs for 2019 (€11.3m as compared to €8.3m). We concluded that the previously reported actual costs were the costs actually **charged** as opposed to costs actually incurred by ASD. That is, MET's determined costs which it recovered for 2019 were €8.3m, whereas its actual costs were €11.3m. This is likely to also have been the case for other years of RP2, however we have only investigated it for 2019 given the relevance of 2019 actual costs for comparing the Performance Plan against the En Route DUC target. For this reason, we intend to set out a baseline adjustment in relation to MET staff costs and for MET other operating costs, such that the correct figure for MET actual costs for 2019 of €11.3m is used as the baseline.

NSA

7.19 As described in Section 2, the role of NSA is currently carried out by two separate entities which are due to merge later this year to form the new IAA. An overview of each directly allocated function in the NSA, including the economics section currently in CAR, is below.

The first five constitute the Air Navigation Services Division (ANSD) within IAA SRD:

- **Communications, Navigation and Surveillance Systems for Air Traffic Management (CNS/ATM)**. The CNS is the team primarily responsible for the supervision and regulation of engineering procedures, cybersecurity, system

software, ILS installations and numerous other communications, navigation, and surveillance systems.

- **Air Traffic Services (ATS)**. The ATS team has responsibility for the supervision and regulation of air traffic control procedures, licensing and training of ATS personnel, performance-based communication (PBC) operations, fatigue management, and numerous additional air traffic services.

- **Procedures for Air Navigation Services & Aircraft Operation (PANS-OPS).** The PANS-OPS team has responsibility for the supervision and regulation of standard instrument departures (SIDs), instrument approach procedures (IAPs), standard terminal arrival routes (STARs), aeronautical data quality (ADQ), and numerous additional procedures.

- **Search and Rescue (SAR).** The National Search and Rescue plan 2019 requires the NSA to establish, implement and maintain a regulatory framework and oversight programme appropriate to the scale and complexity of the National SAR requirement for civil aviation. The new oversight obligations will include communications procedures and systems, agreements and protocols with adjacent and external SAR services; the aviation rescue coordination centre (ARCC) and sub centre, and other resources which can be used to conduct aviation SAR operations.

- **Economic Regulation.** The economic regulation team are currently operating within the CAR but are expected to transfer over to the new IAA before the end of 2021 as part of the organisational restructuring described above. This team has responsibility for several economic functions, including the determination of the maximum level of airport charges at Dublin Airport, oversight of the implementation of the EU Slot Regulation 95/93, and the setting and monitoring of cost efficiency targets for air navigation services in Ireland under the Single European Sky.

7.20 The legal basis for including these costs is set out in article 22(1)(a) of regulation 317/2019. The NSA's actual invoiced costs for a given year are adjusted for in the unit rates on an n+2 basis, as set out in Article 28 of Regulation 317/2019. These costs are not adjusted for inflation and are therefore included here in nominal terms.

NSA Costs

7.21 The NSA submission shows that it has estimated that its costs for RP3 will be higher than in RP2. This is due in part to the fact that previously reported supervision costs did not reflect the full costs of the oversight as they did not take account of corporate services such as IT, Finance and HR services. In previous years, some of these costs were not disaggregated within the IAA and thus were not reported as supervision costs. These costs now need to be reported as supervision costs due to the upcoming separation of the ANSP from the IAA and the subsequent merger of the IAA SRD with CAR.

7.22 The higher RP3 costs are also due to expected increases in staff costs resulting from increases in staffing levels in certain units, and increases in other operating costs. Some

of these increases are related to the changed institutional arrangements, while others, such as the new SAR officer positions, are related to other drivers.

7.23 Increases in the NSA cost figures are offset by reductions in the corporate services staff levels assumed for the ANSP, given the anticipated smaller size of the newly incorporated ANSP.

7.24 The NSA cost submission was developed by the finance teams in IAA SRD and CAR, while it has been assessed by the Economic Regulation team in CAR along with the other cost submissions. Our approach to assessing these costs was aligned to the approach Steer has taken to the ANSP operating cost forecasts, using cost data provided by the NSA. The results are set out in Table 7.4.

Table 7.4: Overview of Proposed NSA Costs, 2020-2024

Cost type	2020	2021	2022	2023	2024
Staff	€1.86m	€3.00m	€3.37m	€3.83m	€3.81m
Of which is pension	€0.31m	€0.5m	€0.58m	€0.66m	€0.66m
Other Opex	€0.93m	€2.24m	€1.82m	€1.82m	€2.01m
Depreciation	€0.02m	€0.02m	€0.29m	€0.29m	€0.29m
Total NSA Costs	**€2.81m**	**€5.26m**	**€5.47m**	**€5.94m**	**€6.11m**

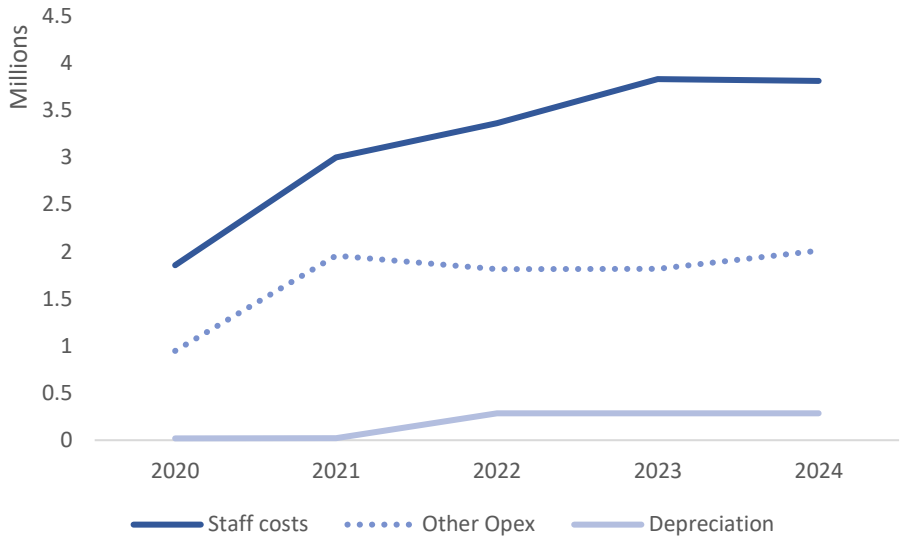
Source: IAA SRD, CAR Calculations, Nominal Prices

7.25 We have asked Steer to review these cost proposals outlined below. Steer concluded that the underpinning assumptions are appropriate and consistent with Steer's approach to developing the IAA ANSP cost forecasts. It made two recommendations, firstly identifying an indexation error, and secondly that the step change in administrative costs in 2021 should be explained.

7.26 We have corrected the indexation error. We note that 2020 and 2021 are considered transition years, as the new regulator is being established in this period. The costs for these years are lower than for 2022-2024, due to COVID-19 related cost saving measures in the IAA and the fact that CAR charged no costs to ANS in 2020, its first year as an NSA. The 2020 reported costs are intended to be based on actual costs within the IAA.

7.27 The 2021 costs are based on amounts separately budgeted for by CAR and SRD, rather than a combined NSA plan. Steer's comment in relation to administrative costs is noted; as stated by Steer, in September we intend to consider year-to-date actuals for 2021 against the budgets, to assess whether this budgeted increase has materialised, and if so, what the drivers are and how this reconciles with the regulated entity accounts.

Figure 7.3: NSA Total Staff Costs, Pension Costs, Other Operating Costs, and Depreciation Across RP3



Source: IAA, CAR Calculations, nominal prices

7.28 For 2022 to 2024, when the transition phase is complete, the following forecasts have been developed for the NSA within the new regulator. It should be noted that, as an entity which has not yet been established, there is a higher degree of uncertainty over these costs relative to what would ordinarily be the case for a regulator as opposed to a commercial entity.

7.29 Overall, as identified by Steer, the forecasts are approximately €1m lower in 2022 and €0.5m lower in each of 2023 and 2024, relative to the more granularly calculated figures in the NSA submission.

Staff Costs

7.30 The staffing and staff cost forecasts outlined below were developed based on individual staff level payroll costs. There are five relevant positions within the NSA which will not be filled until within 2022.[35] These include two SAR officers (this is a newly assigned role for RP3), and one addition in the CNS/ATM, ATS, and PANS-Ops teams. These positions have been included in standardisation plans submitted to EASA to address resource findings. Regulations (EU) 2017/373 and 2015/340 require the NSA to have a sufficient number of personnel, including inspectors, to perform its tasks and discharge its responsibilities.

7.31 Therefore, the current forecasts assume that on average these staff costs will start to be incurred halfway through 2022. Full costs are then included for 2023-2024.

[35] The NSA submission document identifies six positions, however one of these is currently in the process of being filled during 2021.

Table 7.5: NSA Headcounts, Allocations, and Staff Costs from 2022

NSA section	Headcount	Allocation to NSA	2022	2023	2024
SAR	2	100%	€0.19m	€0.38m	€0.38m
CNS/ATM	4	100%	€0.55m	€0.63m	€0.63m
ATS	6	100%	€0.84m	€0.93m	€0.93m
PANS-OPS	5	100%	€0.59m	€0.68m	€0.7m
ANSD Management & Support	4	100%	€0.45m	€0.45m	€0.45m
Economics	5	30%	€0.2m	€0.2m	€0.15m
Corporate Services & Central	25	17%	€0.56m	€0.57m	€0.58m
Total NSA	**27**		**€3.4m**	**€3.8m**	**€3.8m**

Source: NSA, CAR Calculations, Nominal Prices

7.32 Table 7.5 gives an overview of estimated IAA staffing levels for 2022-2024, and the staff costs which are therefore allocated to the NSA. Staff costs have been allocated to the NSA as follows: 100% of IAA ANSD staff costs will be assigned to the NSA as these staff roles are wholly related to air navigation. 30% of the economic regulation staff costs will be assigned to the NSA, as ANS oversight is only one of the three main functions of the economics section. These FTEs, 21 in total, are considered directly allocated staff.

7.33 Then, Corporate Services & Central staff costs are apportioned to the NSA, based on the planned FTEs directly allocated to the NSA divided by total operational FTEs in the new regulator. This gives an allocation key of 17%.

7.34 Costs associated with staff carrying out other operational functions such as licencing, aerodrome safety and security, airworthiness, and air passenger rights, have not been apportioned to the NSA.

Other Operating Costs

Table 7.6: NSA Forecast Costs for 2022-2024

Cost item	2022	2023	2024
Travel	€0.18m	€0.18m	€0.19m
Training	€0.03m	€0.04m	€0.04m
Utilities	€0.01m	€0.01m	€0.01m
Operating Costs	€0.04m	€0.04m	€0.04m
Administration	€0.78m	€0.8m	€0.81m
Corporate Services	€0.16m	€0.16m	€0.17m
Regulatory Software OPEX	€0.22m	€0.18m	€0.18m
Economic Consultancy	€0.1m	€0.1m	€0.25m
ICT Department OPEX	€0.29m	€0.3m	€0.33m
Total	**€1.8m**	**€1.8m**	**€2m**

Source: IAA, CAR Calculations, Nominal Prices

7.35 Table 7.6 above gives an overview of forecast operating costs for 2022-2024. The Regulatory Software Opex, and the ICT Opex are based on the regulator's central forecasts, of which 17% is allocated to the NSA, in line with the aforementioned allocation key. Economic consultancy costs for ANS are expected to be low for 2022-

2023, before increasing for 2024 in expectation of required support for the development of the RP4 Performance Plan.

7.36 For all other costs, 2022 to 2024 is equal to the 2019 costs allocated to ANSD, but adjusted for forecast inflation, with the exception of several small additions to account for the inclusion of CAR staff in the new organisation (e.g. travel and training). This is consistent with the approach which Steer has taken for the ANSP forecasts, as outlined above.

7.37 Additionally, due to economies of scale resulting from the CAR/SRD merger, other CAR overheads are also forecast to be subsumed within the IAA cost base.

Depreciation

7.38 Table 7.7 gives an overview of proposed NSA depreciation costs for 2022-2024. It also includes total project costs and estimated asset lives for the two projects. The first of these is a capital project to provide for ICT infrastructure for the new regulator. The IAA has also undertaken a major digitalisation project to provide a digitalised platform for all functions of the new aviation regulator.

Table 7.7: NSA Proposed Depreciation Costs, 2022-2024

Project title	Total Cost	Asset Life	2022	2023	2024
New Regulator ICT Infrastructure Costs	€2.9m	6	€0.48m	€0.48m	€0.48m
New Digital Online Regulatory System	€10m	8	€1.3m	€1.3m	€1.3m
Total			**€1.7m**	**€1.7m**	**€1.7m**
Total NSA (17%)			***€0.29m***	***€0.29m***	***€0.29m***

Source: NSA, CAR Calculations, Nominal Prices

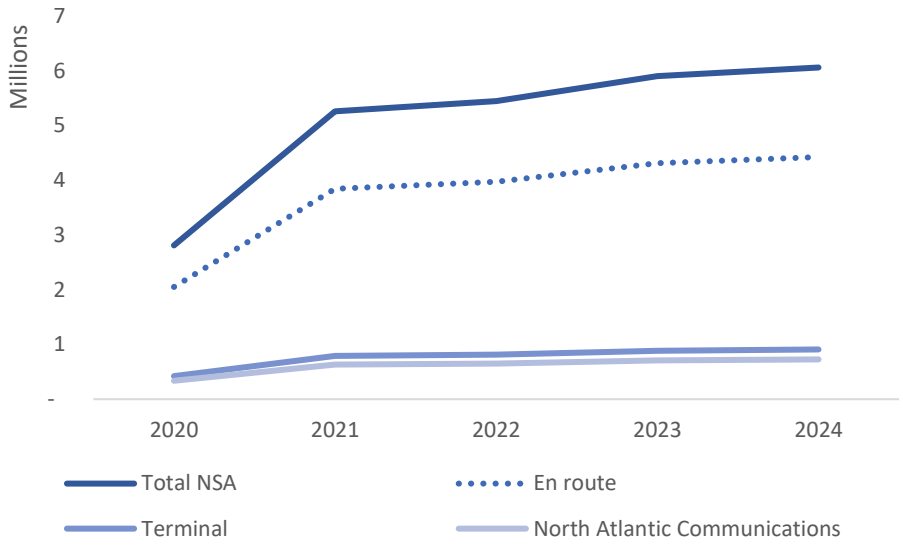
7.39 The 17% allocation key is again applied, leading to a depreciation charge of just under €0.3m per year. The NSA does not propose to charge a return on capital.

Allocation of NSA Costs

7.40 The costs outlined above are proposed to be distributed between En Route (73%), Terminal (15%), and North Atlantic Communications (12%) for RP3. Thus, 12% of the NSA costs listed above are allocated outside the scope of the Performance Plan and should be collected separately.

7.41 Given the separation and merger process, this allocation differs from RP2 where costs were allocated as 65% En Route, 13% Terminal, 11% North Atlantic Communications, and 11% SRD. The NSA does not propose to reassess the current allocation in full as part of this revision but proposes to maintain the ENR, TER, and NAC proportionate allocations, given that the SRD allocation must now be subsumed within these.

Figure 7.4: Proposed NSA total, En Route, Terminal, and NAC Costs for RP3



Source: IAA, CAR Calculations, Nominal Prices

Other State Costs (including Eurocontrol costs)

7.42 The legal basis for including these costs is set out in article 22(1) of regulation 317/2019, as described in paragraph 7.20 above. Like NSA costs, they are not subject to cost risk sharing. The state bodies' actual costs are thus adjusted for in the unit rates on n+2 basis. These costs are not adjusted for inflation and are therefore included here in nominal terms.

7.43 Table 7.8 below provides an overview of the costs. The figures are presented as they have been received from these organisations. The NSA does not propose to change the allocation of these costs' relative to the original RP3 plan; they will continue to be allocated 100% to the En Route cost base.

Table 7.8: Overview of Costs Resulting from the Policies of Aviation Organisations

Organisation	2020	2021	2022	2023	2024
Department of Transport	€2.7m	€2.8m	€2.76m	€2.85m	€2.9m
ICAO	€0.51m	€0.51m	€0.52m	€0.55m	€0.55m
ECAC	€0.04m	€0.04m	€0.04m	€0.04m	€0.05m
Eurocontrol	€7.15m	€7.54m	€7.54m	€7.56m	€7.67m
TOTAL	**€10.4m**	**€10.9m**	**€10.9**	**€11m**	**€11.2m**

Source: Eurocontrol, Department of Transport, CAR Calculations, Nominal Prices

8. Safety KPA

8.1 Safety targets have been chosen to promote the effectiveness of safety management (EoSM). During RP3, the NSA intends to mandate that the IAA ANSP comply with the Union-wide targets by achieving Effectiveness of Safety standards that are at least "Level D" in the objective of safety risk management and at least "Level C" in the other safety objectives of culture, policy, promotion, and assurance. These standards will ensure consistency between local and Union-wide targets (2019/903 Article 2).

8.2 Effectiveness of Safety Management (EoSM) targets are measured as follows:[36]

- Level A which is defined as 'Initiating' - processes are usually ad hoc and chaotic.
- Level B which is defined as 'Planning/Initial Implementation' - activities, processes and services are managed.
- Level C which is defined as 'Implementing' - defined and standard processes are used for managing.
- Level D which is defined as 'Managing & Measuring' - objectives are used to manage processes and performance is measured.
- Level E which is defined as 'Continuous Improvement' - continuous improvement of processes and process performance.

Union-Wide Targets

8.3 The union-wide targets for the safety KPA are shown in the table below; these are unchanged from the original union-wide targets set in 2019. The Union-Wide EoSM targets are not further disaggregated between Member States, instead applying uniformly.

Table 8.1: Safety KPA- Target EoSM Levels

Safety management objective	2020	2021	2022	2023	2024
Safety policy and objectives	C	C	C	C	C
Safety risk management	D	D	D	D	D
Safety assurance	C	C	C	C	C
Safety promotion	C	C	C	C	C
Safety culture	C	C	C	C	C

Source: Commission Implementing Decision *(EU) 2019/903 & Commission Implementing Decision (EU) 2021/891*

Irish Targets

8.4 Consistent with the provisions of Commission Implementing Decision (EU) 2021/891, the NSA intends to mandate that the IAA ANSP shall comply with the Union-wide targets during RP3 by ensuring EoSM that is at least "Level D" in the objective of safety risk management and at least "Level C" in the other safety objectives of culture, policy

[36] https://www.eurocontrol.int/prudata/dashboard/metadata/effectiveness-of-safety-management/

and objectives, promotion and assurance.

Table 8.2: Proposed Irish Targets for RP3, and Actual Performance for 2020

Safety management objective	2020		2021	2022	2023	2024
	Target	Actual	Target	Target	Target	Target
Safety policy and objectives	C	C	C	C	C	C
Safety risk management	D	C	D	D	D	D
Safety assurance	C	D	C	C	C	C
Safety promotion	C	C	C	C	C	C
Safety culture	C	D	C	C	C	C

8.5 To assess the compliance of the IAA ANSP with the required level of safety performance as defined by the union-wide targets, the NSA will oversee the IAA ANSP in order to provide assurance of the effectiveness of the level of safety management. This oversight will include, inter alia, audits, inspections, reviews of safety performance data and reviews of changes to the functional system.

8.6 The NSA will continue to conduct an annual review of the EoSM questionnaire, based on actual outcomes each year, and impose remedial measures in any areas of non-compliance. This review has been completed for 2020. The actual performance of the IAA ANSP was assessed at Level C for Safety Policy and Objectives, Safety Risk Management, and Safety Promotion, and assessed at Level D for Safety Assurance and Safety Culture. This means that it outperformed the targets for Safety Assurance and Safety Culture but did not comply with the target for Safety Risk Management due to compliance delay with Regulation (EU) 373/2017. Remedial measures have now been put in place.

Other Safety Measures and Monitoring

8.7 In its published RP3 Business Plan, the IAA ANSP has set out a detailed description of its safety management processes, safety culture, and measures it plans to undertake in RP3 in order to ensure compliance with the required level of safety performance.

8.8 The NSA also monitors a range of Safety Performance Indicators (SPIs), including the rate of Runway Incursions and Separation Minima Infringements. For the defined SPIs, there are associated safety targets and alert thresholds to provide quantifiable measures for the maintenance and/or improvement of the level of safety for the air navigation services domain in Ireland. This methodology is developed to identify an Acceptable Level of Safety Performance (ALoSP) and is aligned with ICAO Doc 9859.

9. Environment KPA

9.1 Environmental performance is a primary element of the SES performance scheme. The targets in RP3 aim to continue to improve performance with the goal of reducing fuel burn, flight time and CO_2 emissions.

9.2 The Environment KPA includes one Key Performance Indicator, which is the average horizontal En Route flight efficiency of the actual trajectory of aircraft (KEA).[37] This measures the average additional distance flown compared to the great circle distance, which is the shortest distance between two points on the surface of a sphere. Thus, it is intended to measure unnecessary additional distance flown, which is wasteful from an environmental perspective.

9.3 It is expressed as a percentage of additional distance relative to the great circle distance, so a relatively low percentage indicates relatively good performance and vice versa.

Union-Wide Targets

9.4 The original and revised union-wide environment KPA targets are shown in Table 9.1 below. The lower KEA targets in 2021 and 2022 reflect the anticipated lower levels of traffic (relative to original RP3 forecasts) and thus the ANSPs' potential ability to offer more efficient routes. The targets in 2023 and 2024 remain unchanged, reflecting the fact that traffic is projected to return closer to the original RP3 forecast levels in 2023 and 2024.

Table 9.1: Environment KPA Union-Wide Targets

Horizontal flight efficiency (KEA)	2020	2021	2022	2023	2024
Original targets	2.53%	2.47%	2.40%	2.40%	2.40%
Revised targets	2.53%	2.37%	2.37%	2.40%	2.40%
Percentage Reduction in target	-	4%	1.25%	0	0

Source: Commission Implementing Decision (EU) 2019/903 & Commission Implementing Decision (EU) 2021/891

Irish Targets

9.5 National KEA targets, or reference values, for each state, are calculated by the Network Manager, in order to meet the KEA target at an EU level.[38] The original and revised Irish KEA targets for RP3 are shown in the table below. For context, the actual performance of the IAA ANSP in 2019, the last year of 'normal' activity, was 1.24%. The NSA proposes to adopt these national reference values as the revised KEA targets for RP3.

[37] Where the En Route phase is considered to exclude 40 nautical miles around the airport of arrival and departure.
[38] For details on the methodology, see: https://ansperformance.eu/methodology/horizontal-flight-efficiency-pi/

Table 9.2: IAA ANSP Targets, and Actual Performance for 2020

Horizontal flight efficiency (KEA)	2020		2021	2022	2023	2024
	Target	Actual	Target	Target	Target	Target
Original targets	1.56%	1.11%	1.54%	1.53%	1.53%	1.53%
Revised targets	1.56%	-	1.13%	1.13%	1.13%	1.13%
Percentage Reduction in target	-	-	26%	26%	26%	26%

Source: Ireland October 2019 Performance Plan & NM advice on the revision of performance targets

9.6 Based on the above, we make the following observations:

- The KEA performance of the IAA ANSP is significantly better than the EU-wide average, with targets that are consequently more stretching than average.

- The revised EU-wide targets provide for slight improvements in performance in 2021 and 2022 relative to the original targets, while the targets for 2023 and 2024 are unchanged, as traffic is anticipated to return closer to 2019 levels. By contrast, the revised national reference values for Ireland are 26% lower than the original reference values across each year 2021-2024. Thus, the IAA ANSP is now being asked to contribute to EU-wide KEA performance to a relatively greater extent than was the case with the original RP3 targets and reference values.

- The revised national reference values are significantly lower than the IAA ANSP's actual performance in 2019. Consequently, implementing the revised reference values as our targets would change the nature of the challenge from one of broadly maintaining 2019 performance (with even some room for diminished performance), to one of attaining improved performance over 2022-2024. The exceptional situation of reduced traffic and changes in traffic profiles observed in 2020/2021, is not forecast to persist over the remaining years of RP3.

9.7 Free Route Airspace (FRA) was introduced in Ireland in 2009, which has been a significant driver of the relatively strong KEA performance. Further improvements in Ireland's KEA are significantly dependent on the introduction of FRA in neighbouring Flight Information Regions (FIRs) together with the accompanying system upgrades to enable full cross border FRA. The UK is planning to introduce FRA on a phased basis from December 2021, which will eventually lead to improved horizontal flight efficiency and KEA. Another factor which may impact KEA performance is the decisions of airspace users to fly sub-optimal trajectories.

9.8 Thus, there are significant factors largely outside the control of the IAA ANSP which may limit its ability to attain the proposed targets. However, sustainably reducing the environmental impact of aviation is a key goal for Ireland, as it is across the EU. A challenging target will drive a focus for both ANSP and NSA to continuously assess and monitor performance. From that perspective, it is preferable to have a target which, while challenging, seeks to drive performance improvements.

9.9 We therefore propose to implement the national reference values as the IAA ANSP's revised targets. As set out in Section 13, and having regard to the above factors, we do not propose to implement a financial incentive scheme in relation to the Environment KPA at this time.

Other Environmental Performance Metrics and Monitoring

9.10 The IAA ANSP is carrying out a review of areas of the Shannon FIR, the purpose of which is to facilitate Continuous Climb and Continuous Descent Operations (CCO/CDO) to and from airports and simplify airspace design where possible, in order to realise further improvements in flight efficiency and environmental performance. A revised airspace design structure is planned to be published in December 2021. The NSA will continue to monitor the implementation of these initiatives and strive to ensure sufficient measures are taken to seek to meet the performance targets.

9.11 In relation to additional taxi-out time and additional time in terminal airspace, the NSA will hold regular meetings with the ANSP at Dublin Airport to review data on these metrics and discuss any ATM factors that may impact performance.

9.12 It should be noted, however, that the main driver of increased taxi-out times over RP2 was increasingly constrained airfield infrastructure in the context of a sharp increase in traffic.[39] This was particularly the case when wind conditions precluded the use of the crosswind runway for dual runway operations during the peak first wave of morning departures. Additional taxi-out time has fallen significantly in RP3 to date, due to the reduction in traffic.

9.13 The additional time in terminal airspace is generally attributable to the flights following the Point Merge legs in part or in full, which is in turn driven by the capacity of the current single main runway to accommodate the level of arriving traffic. However, the Point Merge has been demonstrated to have considerable benefits to airspace users in reduced fuel consumption and to the environment in lowering carbon dioxide emissions, and maximising runway throughput compared to vertical holding due to the infrastructural constraints.[40] These benefits outweigh any negative impact on this metric.

9.14 As discussed above, a second parallel runway and associated taxiway infrastructure is currently under construction at Dublin Airport, and is expected to be operational during RP3. As stated by the IAA ANSP in its business plan submission, this will improve taxi-out performance in the context of the forecast traffic recovery, and should also translate into an improvement in the additional time in terminal airspace metric.

[39] CAR is the body responsible for declaring the slot capacity parameters at Dublin Airport. For further details on Dublin Airport capacity, see our decisions on this page:
https://www.aviationreg.ie/slot-allocationschedules-facilitation/documents-slots.244.html
[40] For further details, see:
https://www.iaa.ie/air-traffic-management/innovation/dublin-point-merge

10. Capacity KPA

10.1 The objective of the capacity key performance area is to achieve capacity levels that closely match with demand. Currently, given the lower traffic levels, this involves ensuring that adequate capacity is provided, and that, as traffic recovers, the ANSPs meet the increased demand with limited delays.

10.2 There are two KPIs within the KPA of capacity, one relating to En Route capacity and one relating to terminal capacity:

- The average En Route ATFM delay minutes per flight attributable to air navigation services.

- The average arrival ATFM delay minutes per flight attributable to terminal and airport air navigation services.

10.3 These targets are both expressed as delay minutes per flight, so a relatively low number indicates relatively better performance and vice versa. There are incentive schemes associated with both targets, which are discussed in Section 13.

En Route Capacity

10.4 Conceptually, when additional capacity is required, the airspace is divided into smaller volumes known as sectors. Each sector requires a specific number of air traffic controllers to provide the air traffic service. Additionally, each sector can be further divided, with the corresponding number of additional air traffic controllers, if further capacity is required (there is a minimum volume of airspace beyond which further sectors cannot be introduced). Each of these sectors has a maximum number of aircraft that can be safely accommodated in a defined period. By summing the number of aircraft per sector per time period, and the number of air traffic controllers per sector, the available capacity can be determined. Where this capacity is exceeded, ATFM delay minutes will be generated. There are, of course, a number of other elements that are factored into this calculation, but the basics are as stated here.

Union-Wide Targets

10.5 The original and revised union wide En Route capacity targets are shown in the table below. As with the environment KPA, the lower delay targets in 2021 and 2022 reflect the anticipated lower levels of traffic (relative to original RP3 forecasts) and excess capacity. The targets in 2023 and 2024 remain unchanged, reflecting the fact traffic is projected to return to closer original RP3 forecast levels in 2023 and 2024.

Table 10.1: Union-wide En Route Delay Targets

ATFM delay mins. per flight	2020	2021	2022	2023	2024
Original targets	0.9	0.9	0.7	0.5	0.5
Revised targets	0.9	0.35	0.5	0.5	0.5
Percentage Reduction in target	-	61%	29%	-	-

Source: Commission Implementing Decision (EU) 2019/903 & Commission Implementing Decision (EU) 2021/891

En Route Capacity: Irish Targets

10.6 The NSA proposes to adopt the national reference values provided by the Network Manager, consistent with the union-wide targets above, as the En Route capacity targets for RP3. The original and revised Irish En Route capacity targets for RP3 are shown in the table below.

Table 10.2: Irish En Route ATFM Delay Targets, and Actual 2020 Performance

ATFM delay mins. per flight	2020		2021	2022	2023	2024
	Target	Actual	Target	Target	Target	Target
Original targets	0.07	-	0.07	0.07	0.04	0.03
Revised targets	0.07	-	0.01	0.03	0.03	0.03
Percentage Reduction in target	-	-	86%	57%	25%	-

Source: Ireland October 2019 Performance Plan & Network Manager

10.7 As noted earlier, the IAA ANSP is expected to contribute relatively more substantially to achieving the revised targets compared to achieving the original targets, though this is less the case than for the revised KEA target. Nonetheless, the IAA ANSP has previously generated very low levels of ATFM delay during RP2, notwithstanding traffic levels exceeding the forecasts, and generated zero ATFM delay in 2020. Thus, we see no reason to deviate from the national reference values as provided by the Network Manager for Ireland's revised Performance Plan.

Terminal Capacity

10.8 Similar to an En Route ACC, if arriving traffic demand at an airport is anticipated to exceed the available capacity, the Network Manager will assign ATFM delay to traffic at the departure airports. The resulting ATFM delay minutes are calculated as the difference between the estimated take-off time from the filed flight plan compared to the calculated take-off time allocated by the central unit of ATFM.

Irish Targets

10.9 There are no union-wide targets for terminal capacity, so these targets must therefore be set a local level by the NSA. The only Irish airport which generates arrival ATFM delay is Dublin Airport and almost all delay is not ANSP-attributable. In the original RP3 Performance Plan, the terminal capacity targets were set at a level consistent with the average minutes of delay per arrival at Dublin airport in RP2, with an improvement anticipated from when the second parallel runway was due to be operational.

10.10 In 2020, despite lower levels of traffic, the average minutes of delay per arrival at Dublin airport was slightly lower than most years in RP2 though remained at a broadly consistent level and was attributed to the same causes (weather and aerodrome capacity).

10.11 Therefore, given that the levels of arrival ATFM delay have remained broadly unchanged notwithstanding the traffic reduction, and most of the delay is not ANSP-attributable in any case, we see no reason to revise these targets relative to the original RP3 Performance Plan. This aligns with the proposal made by the IAA ANSP in its

Business Plan submission. More discussion on the terminal capacity targets is set out in the context of our proposed incentive scheme in Section 13.

Table 10.3: IAA ANSP Terminal Delay Targets, and Actual 2020 Performance

Arrival ATFM delay mins. per flight	2020		2021	2022	2023	2024
	Target	Actual	Target	Target	Target	Target
Original targets	0.25	0.11	0.25	0.2	0.2	0.2
Revised targets	0.25	-	0.25	0.2	0.2	0.2

Source: Ireland October 2019 Performance Plan

Compliance Measures and Monitoring

10.12 In its business plan, the IAA ANSP has outlined a range of ongoing initiatives that it states will enable it to continue providing sufficient capacity, including multi-ratings of ATCOs, flexible airspace sectorisation, 'crew-to-workload' staffing and the implementation of necessary procedures to facilitate parallel runway operations at Dublin airport. The IAA ANSP also plans to make (or has already made) several capital investments that will it improve its ability to provide capacity, including, in particular, the new Contingency En Route Operations Centre (CEROC) for the Shannon ACC, a number of COOPANS projects and the new control tower at Dublin Airport. These projects are discussed in more detail in Section 6 and Appendix 1.

10.13 The NSA will continue to monitor the implementation of these initiatives and will work to ensure sufficient measures are taken to comply with the performance targets. The inclusion of capital investments within the clawback mechanism and the En Route and terminal capacity incentive schemes will also act as additional incentive to ensure relevant planned investments and sufficient operational measures are undertaken. As discussed in Section 6, we have made allowances for such investments and as set out in Section 11 we have assessed that the regulated revenue stream will be sufficient to efficiently finance them.

11. Cost Efficiency KPA

11.1 At a Union-wide level, the cost efficiency KPA includes one KPI, which is the year-on-year change to determined unit costs (DUC) for En Route air navigation services, starting from the 2019 baseline DUC level. The PRB has set Union-wide DUC targets for both the 2019 baseline value and the year-on-year change throughout RP3. At a Member State level, the cost efficiency KPI includes two KPIs; the DUC for En Route services and the DUC for terminal services. When the EC/PRB assess the performance plans for approval, the En Route DUC is assessed with reference to the Union-wide target trend, the baseline DUC relative to each Member State's comparator group (which for Ireland includes Denmark, Finland, Norway and Sweden) and whether any deviations from the Union-wide trend can be justified in terms of achievement of other KPA targets or longer-term benefits for airspace users. The terminal DUC is assessed with reference to the En Route DUC trend and the DUC level at similar airports.

11.2 In order to calculate an appropriate level of allowed determined costs for the ANSP in RP3, the NSA has followed the regulatory building blocks approach, consistent with the regulations, its previous regulatory decisions and its general approach to economic regulation. The building blocks used to calculate the determined costs for RP3 include:

- An efficient level of operating costs based on the forecast level of traffic and required level of resources;
- Depreciation charges based on capital expenditure prior to RP3 and the allowed level of capital expenditure in RP3;
- The cost of capital based on the allowed asset base and an efficient WACC; and
- Exceptional items for costs related to VSS (Voluntary Severance Schemes) and VER (Voluntary Early Retirement) in 2021.

Union-wide Targets

11.3 The original and revised union-wide En Route cost efficiency targets are shown in the table below. 2020 and 2021 have been combined as one period for the cost efficiency KPA, with the DUC target revised upwards significantly. The DUC target trend is reduced in the remaining years of RP3, though the implied DUC level is higher relative to the original targets at the end of the period.

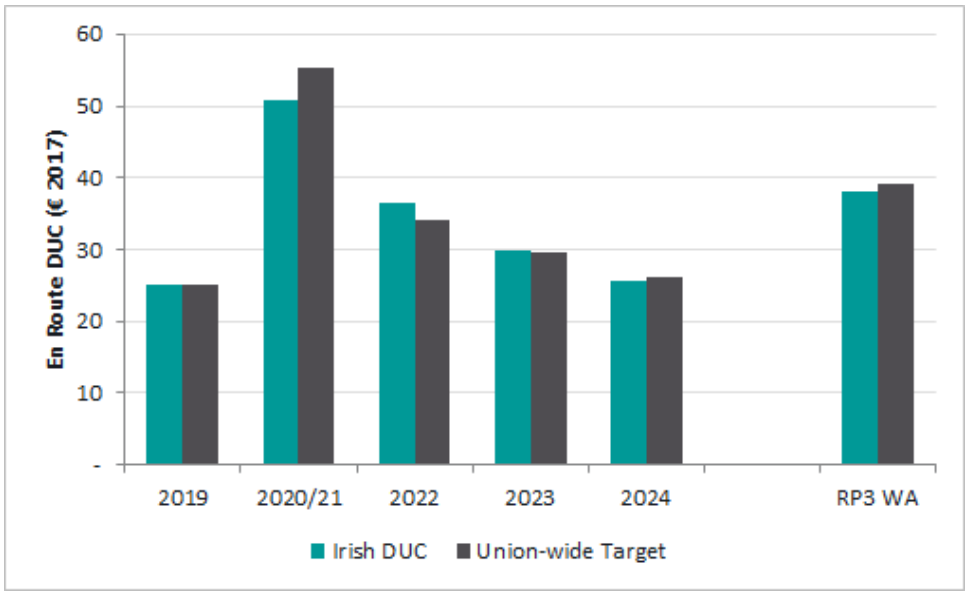
Table 11.1: Cost Efficiency KPA: Union-wide Targets

En Route DUC growth	Metric	2020	2021	2022	2023	2024
Original targets	YoY Change %	-1.9%	-1.9%	-1.9%	-1.9%	-1.9%
	Index (2019=100)	98.1	96.2	94.4	92.6	90.9
Revised targets	YoY Change %	+104.2%		-36.5%	-15.0%	-12.4%
	Index (2019=100)	204.0		125.5	108.9	96.4

Source: Commission Implementing Decision (EU) 2019/903 & Commission Implementing Decision (EU) 2021/891

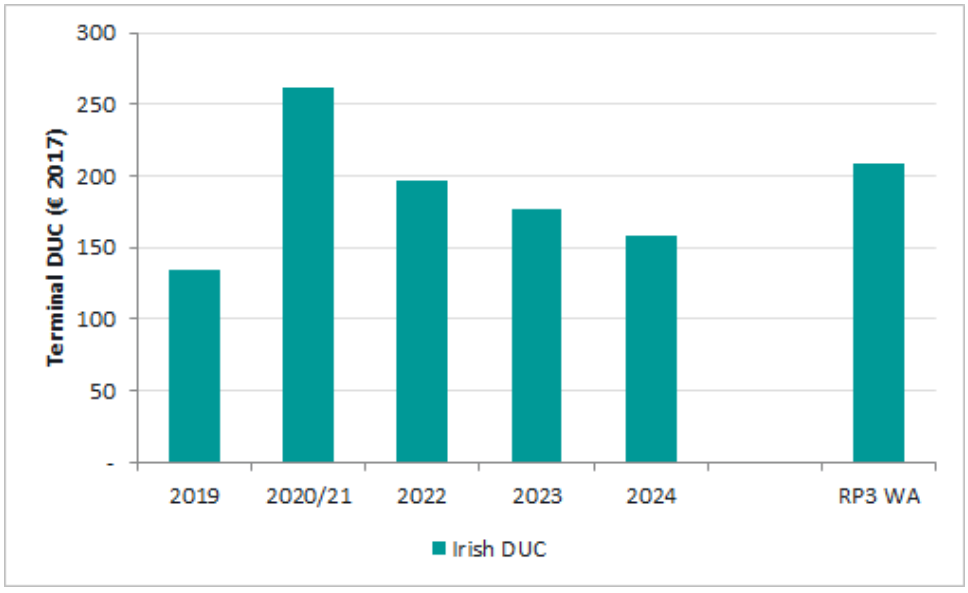
11.4 The proposed En Route DUC, against the Union-wide target trend, and the Terminal DUC across RP3 are shown in the figures below. The DUCs and Union-wide target trend are shown relative to the 2019 baseline value and include IAA ANSP, MET ASD, and supervision costs.

Figure 11.1: Cost Efficiency KPA: En Route DUC vs. Union-wide Targets



Source: CAR Calculations

Figure 11.2: Cost Efficiency KPA: Terminal DUC



Source: CAR Calculations

11.5 The year-on-year change to the En Route DUC is in line with the Union-wide trend, though there is some variation between years. In particular, 2022 is above the target; in that context we note that while the Eurocontrol May forecast was generally higher than the previous forecast, the 2022 En Route service units actually reduced. Overall, however, the weighted average (WA) En Route DUC (weighted by SUs) is €1.09 (2.8%) lower than equivalent value implied by the En Route Union-wide DUC target and 2024

is below target. Though there is some variation between years, the terminal DUC follows a similar trend over the period.

11.6 We consider that this level of costs is necessary in order to continue meeting the capacity, environment and safety KPA targets, particularly in order to ensure compliance with the requirements of Regulation (EU) 2017/373, as advised by Steer. In addition, specific local factors which were not in the cost base in 2019 include the En-route Contingency Centre (CEROC), and the new tower and commencement of parallel runway operations at Dublin Airport. The CEROC will enhance the capability of the IAA ANSP to reliably provide the required level of safety, capacity, and environmental performance for to En Route traffic. Parallel runway operations at Dublin Airport will, in the context of the anticipated recovery in traffic by 2023/2024, have a significant impact on taxi-out times and alleviate the airfield capacity related congestion experienced in 2019. As well as the associated capital investment, these projects will require additional training, engineering capability and, once operational, operational expenses, as have been provided for by Steer in their forecasts.

11.7 Overall, our analysis suggests that, in real terms, the IAA ANSPs costs will need to escalate slightly above 2019 levels in 2022, and with further, more moderated, escalation required in 2023 and 2024.

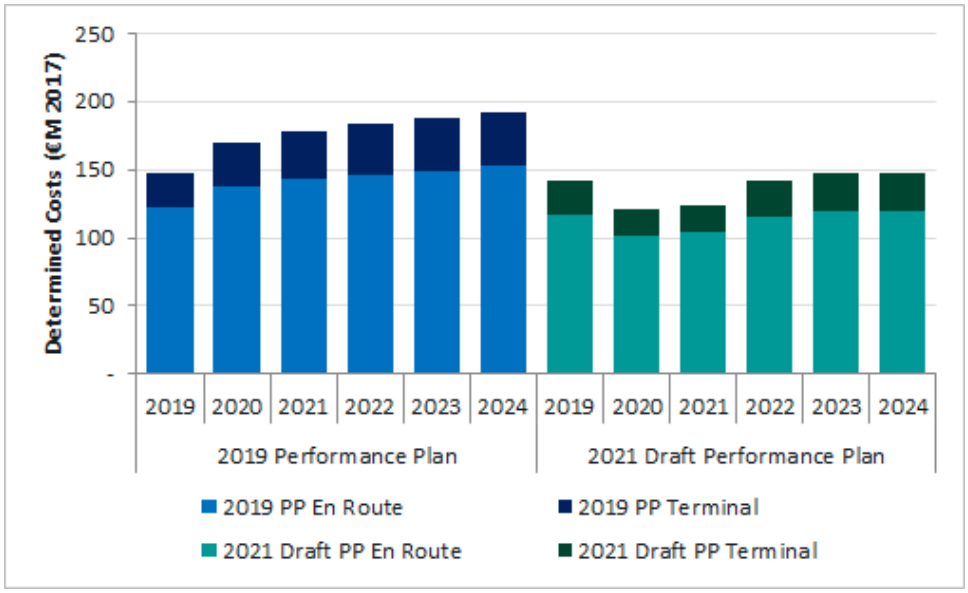
11.8 It should be noted that the above DUC analysis relative to the target is inclusive of the proposed €3m baseline adjustment in relation to MET ASD actual costs for 2019, as described in Section 7.

Comparison with 2019 RP3 Performance Plan

11.9 As noted above, the regulated entities have developed fully revised Business Plans, and we are developing a fully revised Performance Plan, as compared to the original RP3 plan. That plan was developed in anticipation of a very different set of prevailing circumstances during RP3, and we consider it important to ensure that the new plan appropriately reflects the changed circumstances.

11.10 Total determined costs, across ANSP, MET and supervision services, within the 2019 performance plan (PP) and the draft 2021 PP (i.e., this consultation document) are shown in the figure below. We consider that this figure reflects the extent to which the regulated entities and the NSA have sought to take account of these circumstances.

Figure 11.3: Cost Efficiency KPA: Total Determined Costs vs. 2019 PP

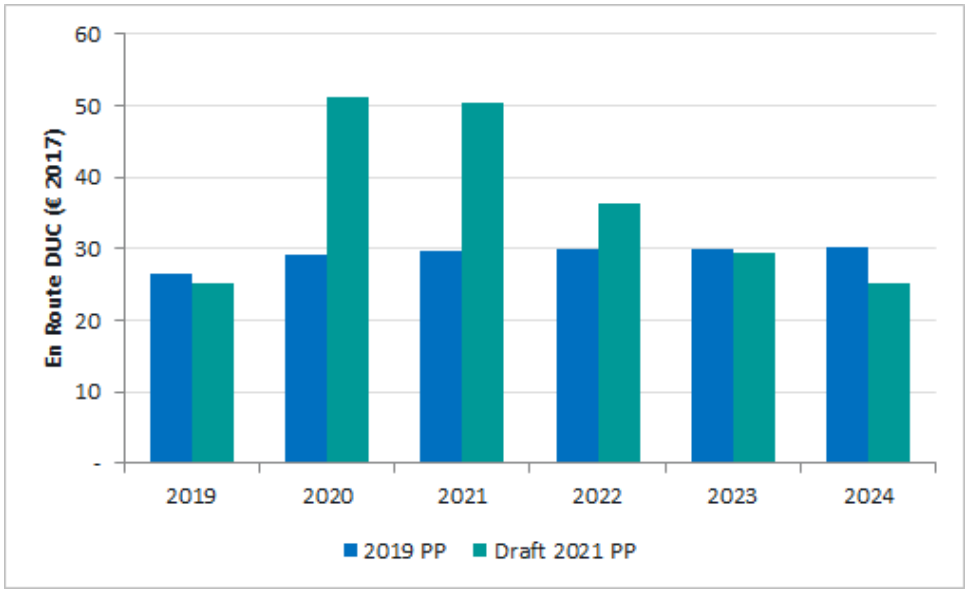


Source: 2019 Draft PP, CAR Calculations

11.11 Due to the 2019 baseline figures in the 2019 Performance Plan being projected figures, but actual figures within the 2021 draft Performance Plan, the 2019 baseline value is €5.3 million lower in the 2021 draft Performance Plan in real terms. The Determined Costs across RP3 are also lower than the previous plan due to a combination of lower levels of traffic, reductions in allowed operational and capital expenditure and a more efficient WACC. Total Determined Costs are now proposed to be €230 million (25.2%) lower across RP3 in real terms, relative to the original plan.

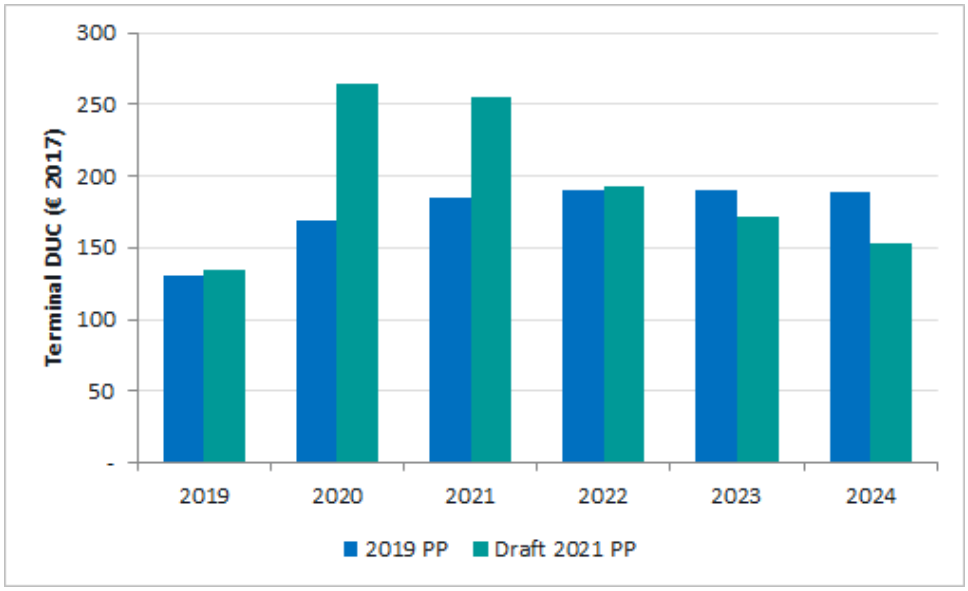
11.12 The DUC for En Route and Terminal navigation services are shown in the figures below.

Figure 11.4: Cost Efficiency KPA: En Route DUC vs. 2019 PP



Source: 2019 Draft PP, CAR Calculations

Figure 11.5: Cost Efficiency KPA: Terminal vs. 2019 PP



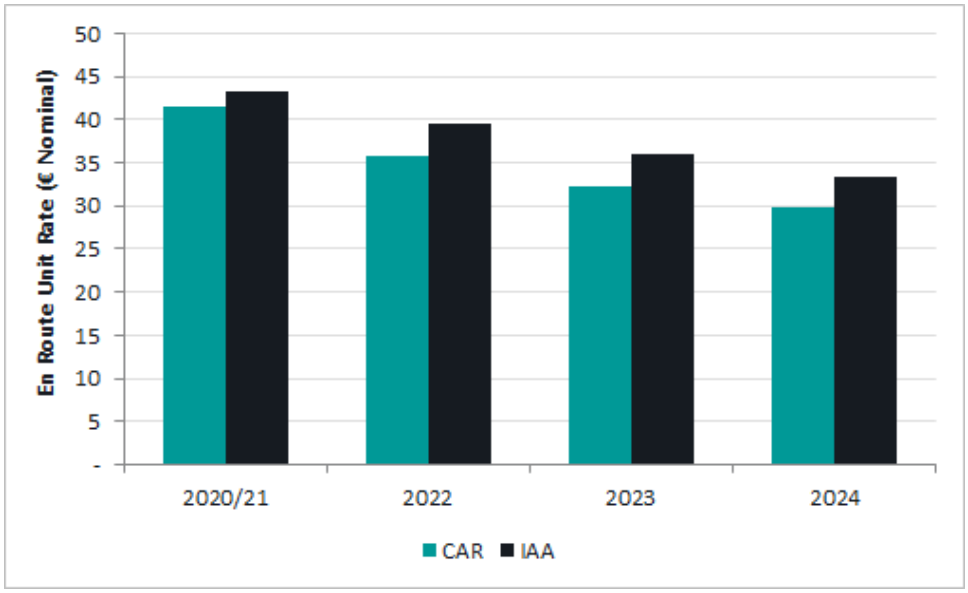
Source: 2019 Draft PP, CAR Calculations

11.13 Due to the significantly reduced level of SUs in 2020 and 2021, relative to the levels projected in the 2019 Performance Plan, the En Route and Terminal DUC is higher in these years. As traffic is projected to recover in the subsequent years of the period, both the En Route and Terminal DUC is reduced to below the level of the 2019 Performance Plan by 2023.

Unit Rates

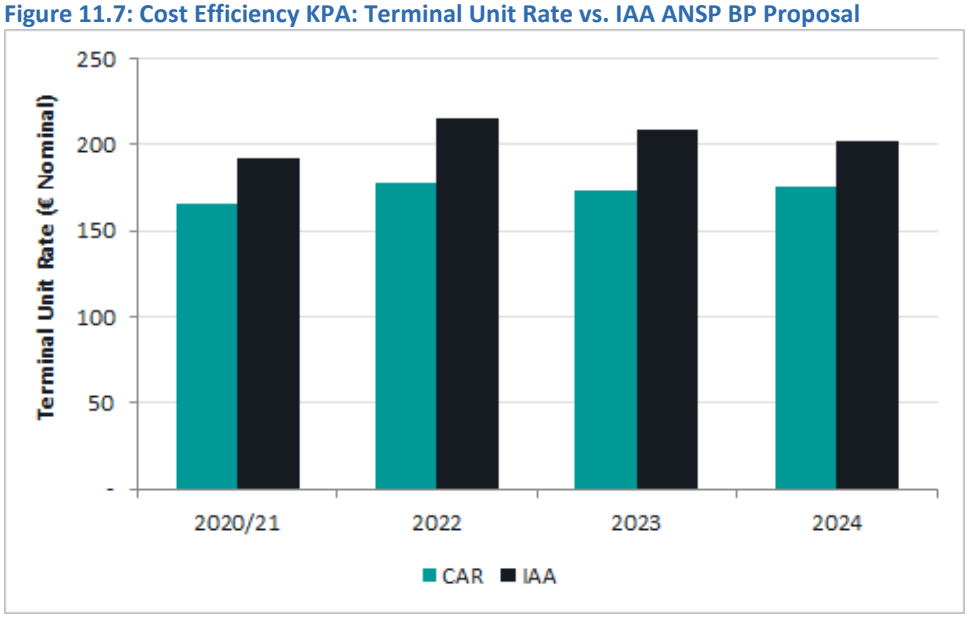
11.14 The En Route and Terminal forecast unit rates across RP3, relative to those proposed by the IAA ANSP in its BP, are shown in the figures below in nominal prices. The unit rates shown include only adjustments relating to previous periods at the start of the period, and adjustments relating to lost revenue (in 2020 and 2021) impacting from 2023. Other potential within-period adjustments, such as in relation to inflation and traffic risk sharing, are not known at this stage.

Figure 11.6: Cost Efficiency KPA: En Route Unit Rate vs. IAA ANSP BP Proposal



Source: CAR Calculations

Figure 11.7: Cost Efficiency KPA: Terminal Unit Rate vs. IAA ANSP BP Proposal



Source: CAR Calculations

11.15 Relative to the IAA ANSP BP proposal, the En route and Terminal unit rates are 8.4% and 15.3% lower respectively, with difference driven by reductions to ANSP operating costs, capital expenditure and WACC. The variance between the En Route and Terminal reductions is driven by the higher capital to operating cost ratio forecast for the provision of Terminal services, and the fact that overall our adjustments have had more impact on capital rather than operating costs (in particular, the adjusted asset life of the Dublin tower). MET and supervision costs are unchanged across the two proposals shown, and are in line with the figures presented in Section 7.

11.16 The NSA proposes that the revenue lost in 2020 and 2021 should be recovered over the maximum allowed period of seven years, in order to, as far as possible, smooth the profile of the impact on unit rates in each year. This assumption, as well as other unit rate assumptions can be adjusted in the model.

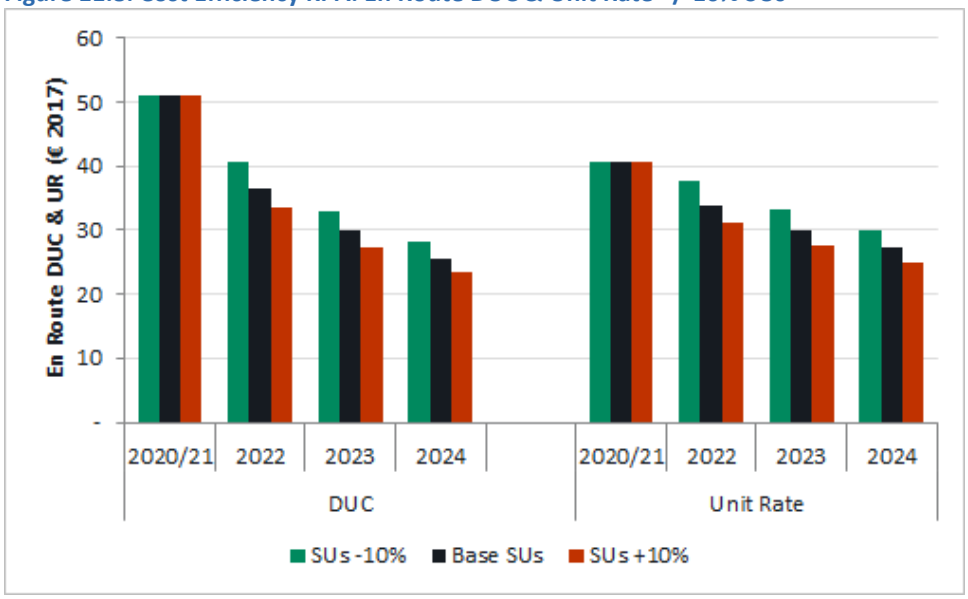
11.17 Note that, in reality, there are likely to be a number of other adjustments to unit rates from 2022, arising from the inflation, the traffic risk sharing, cost sharing mechanisms, as well as other revenues and incentive payments. These adjustments will increase or decrease the unit rate depending on the level of costs, traffic or delay relative to the projections within this draft Performance Plan.

Scenario Analysis

11.18 As described in Section 3, in a letter dated 5 July, the European Commission asked that, as part of this consultation, NSAs present sensitivity analysis in relation to variations in the service unit forecasts. We have duly assessed the impact of 10% higher and 10% lower forecast SUs on our cost forecasts, from 2022, relative to current projections. These variations represent revised forecasts that would be included within the final Performance Plan, not variations in actual traffic levels relative to forecasts within the period (which means that no traffic risk sharing mechanism payments would be triggered, but rather the baseline DUC itself would be adjusted).

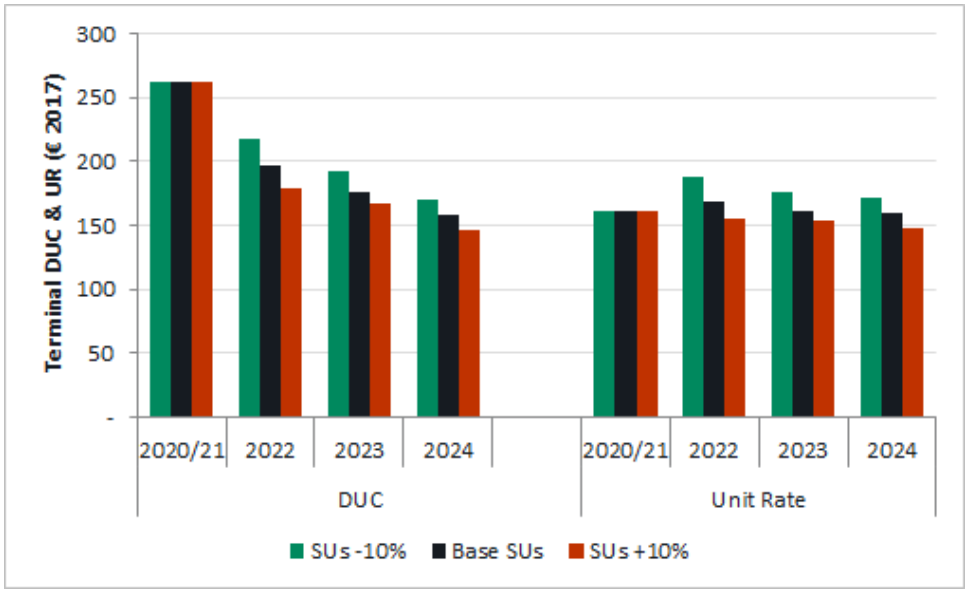
11.19 The impact of these two scenarios on En Route and terminal DUC and unit rates is shown in the figures below. To estimate these scenarios, we have used the Opex model provided by Steer. The revised Capex programme is relatively insensitive to the traffic levels; the scenarios below assume that the allowed programme would remain unchanged. In the event of a major reduction in forecast service units, this may need to be also reconsidered on the grounds of affordability.

Figure 11.8: Cost Efficiency KPA: En Route DUC & Unit Rate +/-10% SUs



Source: Steer Opex Model & CAR Calculations

Figure 11.9: Cost Efficiency KPA: Terminal DUC & Unit Rate +/-10% SUs



Source: Steer Opex Model & CAR Calculations

11.20 Based on our assessment of an efficient level of ANSP operating costs, more or less traffic implies the operating cost requirement will marginally increase or decrease accordingly. Therefore, at a total cost level, ANSP operating costs increase, from 2022, when SUs are increased by +10% and decrease when SUs are reduced by -10%. However, due to the IAA ANSP's high level of fixed costs, only a small proportion of operating costs are affected; capital expenditure, MET costs and supervision costs are not affected, at least within the bounds of a 10% variation.

11.21 The majority of the impact is therefore due to different SU forecasts being used to calculate the DUC and unit rates; given the majority of costs are fixed, changes to the level of SUs will affect DUC and unit rates far more at a unit, than at a total, level. The impacts are summarised in the table below.

Table 11.2: Cost Efficiency KPA: Impact of +/-10% SUs

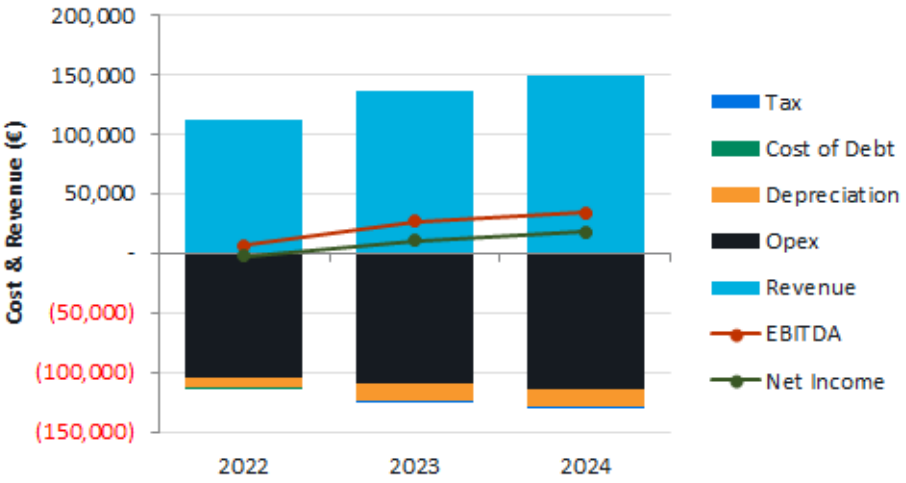
Scenario	En Route		Terminal	
	DUC	Unit Rate	DUC	Unit Rate
+10% SUs	(8.4%)	(8.4%)	(7.5%)	(7.2%)
-10% SUs	10.5%	10.5%	9.23%	9.31%

Source: CAR Calculations

Financial Analysis

11.22 As is our normal practice in economic regulation, we have also assessed the financial viability of the regulated entity and stress tested our proposals. The IAA ANSP's projected profitability in the remaining years, based on only the regulated activities outlined above, is shown in the figure below.

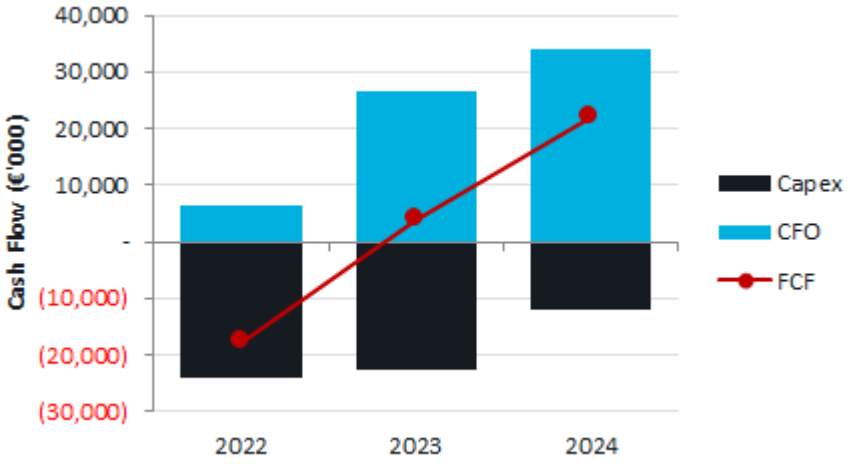
Figure 11.10: Cost Efficiency KPA: IAA ANSP Profitability



Source: CAR Calculations

11.23 Profitability in EBITDA terms is projected to be positive in 2022, and in net income terms by 2023. Due to a significant level of planned capex described above, free cash flow (FCF) is projected to be negative in 2022 and positive, but small, in 2023. As outlined above, unrecovered allowed revenues in 2020/2021 will be recoverable from 2023. The IAA ANSP currently has no debt. This is therefore a significant factor in the IAA ANSP's forecast profitability from 2023, which we (currently) estimate will provide an annual revenue stream of approximately €11.5m per year.[41]

Figure 11.11: Cost Efficiency KPA: IAA Cash Flow



Source: CAR Calculations

11.24 The level of cash reserves the IAA ANSP will have at the start of 2022 as a result of the restructuring of the organisation is unknown at this time. Therefore, given the uncertainty and as a limit case which ensures that the financial position can only be better than what we model, we test a scenario of zero cash at 1 January 2022 for the purposes of the below analysis.

11.25 The IAA's Debt/EBITDA and Cash flow from operations (CFO)/Debt ratios are shown in the table below. Under the base scenario projections, these ratios are well within a

[41] The final figure will depend on cost and service unit outturns over the rest of 2021.

sustainable range; the maximum debt requirement peaks at €30m in 2023, which is linked to the higher level of Capex forecast for 2022 and 2023.

11.26 An unplanned 10% increase in operating costs from 2022-2024 worsens the ratios somewhat, but we still consider these to be at a sustainable level – particularly given the IAA's low cost of debt. The reduced Free Cash Flow modelled under this downside scenario might also represent an equivalent level of Capex overspend of about €10m per year.

Table 11.3: Cost Efficiency KPA: IAA ANSP Coverage Ratios

Scenario	Ratio	2022	2023	2024
Base	Debt/EBITDA	-	0.47	0.25
	CFO/Debt	-	2.11	3.98
+10% Opex	Debt/EBITDA	-	1.48	1.33
	CFO/Debt	-	0.68	0.75

Source: CAR Calculations

11.27 Having regard to the above, we are confident that even in the event of a severe downside scenario where actual costs exceed Determined Costs, our proposed level of Determined Costs will generate a regulated revenue stream which is sufficient to enable the financial viability of the regulated entity. We have set targets which we consider to be achievable, while achieving compliance with the other KPAs, but even if the IAA ANSP is unable to fully meet our cost efficiency targets, performance in the other KPAs does not need to be degraded.

11.28 We also note that, should there be a significant change in circumstances within the period, the regulation provides for a process whereby the Performance Plan may be re-opened.

12. Interdependencies

12.1 An important element of the target-setting process for each of the KPAs is the consideration of the extent to which interdependencies exist, and therefore the extent to which there are potential trade-offs between the achievement of performance targets across different KPAs.

12.2 Conceptually, there is a trade-off between cost efficiency and each of the other three KPAs – capacity, environment, and safety. Improving performance in each of these areas may require additional resources to be deployed and additional costs to be incurred, which will increase costs and reduce cost-efficiency performance.

12.3 The trade-off between cost efficiency and the other three KPAs also implies that there are potential trade-offs between the capacity, environment, and safety KPAs, as, if performance improvements are mutually exclusive, costs incurred in improving one KPA implies foregoing improving another. In practice, performance improvements in each KPA may not be fully mutually exclusive, though costs incurred in one area are likely to improve performance in one KPA more than others, which implies some level of trade-off.

12.4 It is also possible, in theory, that improvements in performance in one KPA may reduce performance in another (as opposed to not improving it), which could imply a greater level of trade-off between KPA performance.

12.5 It should also be noted that where trade-offs exist, they are unlikely to be linear and are likely to be subject to diminishing returns. For example, the improvements to performance in any of the safety, capacity, or environment KPAs that can be achieved, for a given level of cost, are likely to decrease the more performance is improved.

12.6 Interdependencies and trade-offs can inform the target-setting process such that KPA targets are set at the optimum point that maximises the combined performance achieved across all KPAs. However, the extent to which this can be achieved in practice is limited by regulatory and other constraints. The remainder of this section discusses some of the interdependencies and trade-offs between the KPAs in more detail.

Safety and the Other KPAs

12.7 While a trade-off between safety KPA performance and other KPA performance is likely to exist, the importance of ensuring the required level of operational safety and safety management means that these trade-offs should not be given much consideration. In the context of other KPAs, all necessary costs should be incurred in order to achieve the required level of safety performance, irrespective of whether the funds and resources associated with these costs could yield greater improvements in performance in other KPAs (or adversely affect performance in other KPAs). As noted in Section 11, we have assessed a downside scenario whereby significant additional costs are required relative to the Determined Costs, and are confident that the proposed Determined Costs and consequent Unit Rates are sufficient to enable the financial viability of the IAA ANSP even in such a scenario.

12.8 The IAA ANSP's view on the interdependencies between safety and other KPAs is

consistent with this. Within its RP3 Business Plan, the IAA ANSP has stated that any decisions that include consideration of interdependencies or trade-offs between safety and other KPAs, will be managed such that the required level of safety performance will not be compromised.

Capacity and Cost Efficiency

12.9 For an ANSP operating at an efficient level, providing additional capacity will incur additional costs; however, establishing relationship between cost efficiency and capacity is not straightforward in practice as there are a number of dimensions to consider.

12.10 The relationship between cost efficiency and ANSP-attributable delay is likely to be largely long term, with additional capacity provided by either by capital investment in infrastructure or training of additional ATCOs, both of which have lead times of several years (although some additional capacity could be provided in the short term through, for example, additional staff overtime). The level of traffic, particularly when significantly higher than forecast, is also an important driver of available capacity and delay.

12.11 The IAA ANSP has stated within its RP3 BP that if staffing levels fall below the planned level for RP3, there is likely to be increased delays in peak months in the latter years of RP3, which implies it considers staffing levels to be the primary driver of the interdependency between capacity and cost efficiency.

12.12 Ideally, capacity targets should be set at the optimum point where the marginal cost associated any additional reduction in delay exceeds the marginal economic benefits associated with any further delay reduction. This aligns with the PRB's economic cost of delay concept. An estimation of this optimum point is considered by the PRB when setting union-wide capacity targets and Member State reference values.

12.13 Throughout RP2, Ireland's ANSP-attributable delay was close to zero and was significantly below the target level, and although the capacity reference values and targets have been reduced for RP3, Ireland's delay is not projected to exceed the new targets in RP3 – due in part to the fact traffic is projected to remain below 2019 levels throughout most of RP3. Based on current levels of delay and the PRB targets, the IAA ANSP appears to be operating at a point where there is limited scope for further reduction in delay and the monetary costs associated with this are likely to exceed the value of any savings in terms of the cost of delay.

Capacity and Environment

12.14 While a trade-off between improving performance in either the capacity or environment KPA could exist (if improving one KPA meant forgoing improvements in the other), in practice it appears there is currently little or no trade-off between improving performance in either these KPAs in Irish airspace.

12.15 Less capacity and more congested airspace imply that airspace users have less ability to use the most efficient flight routing and, conversely, more capacity implies more efficient flight paths can be achieved. Therefore, while performance in these KPAs

appears to be interdependent, there does not appear to be an inherent trade-off.

12.16 It is possible, in some circumstances, particularly in very congested airspace, that the most efficient flightpath could have an adverse impact on capacity and increase delay; however, this does not appear to currently be the case in Irish airspace. Within its RP3 BP, the IAA ANSP has stated that the implementation of any measures that restrict capacity will adversely impact environmental performance, implying that performance in each of the two KPAs is correlated.

13. Traffic Risk Sharing and Incentives

Traffic Risk Sharing

13.1 The traffic adjustment (the Traffic Risk Sharing mechanism - TRS) is the central risk sharing mechanism in RP3 and applies to the ANSPs' determined costs based on the difference between Performance Plan forecast and actual service units. Service unit variance of +/-2% of the Performance Plan forecast results in no adjustments, SU variance of +/-2% to +/-10% around the forecast result in 70% of the difference passed onto airspace users and SUs +/-10% around the forecast result in all of the difference being passed onto airspace users. The ANSP's maximum traffic risk exposure is therefore +/- 4.4% of determined costs (2%+(30%*8%)). The adjustments are made to the unit rate in year n+2.

13.2 In normal circumstances, a +/-10% variation is considered a large variation and at this point a revision of the Performance Plan may be appropriate.

13.3 The parameters for the TRS are set out in Regulation 2019/317, however, the NSA can decide to alter these in order to increase (though not decrease) the ANSP's revenue risk exposure above the 4.4%. We do not propose to alter the TRS parameters for the IAA ANSP above the default level.

Overview of Incentive Schemes

13.4 The incentive scheme parameters which NSAs need to specify within the Performance Plan are set out within Regulation 2019/317, supplemented by the supporting material on incentives[42], which provides additional guidance on how parameters should be set. Regulation 2020/1627 states that in RP3, the incentive schemes will only apply, and produce financial carry overs, from 2022 to 2024.

13.5 A depiction of how these parameters were specified within Ireland's original RP3 Performance Plan is shown in Figure 13.1 and Figure 13.2 below.

Pivot Value

13.6 As a default position, pivot values for the incentive schemes are set based on national delay targets but can be modulated by the NSA (including in each year throughout the period) in response to either significant changes to the level of traffic or in the level of delay attributable to the ANSP based on the applicable Network Manager (NM) codes (set out below).

13.7 The option to modulate the pivot value based on significant changes in traffic, relative to forecast levels, is based on the assumption that there is a relationship between the level of traffic and delay, and that ANSPs may be unfairly penalised for delays if traffic grows significantly (and vice versa for bonuses). However, modulation based on changes to traffic levels can only really be implemented during the reference period if there is a significant deviation from the Performance Plan forecast.

[42] Supporting Material on Incentive Schemes for the 3rd Reference Period of the SES Performance Scheme

13.8 Modulating the pivot value based on traffic would require a systematic approach (including an implied elasticity relationship between traffic and delay) to be agreed and set out within the performance plan. Should a significant unforeseen change in traffic arise, any changes to the pivot value would need to be tied in to changes to delay targets and refer to the most recent reference values in the Network Operations Plan (NOP).

13.9 The option to modulate the pivot value based on ANSP-attributable delay is based on the rationale that ANSPs should only be incentivised to reduce delay which is within their control. However, it should be noted that while the pivot value can be modulated based on ANSP-attributable delay, the other incentive scheme parameters are still based on total delay.

Threshold

13.10 The threshold around the pivot value corresponds to the values at and beyond which the maximum penalty or bonus payments are paid. As set out in the regulation, the En Route capacity incentive scheme threshold is based on "the variation of the reference values as a result of the seasonal updates of the Network Operations Plan … in comparison to the reference values from the latest version of the Network Operations Plan available at the time of drawing up the performance plan".

13.11 The supporting material on incentive schemes further states that where the NOP reference value is below 0.2, which applies in Ireland, the threshold should be set at +/-0.05 average minutes of delay per flight. The thresholds within the terminal capacity incentive scheme are also fixed within the regulation at -50% and +150% (equivalent to +/-50%) of the pivot value. For these reasons, these should be the values used in the revised Performance Plan.

13.12 It should be noted that in cases where the delay target (and default incentive scheme pivot value) is smaller than 0.05, as was the case in some years in Ireland's original RP3 performance plan, the lower threshold would be negative. In such cases, the lower threshold would necessarily become zero, as the concept of negative delay is not considered.

Deadband

13.13 For both Terminal and En Route incentive schemes, the deadband around the pivot value is the point at which the minimum bonus and/or penalty payments are paid, with bonus and/or penalty payments increasing up to the maximum level at the threshold value. The deadband can also be set at the level of the threshold value, so that the maximum and minimum bonus and penalty payments are the same.

13.14 Unlike the threshold and pivot values, the regulation does not stipulate what the deadband value should be, nor contain guidance on how it should be modulated from a default value, except for the fact that the deadband must be symmetrical around the pivot value. NSAs therefore have a more proactive role in setting and justifying the deadband compared to the threshold and pivot value.

Bonus and Penalty Payments

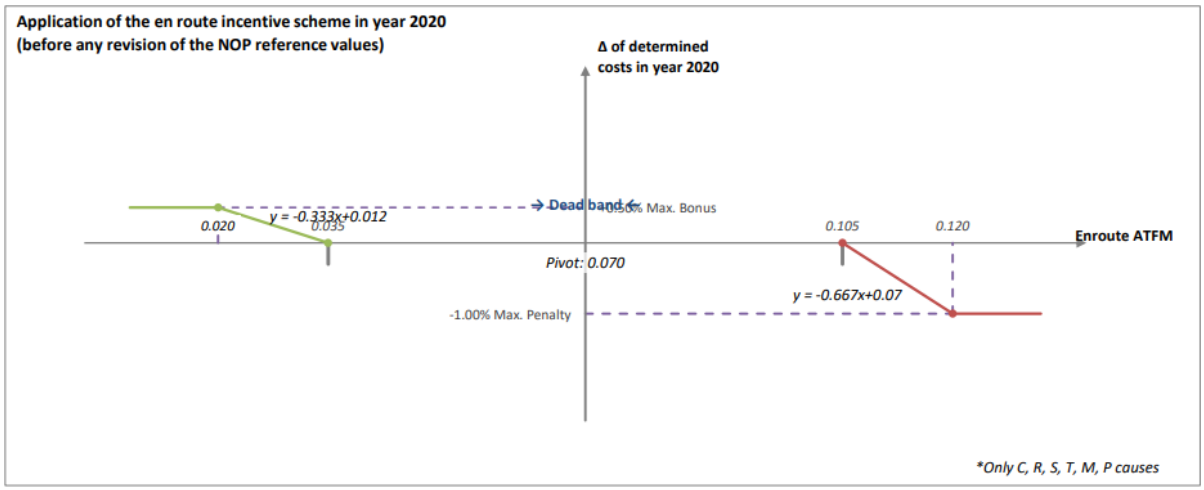
13.15 The regulation states that incentive schemes should contain bonus and penalty payments that have a "material impact on revenue at risk". While the regulation does not state what this means in percentage terms, bonus payments are capped at 2% of determined costs (determined costs are used instead of revenues to avoid issues with adjustments). Penalty payments must be equal to or greater than bonus payments, although there are no stipulations beyond this.

13.16 The guidance material also states that in cases where the delay target and pivot value is close to zero, which is the case in Ireland, penalty-only schemes should be considered as there is limited scope for improved delay performance.

Previous RP3 Performance Plan

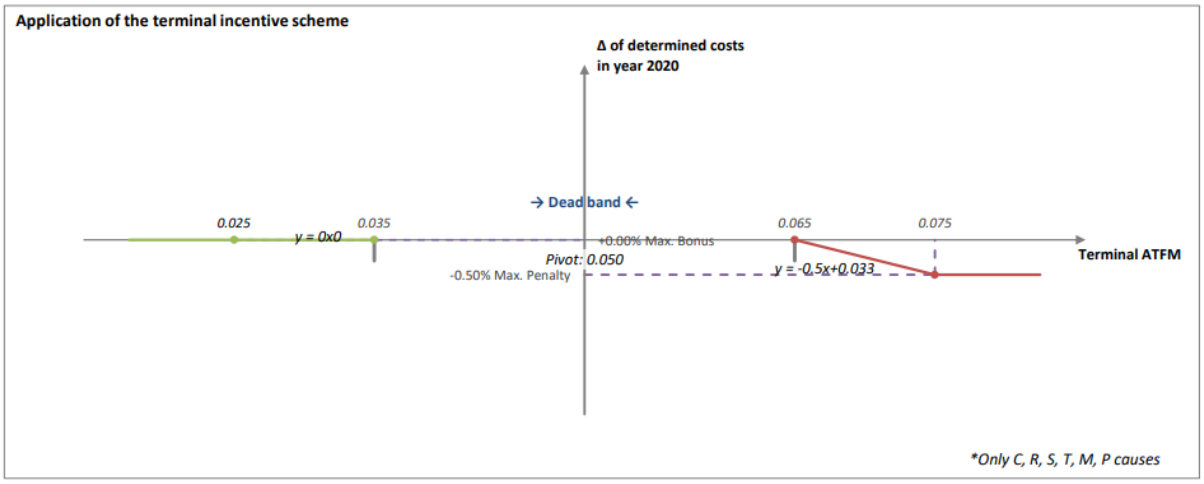
13.17 Within Ireland's original RP3 PP, the incentive schemes were set as shown in the tables and charts below.

Figure 13.1: RP3 En Route Incentive Scheme (October 2019)



Source: Ireland RP3 PP (October 2019)

Figure 13.2: RP3 Terminal Incentive Scheme (October 2019)



Source: Ireland RP3 PP (October 2019)

Table 13.1: Incentive Scheme Parameters (October 2019)

Service	Parameters	Unit	2020	2021	2022	2023	2024
En Route	Target	Avg. mins delay	0.07	0.07	0.07	0.04	0.03
	Pivot value	Avg. mins delay	0.07	0.07	0.07	0.04	0.03
	Deadband	%	+/-50%				
	Threshold	Avg. mins delay	+/-0.05				
	Max. bonus	% of DC	0.5%				
	Max. penalty	% of DC	1.0%				
Terminal	Target	Avg. mins delay	0.25	0.25	0.2	0.2	0.2
	Pivot value	Avg. mins delay	0.25	0.25	0.2	0.2	0.2
	Deadband	%	+/-30%				
	Threshold	Avg. mins delay	+/-0.05				
	Max. bonus	% of DC	-				
	Max. penalty	% of DC	0.5%				

Source: Ireland RP3 PP (October 2019)

13.18 The original RP3 Performance Plan stated that the pivot values within each scheme would be modulated each year based on updated reference values within each year's NOP and ANSP-attributable delay causes in the previous year. However, the initial pivot values included within the PP were set as equivalent to the delay targets.

13.19 The PRB noted that the IAA ANSP was expected to achieve the En Route targets for all years in RP3 and this was this is likely to result in bonuses as part of the En Route incentive scheme. The PRB also questioned whether 0.5% of DCs was a sufficiently large penalty within the terminal incentive scheme.

13.20 The main comments from airspace users and their representatives (Aer Lingus, Ryanair, IATA) were that the capacity incentive scheme pivot values were too high given historic delay performance.

Environment Incentive Scheme

13.21 Under Regulation 2019/317, NSAs can elect to implement an environmental scheme to incentivise improved performance in the environment KPA, in the form of reduced horizontal route extension (KEA).

13.22 As set out in Section 9, the IAA ANSP's KEA performance throughout RP2 was relatively strong and was consistently below the target level. While there could be some scope to improve the KEA score further, unlike delay it is unclear what proportion of KEA is ANSP-attributable. The ANSP should only be financially incentivised to reduce KEA that is within its control, and without this information, it is difficult to implement a fair and effective incentive scheme. Furthermore, as set out in Section 9, we believe that the IAA ANSP has been assigned a challenging target based on a challenging national reference value, which should in itself be sufficient to ensure a focus on improving this indicator to the extent possible.

13.23 We also note that, within the original RP3 PPs, only the UK CAA opted to include an environmental KPA incentive scheme. If an environmental incentive scheme were to

be implemented, more work would need to be undertaken to establish the key drivers of KEA performance in Ireland, and consequently whether an incentive scheme would be likely to produce better performance.

13.24 Therefore, we do not propose to implement an environment KPA incentive scheme for RP3. This is consistent with the original RP3 Performance Plan.

Setting Parameters for Revised Capacity Incentive Schemes

13.25 The approach to setting the parameters within this section is based on the revised RP3 capacity targets adopted in June 2021 and the associated national reference values for Ireland as discussed in Section 10.

En Route Capacity Incentive - Approach

13.26 One of the underlying concepts of the capacity targets set by the PRB is total economic cost (TEC), which is the combined cost of ANS service provision and the cost of delay, based on a monetary assumption of the economic cost of delay. Using only the concept of TEC, delay targets would be set at optimum point where the TEC minimised at the point where any additional ANS provision costs associated with reducing delay would exceed the marginal cost of delay saving. In practice, delay targets are set after also taking into account capacity performance and other constraints, not only the optimal TEC.

13.27 The objective of the incentive schemes is to provide financial incentives to ANSPs to bring delay towards an economically optimum level by eliciting behaviour change. Therefore, the NSA should consider what it is trying to incentivise the ANSP to do. The objective of the capacity incentive scheme could be to encourage the ANSP to, for example, staff at optimal levels, efficiently invest in additional capacity, or enhance the efficiency of operational procedures. Ideally, incentive schemes should be:

- Economically efficient, such that they incentivise efficient decisions in the planning and use of airspace in the context of SES objectives.
- Clear and intelligible, such that objectives of the incentive are clear and the outcomes easy to measure and monitor relative to the targets set.
- Straightforward to implement and monitor, such that administrative costs are proportional to the scope of the scheme.
- Credible with stakeholders in terms of understanding and acceptance of the rationale and objectives.
- Minimising the risk of perverse behaviours, where possible.

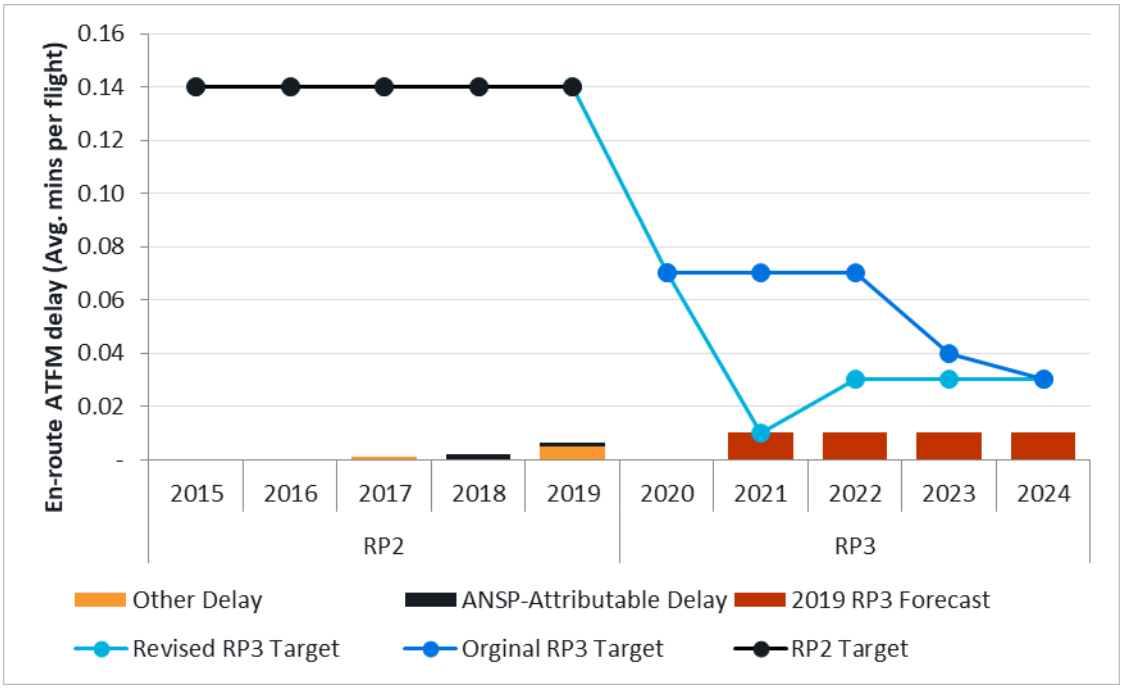
13.28 In practice, the capacity incentive schemes should attempt, as much as possible, to achieve the above within the parameter-setting constraints set out in the Regulation. Having reviewed the approaches taken elsewhere, NSA parameters generally appear to be set using a relatively simple approach based on what is logical and reasonable based on historic levels of delay and consultation with stakeholders.

Delay in Ireland

13.29 The levels of En Route ATFM delay and arrival ATFM delay in RP2 relative to the original and revised RP3 targets are shown in Figures 13.3 and 13.4. The RP3 level of forecast ATFM delay within the 2019 NOP is also shown for reference (forecasts are not provided in the NOP for terminal ATFM delay). Under the SES performance scheme, the causes of delay which are deemed to be ANSP-attributable are as follows (with NM codes):

- ATC capacity (C); where demand exceeds capacity.
- ATC routing (R); where demand and capacity are not adequately allocated.
- ATC staffing (S); where delays are due to staff shortages.
- ATC equipment (T); where delays are due to the availability or quality of equipment.
- Military (M); where delays are due to route or airspace route availability due to military activity.
- Special event (P); where delays are due to one-off planned capacity shortage.

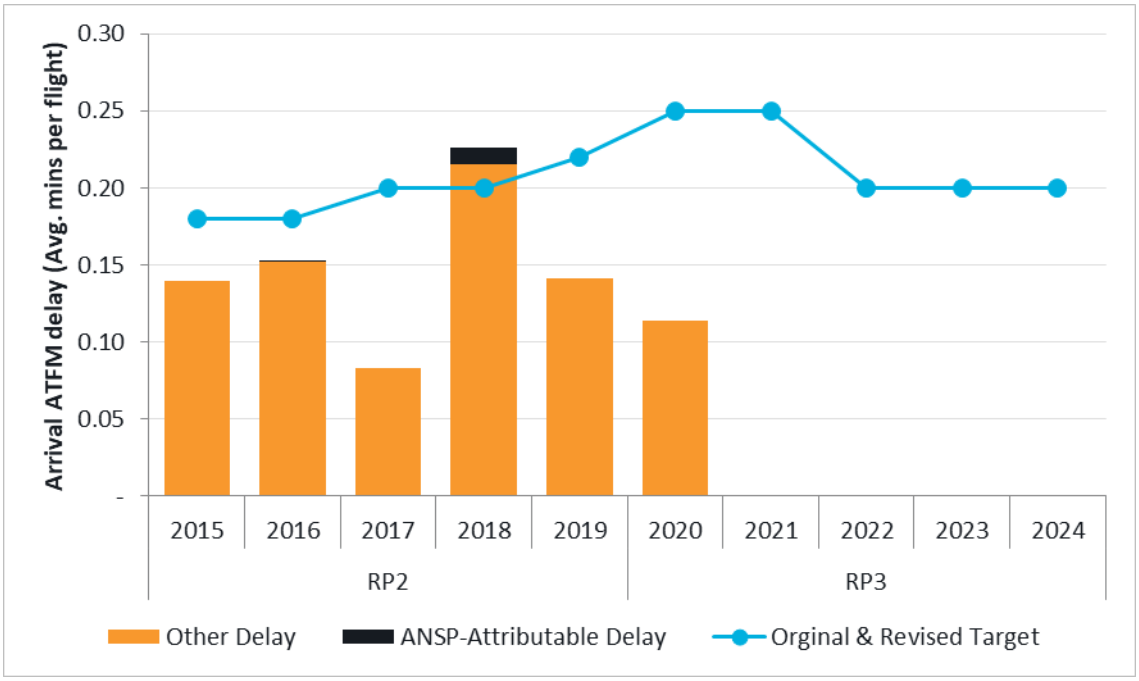
Figure 13.3: En Route Delay and Targets (RP2 and RP3)



Source: PRB assessment of RP3 performance plans (March 2020), Revised RP3 targets (June 2021) & Eurocontrol delay code data (post-op)

13.30 During RP2, the level of En Route delay in Ireland was very low, significantly below target. Based on the original RP3 delay forecasts, delay is projected to remain below target for the remaining years of RP3 (except in 2021), despite the delay target being reduced. Delay in 2020 was zero.

Figure 13.4: Arrival Delay and Targets (RP2 and RP3)



Source: PRB assessment of RP3 performance plans (March 2020) & Eurocontrol delay code data (post-op)

13.31 Arrival delay was closer to the target in RP2 (and above target in 2018), where a small proportion of this was ANSP-attributable. All arrival delay from 2015 to 2020 was at Dublin Airport and almost all was due to weather or aerodrome capacity; the small amount of ANSP-attributable delay was due to ATC equipment (NM code T).

13.32 Based on RP2 and 2020, the scope to reduce delays through providing incentives to the IAA ANSP is limited; En Route delay is already close to zero (although some is ANSP-attributable) and the ANSP has little control over the majority of arrival delay. Thus, our proposed incentive schemes are calibrated to disincentivise substantial increases in delay.

En Route Capacity Incentive - Pivot Value

13.33 Given that the level of ATFM delay was significantly below target in RP2, and this is projected to continue in RP3, it is not reasonable to use the default pivot value as this means the IAA ANSP is likely to achieve the level of delay below the bonus threshold with little or no performance change. The pivot value should therefore be modulated based on historic ANSP-attributable delay and be set at, or very close to, zero. We consider it appropriate to modulate the pivot value during RP3, should the level of ANSP-attributable delay increase materially.

En Route Capacity Incentive - Threshold

13.34 As specified within the regulation, the threshold should be +/-0.05 around the pivot value. If the pivot value is set to zero, this effectively means there is no threshold below the pivot value, as the concept of negative delay does not exist.

En Route Capacity Incentive - Deadband

13.35 While there is a less standardised approach in setting the deadband, a logical approach would be to set the deadband range such that penalty payments start to be paid at the point where the national delay target is exceeded. We are proposing to set the revised delay target at 0.03 from 2022 to 2024; the deadband could therefore be set at +/-0.03 around the pivot value in order for penalty payments to only be paid once delay is at or above the national target level, where the pivot value is modulated and set -0.03 below the delay target in each year.

13.36 As with the threshold, if the pivot value is set to zero, this effectively means there is no deadband below the pivot value.

En Route Capacity Incentive - Bonus and Penalty Payments

13.37 Given that the IAA ANSP has very low levels of delay, based on PRB guidance the incentive scheme should be a penalty only scheme with no bonus payments. Based on RP2 delay and projected RP3 delay, delay is projected to be consistently below the target (and default pivot value) level from 2022 to 2024, and it would not be reasonable to allow for the collection of bonuses when the target can be achieved with little or no behaviour change.

13.38 For maximum penalty payments, based on the original RP3 performance plans[43] across the SES, the majority of NSAs set maximum incentive scheme penalty payments of between 0.5% and 1%, with the highest penalty payment being set at 2%. Given the need to balance the requirement of a material impact on revenue without seeking to over-penalise and ensure that our financial analysis is not undermined, we see no reason to deviate from a maximum penalty of 1% (as in the previous PP).

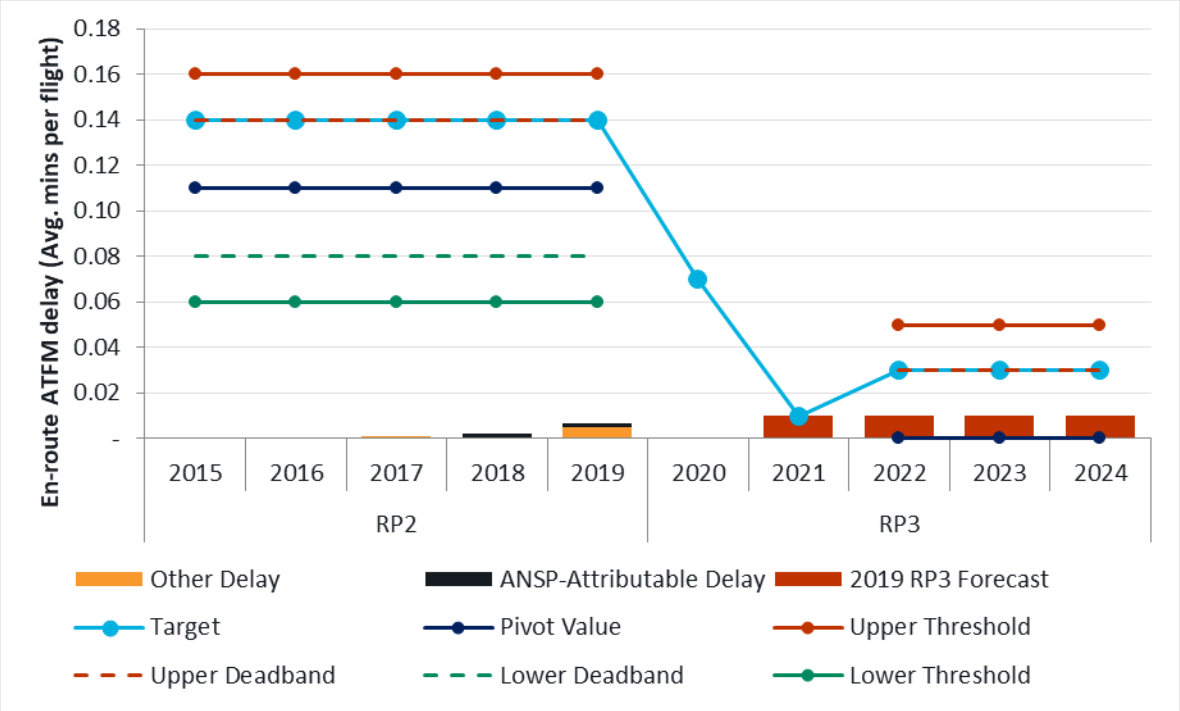
En Route Incentive Scheme - Summary

13.39 The En Route incentive scheme parameters are set in the context of Ireland having very low levels of delay. It is not possible to incentivise materially improved delay performance. However, it is possible to disincentive delay above this level given that, historically, a material amount of delay has been ANSP-attributable. Delay above the target level is a reasonable point for the ANSP to start paying penalties; the pivot value has therefore been modulated throughout the period in order to achieve this, given the requirement for the deadband and threshold to remain constant.

13.40 In summary, the IAA ANSP would begin to incur financial penalties if performance were to deteriorate beyond the annual target. If this does not occur, no penalties or bonuses would be applicable. Figure Figure13.5 shows the above incentive scheme parameters applied to the RP2 and revised RP3 delay targets. Note that the capacity incentive scheme will not apply in 2020 and 2021.

[43] PRB assessment of RP3 performance plans Union-wide assessment report (March 2020)

Figure 13.5: En Route Incentive Scheme Parameters



Source: PRB assessment of RP3 performance plans (March 2020) & Eurocontrol delay code data (post-op)

Table 13.2: Proposed En Route Incentive Scheme Parameters

Service	Parameters	Unit	2020	2021	2022	2023	2024
En Route	Target	Avg. mins delay	0.07	0.01	0.03	0.03	0.03
	Pivot value	Avg. mins delay	N/A		0	0	0
	Deadband	%			+/-0.03		
	Threshold	Avg. mins delay			+/-0.05		
	Max. bonus	% of DC			0%		
	Max. penalty	% of DC			1.0%		

Terminal Incentive Scheme

13.41 A depiction of the parameters discussed below is shown in Figure 13.6.

Terminal Incentive Scheme - Target

13.42 While the En Route capacity incentive scheme is based on the reference values associated with the union-wide ATFM delay target, no such union-wide targets exist for arrival ATFM delay and the terminal capacity and incentive schemes. Therefore, NSAs are required to set the terminal capacity target based on factors such as historical performance trends and comparison of performance with similar airports.

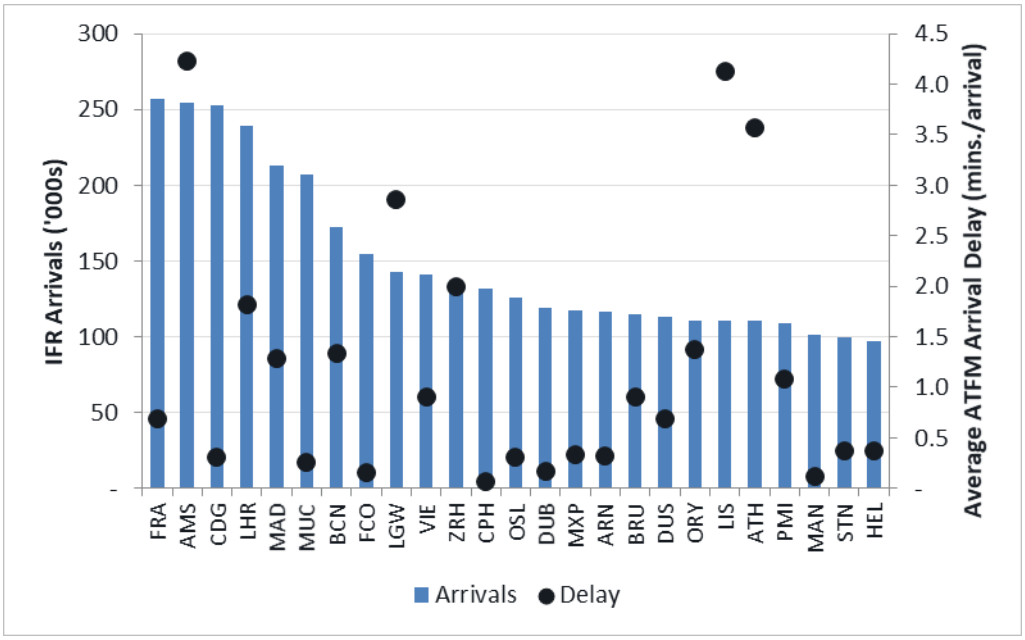
13.43 Within the original RP3 PP, the terminal capacity targets were set based on the level of delay in RP2. Almost all terminal delay in RP2 was due to adverse weather or aerodrome capacity, neither of which are ANSP-attributable – ANSP-attributable delay accounted for less than 2% of terminal delay in RP2 (with a maximum of 5% in a single year).

13.44 However, capacity targets are set based on total delay (not only ANSP-attributable delay) and the original RP3 terminal capacity target was therefore set at 0.25 minutes of arrival ATFM delay per flight in 2020 and 2021, and 0.2 minutes from 2022 to 2024 to account for the new runway at Dublin Airport. The new runway at Dublin airport was expected to reduce aerodrome capacity delays (and some weather delays), though some weather delay was still expected to remain.

13.45 In 2020, despite the significant reduction in the level of traffic, average minutes of ATFM arrival delay per flight at Dublin Airport have remained at a slightly lower though broadly consistent level compared with RP2, again due to a combination of weather and aerodrome capacity delays. On this evidence, we consider that the original RP3 terminal capacity targets remain reasonable.

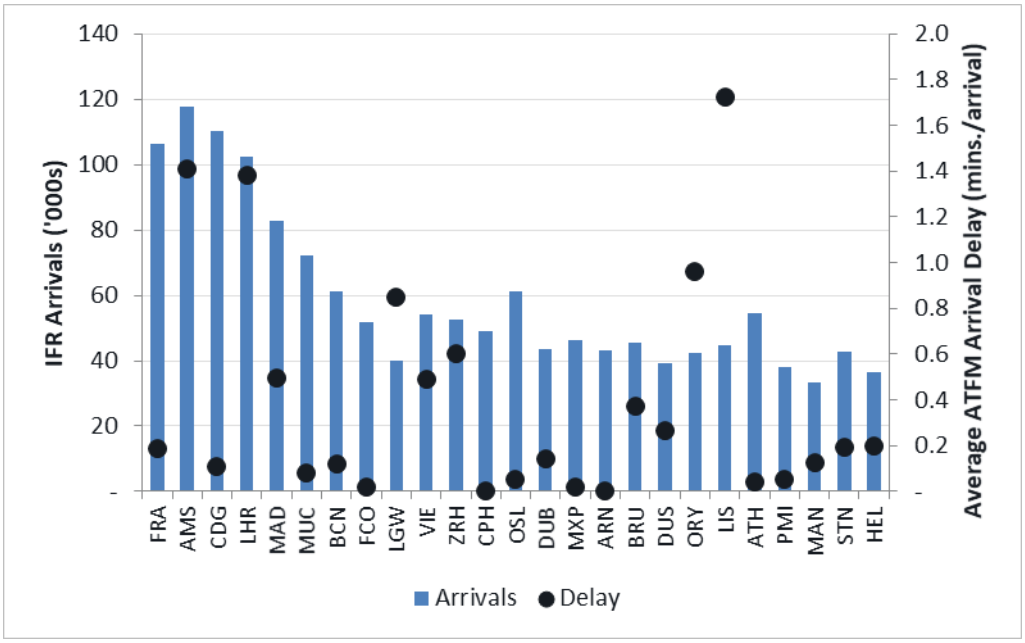
13.46 The average level of arrival delay at Dublin Airport, in both 2019 and 2020, was low when compared across other major European airports. This implies that the capacity targets set on the basis of this level of delay are low compared to other major European airports.

Figure 13.6: Comparator Airports Arrival Delay (2019)



Source: Eurocontrol delay code data (post-op)

Figure 13.7: Comparator Airports Arrival Delay (2020)



Source: Eurocontrol delay code data (post-op)

Terminal Incentive Scheme - Pivot Value

13.47 Arrival ATFM delay was below the target level in all but one year in RP2, however, unlike En Route ATFM delay, the level of delay was not close to zero. As set out above, all of Ireland's arrival delay in RP2 was at Dublin Airport and almost all delay was due to either weather or aerodrome capacity, both of which are largely outside of the IAA ANSP's control. Therefore, ANSP-attributable arrival delay was at or close to zero in RP2.

13.48 While the pivot value could be modulated based on ANSP-attributable delay in RP2, this would mean a pivot value of zero (or close to zero) and penalty payments in every year due to delay in excess of the threshold, which cannot be set at more than 50% above the pivot value. However, almost all of this delay would not have been ANSP-attributable and therefore the IAA ANSP would have been penalised for delay outside of its control. Therefore, the most simple and reasonable option would be to set the pivot value in line with the delay target.

Terminal Incentive Scheme - Threshold

13.49 As specified within the regulation, the threshold should be between 50% and 150% around the pivot value – equivalent to +/-50% around the pivot value.

Terminal Incentive Scheme - Deadband

13.50 In RP2, based on the proposed RP3 incentive scheme parameters, the IAA ANSP would have received a bonus payment in 2017 and, depending on the size of the deadband, bonus and penalty payments in all other years, despite not being responsible for the level of delay. With a pivot value set at the level of the delay target, given Ireland's experience in RP2, the deadband should be set as wide as possible to avoid, as much as possible, the ANSP receiving bonuses or penalties based on delay which is largely

out of its control.

Terminal Incentive Scheme - Bonus and Penalty Payments

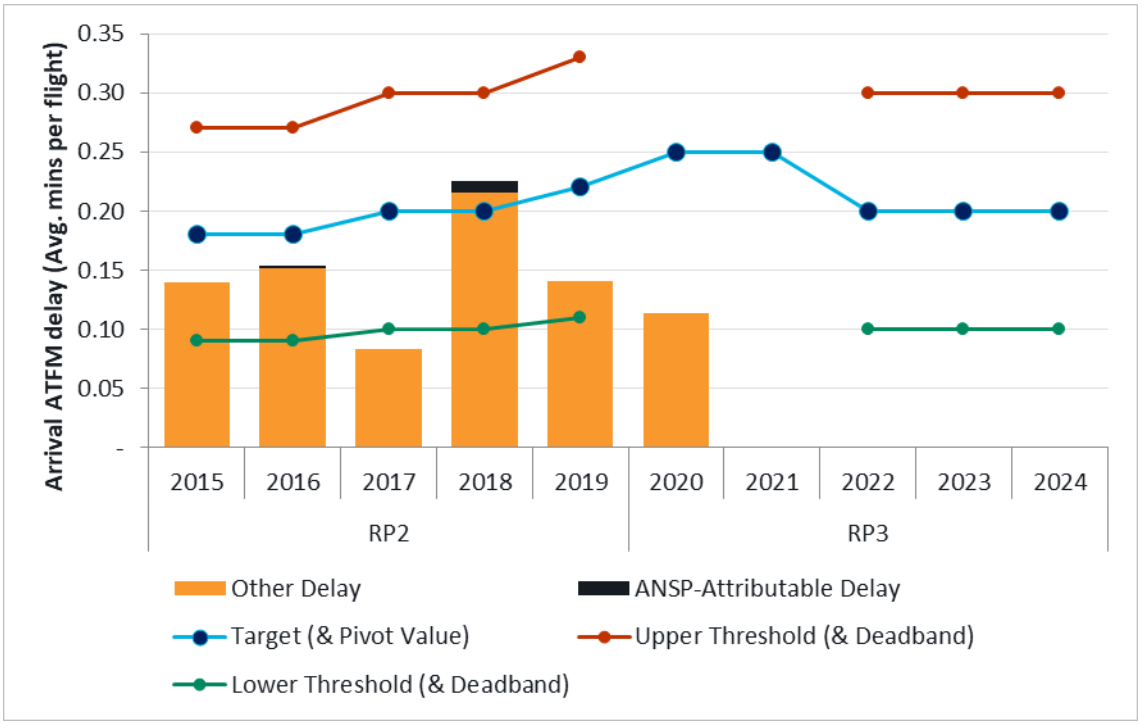
13.51 Given that the delay is largely outside the control of the IAA ANSP, it is not reasonable for it to receive bonus payments for delay below the level of the lower threshold; the maximum bonus payment should therefore be set at zero. Likewise, it is not reasonable for the ANSP to receive penalty payments for delay above the level of the upper threshold; however, a small financial penalty is required for a functioning incentive scheme. The penalty payment should therefore be set at 0.5%, to reflect the low level of ANSP-attributable delay but provide some incentive to keep this at a low level.

Terminal Incentive Scheme - Summary

13.52 The terminal incentive scheme parameters should be set in the context of the ANSP having little control of the vast majority (c.98%) of arrival ATFM delay and the payments being minimised order to avoid, as much as possible, being rewarded or penalised for things that are largely not within its control. While the pivot value can be modulated based on ANSP-attributable delay, the deadband and threshold are based on all delay causes; it is therefore not possible to implement an ANSP-attributable delay incentive scheme, which would be more appropriate in this case.

13.53 Figure 13.6 shows the above incentive scheme parameters applied to the RP2 and original RP3 delay targets. Note that the capacity incentive scheme will not apply in 2020 and 2021.

Figure 13.6: RP3 Terminal Incentive Scheme Parameters



Source: PRB assessment of RP3 performance plans (March 2020) & Eurocontrol delay code data (post-op)

Table 13.2: Proposed Terminal Incentive Scheme Parameters

Service	Parameters	Unit	2020	2021	2022	2023	2024
Terminal	Target	Avg. mins delay	0.25	0.25	0.2	0.2	0.2
	Pivot value	Avg. mins delay	N/A		0.2	0.2	0.2
	Deadband	%			+/-50%		
	Threshold	Avg. mins delay			+/-50%		
	Max. bonus	% of DC			-		
	Max. penalty	% of DC			0.5%		

14. Appendix 1: Individual Project Summaries

14.1 This section provides an overview of the individual projects we propose to provide for within the Performance Plan. For 2 projects, the IAA ANSP has asked us to maintain the confidentiality of the project, for reasons we have accepted. These projects are therefore not included in this appendix. Neither of these projects would be considered 'major projects' within the meaning of Regulation 317/2019, that is projects exceeding €5m. Major projects are identified as such below.

14.2 A summary table of the IAA ANSP cost proposals and asset lives, as well as the NSA proposed asset lives, is included at the end of this section. As described in Section 6, in a number of cases we are proposing to adjust asset life assumptions where we consider that the IAA ANSP proposal does not represent a centreline estimate of the expected operating life. These cases, most of them Appendix 1 projects, are identified below. In some cases, we have aligned the asset lives in the asset register with those stated in the Business Plan, where we consider those to be reasonable.

14.3 As project costs have been included in nominal prices, there is no double counting between the general inflation adjustments and the escalation allowances provided for in certain project costings.

Appendix 1- Property and Security Projects

14.4 All projects in this section have been costed by a Quantity Surveyor (QS). In response to our request, cost build-ups were provided, most of which were at a level of detail commensurate with what we would expect given the projects have not yet reached detailed design.

14.5 Contingency and escalation assumptions are somewhat higher than we would expect, notwithstanding that the projects have not yet reached detailed design phase. In particular, they appear to pre-date the April 2021 SCSI construction price index publication, which identified a COVID-19 related sharp reduction in construction price inflation from 5%-6% to 2%.[44]

Conditional Survey Works (RP3.PROP.1) – Proposed cost €3,059,700

14.6 This project is essentially structural, external roofs/walls, and M&E maintenance at 13 different central and remote sites. It includes costs (25% of the total) associated with a range of small sites (stated to be on average 40+ years old), as well as more substantial works at Mount Gabriel, Shannon ATCC, and Ballycasey ATCC for which substantial detail on the specific issues to be addressed has been provided. Ballygireen costs have been excluded as it is not part of the regulated entity and supplementals have been apportioned accordingly.

14.7 We would expect the useful life of works of this nature to be in the region of 20 years rather than the 10 years stated in the business plan and propose to adjust the asset life accordingly.

[44] https://mk0societyofchag3d3v.kinstacdn.com/wp-content/uploads/2021/04/SCSI-Tender-Price-Index-April-2021-final.pdf

Fire Suppression System (U015A) – Proposed cost €697,500

14.8 This project will replace end-of-life fire suppression systems and also provide for the installation of new fire suppression systems and associated electrical/civil works at remote IAA facilities. The existing installations date from 2006 which is consistent with them reaching end of useful life at circa 2021. For the new sites, the project will enhance the safety facilities for people and aviation infrastructure.

14.9 We would expect the useful life of works of this nature to be in the region of 15 years rather than the 10 years stated in the business plan and propose to adjust the assumed asset life accordingly.

Plant Upgrade Works (U015A) – Proposed cost €7,168,750

14.10 This is a major M&E asset care project allowance (including associated civil works) at 15 IAA facilities. The QS has provided outline specifications for the various sites, with more specific detail provided in relation to the more costly sites. The project predominantly relates to HVAC[45], chillers & pumps, and Building Management System works. We noted that the costing does not include the replacement of all the referenced plant as there is an anticipation that certain plant items will be capable of life extension through repairs instead, to be identified at the detailed site assessment phase.

14.11 We note that a separate allocation has been made to NAC related works, and the supplementals pro-rated accordingly.

14.12 We would expect the useful life of works of this nature to be in the region of 15 years rather than the 10 years stated in the business plan and propose to adjust the assumed asset life accordingly.

Cork ATC Building Extension – Proposed cost €2,325,000

14.13 This is a project to extend the size of the Cork ATC tower building by 225 sqm to provide for offices, storerooms, meeting rooms, and rest facilities. In relation to rest facilities, the IAA ANSP references EU Regulation 2017/373 fatigue management requirements. As requested, they have provided a CAD drawing which shows that there is already a rest facility, although the new layout would provide a substantially larger space. The immediate requirement for this project is not yet fully convincing, particularly in the current circumstances, however as discussed in Section 6 we propose to make a programme level adjustment which allows the IAA ANSP to progress a project such as this if it is warranted.

14.14 The proposed asset life of 25 years is reasonable.

Structural Upgrade works – Proposed cost €2,092,500

14.15 This project is described as an 'assessment of structures and identification of issues, progress and implement technical solution with minimal impact on operations. Final scope all subject to detailed survey/assessment.' Thus, it is high level and non-specific

[45] Heating, Ventilation, and Air Conditioning

in terms of what actual construction works would be carried out. Within the scope of the Performance Plan, it includes Shannon Tower (50+ years old), Dublin ACC (35 years), and Ballycasey (20 years). The report on this project also states that there has been little expenditure on structural assessments or upgrade works to these facilities over their lifespan. On that basis it can be expected that some structural maintenance would be required.

14.16 The proposed asset life is 25 years. This is somewhat longer than we would expect for maintenance works of this nature. Thus we propose to reduce the assumed asset life to 20 years.

Dublin ACC Building works – Proposed cost €1,162,500

14.17 This is a project with 3 distinct elements with costs broadly evenly split: replacement of the rear building roof light, replacement of the dilapidated glass curtain wall and the installation of an external fire escape ladder from the existing air traffic control cab. The report on this project notes that the roof light is 20 years old and suffering from decay and water ingress, and that repair is uneconomical. The rooflight is adjacent to operational and equipment rooms. The curtain wall is 35 years old and out of production with no replacement parts available. The fire escape is for the old tower at DUB, which will be used for training and as a contingency tower.

14.18 The asset life for this project is given as 25 years in the original Business Plan but is given as 15 years in the revised Business Plan. We believe that the originally proposed asset life of 25 years is reasonable.

New Dublin Radar Building – Proposed cost €3,600,000

14.19 This is a project to construct a new off-airfield radar building to service Dublin Airport operations. The ANSP has noted that primary driver for this project is to ensure consistent 3NM separations in the Dublin Airport TMA, avoiding reversions to 5NM. This project is necessary to facilitate the 'New Dublin Radar 2 Replacement' project discussed below.

14.20 The proposed asset life for the new building, as stated in the BP, is 20 years. For a new build of this nature, this is considerably shorter than we would expect in terms of the likely operational life. On that basis, we propose to extend the asset life to 40 years, in line with other new-build RP3 projects.

Energy Management Upgrade Works – Proposed cost €3,600,000

14.21 The purpose of this project is to provide for a number of energy upgrade works on IAA ANSP assets, in line with the Government's commitment for public bodies to achieve a 33% reduction in energy usage, under SI 426 of 2014. This presents a challenge to the ANSP due to the planned introduction of new Centres/facilities such as the Dublin tower and CEROC.

14.22 The project includes elements ranging from plant, LED fittings, photovoltaic panels, and other projects intended to deliver energy efficiencies.

14.23 The asset life for this project is given as 10-15 years in the original Business Plan but

appears to be <10 years in the revised Business Plan. We agree with the original asset life of 15 years, rather than the revised asset life of <10 years.

Replacement of Building and Equipment Cooling System – Proposed cost €850,000

14.24 The purpose of this project is to replace the three internal and two external air-handling units at Dublin ACC, which the ANSP states are at End of Life and require replacement and reconditioning, with this having been recommended through a conditional survey by a contractor. The ANSP points out that continuing faults with the system pose a significant risk to the IAA Operations Centre, Technical Control Areas, and Equipment rooms, as this would result in insufficient cooling and temperature control for Operational personnel and equipment. However, specific evidence of these faults has not been provided, although as this project was not included in the original draft of the revised Business Plan, we have not had time to fully assess this project.

Temperature Checking Equipment – Proposed cost €220,000

14.25 The purpose of this minor project is to provide fixed automated temperature checking cameras and associated systems into each IAA ANSP Centre at the relevant points of access, as a means of identifying COVID-19 in people entering the building. Thus, it is a COVID-19 preventative measure, important for both the personnel working in these centres, and also the continuity of service provision through reduced risk of outbreaks.

14.26 The asset life for this project is given as 10-15 years in the original Business Plan but appears to be <10 years in the revised Business Plan. We agree with the original asset life of 15 years, rather than the revised asset life of <10 years.

Climate Action Plan (Sustainability Management Plan) – Proposed cost €5,000,000

14.27 The purpose of this project, budgeted at €5m, is to commence a number of projects (and continue several already underway) aimed at helping the IAA achieve its aim of becoming carbon neutral in their use of energy, and enhance sustainability. These are expected to include projects such as:

- Electric vehicles and charging infrastructure
- Photovoltaic farm
- Building insulation and HVAC works

14.28 The asset life is given as 10-20 years in the Business Plan but appears to be 5 years in the asset register. This has been corrected to 15 years in the NSA model, as the midpoint of the Business Plan proposal.

Essential Building Upgrade Works at Mt. Gabriel – Proposed cost €775,000

14.29 The purpose of this project is to provide upgrade works to the Mt. Gabriel radar station, including upgrades of the existing building structures, finishes, lighting, emergency lighting, fire safety and essential external siteworks.

14.30 The ANSP has stated that much of the site has reached end of life, therefore necessitating upgrades. Specific evidence of these faults has not been provided, and as this project was not included in the original draft of the revised Business Plan, we

have not had sufficient time to comprehensively review the project.

Appendix 2: ICT

14.31 This Appendix contains one project: *2022-2024 ICT Infrastructure Life Cycle Management and Compliance – Proposed cost €3,300,000*

14.32 This is a project to cover ICT Capex over 2022-2024 relating to mainly cybersecurity and life-cycle replacement for PCs, laptops, ICT servers, and printers. PCs are replaced every 5 years, laptops every 3. We note that this level of IT Capex over 2022-2024 would be below ICT spend over RP2, with €1.1m per year forecast over 2022-2024 . On that basis the proposed level of ICT expenditure would appear reasonable. The Business Plan identifies this saving as having been driven by cost saving efforts due to COVID-19.

Appendix 3- Network and Security

Edison Core – Proposed cost €1,020,000

14.33 This project proposes to improve connectivity at the ATC Centres in Ballycasey and Dublin through migrating from existing TDM Backbone system to a higher speed IP enabled platform. The project is complemented by two others, the 'IP Network Rollout' project and the 'Upgrades to Cable Ducting at Remote Sites' project. The Edison Core provides the IP equipment at each of the 3 main centres, Ballycasey, Dublin, and CEROC. The IP roll out provides the IP access network to IAA remote sites, and the ducting and cabling project enables fibre connectivity to remote sites where fibre routes and ducting was not available.

14.34 We note that the existing network infrastructure is 20 years old and no longer supported by the vendor. We also noted that the cost build-up provided appears to sum to about €250k below the total value provided.

IP Network Rollout – Proposed cost €1,020,000

14.35 This project replaced existing IAA Backbone Network Multiplexers with new IP Hybrid Multiplexers. The business plan states that the multiplexers reaching end of life as the primary driver of the project, and also notes that the existing equipment was TDM technology and is not IP capable. The new multiplexers are intended to carry the IAA's current legacy data and voice feeds, along with new IP services such as Remote Tower and Centralised Monitoring, to facilitate future service requirements. This project went live in December 2020.

Upgrades to Cable Ducting at Remote Sites – Proposed cost €500,000

14.36 This project seeks to replace the cable ducting at IAA ANSP remote sites. We note that the existing cable ducting was installed in the 1960’s. A further justification given is that the IAA is building out a fibre network to the remote sites and the current ducting is stated to be unable to support these fibre rollouts.

14.37 The proposed lifespan of these assets is 8 years. This is considerably shorter than what we would expect for assets of this nature (noting also that the existing ducting has remained operational since the 1960s). We therefore propose an asset life of 20 years.

ERIN TDM-IP Network Migration Project – Proposed cost €300,000

14.38 This minor project was established in response to Vodafone's decision to end their provision of E1 product services to the IAA & NATS. The purpose of this project is to acquire and test new E1 circuits, as well as to seek safety approval, and to implement the new technology. The key driver for this project is business continuity.

System Resilience NIS Compliance NIS Directive – Proposed cost €1,200,000

14.39 The IAA ANSP is planning to develop its Information Security Management Systems in line with new EU requirements (The NIS Directive (EU) 2016/1148). The precise detail of these requirements has not yet been defined but is expected by the IAA ANSP to require investment in segmented systems, networks, and equipment. Responses to all questions were provided, however, information requested on the specific cost assumptions and calculation methodologies for this project was not available, given that the required scope of the project is not defined, but rather is based on high level assumptions as to what will be required.

14.40 This project is mandated by changes to EU legislation and so the BP demonstrates the need for security management systems that meet these standards. However, the degree to which current systems differ from expected systems is not yet known as they have not yet been fully identified by EASA. Therefore, the level of system upgrades needed to ensure compliance with new requirements is unclear.

CYBERSECURITY NIS Directive – Proposed cost €750,000

14.41 The IAA's ANSP is proposing to develop their capability around 'ATM System Identification and Protection', whilst improving their ability to Detect, Respond and Recover their systems in the event of a Cyber Event/Attack. This project is again motivated by the NIS Directive (EU) 2016/1148.

14.42 Again, specific cost assumptions and calculation methodologies requested by the NSA were not available, given the absence of the specific system requirement details. This project is mandated by changes to EU legislation and the Business Plan has demonstrated the need for systems that meet these standards. A security management system is a system of processes, documents, technology, and people that help to manage, monitor, audit, and improve an organisation's information security.

Appendix 3- FDP and Comms

Test Equipment for Navigational Aid Systems – Proposed cost €300,000

14.43 The purpose of this minor project is to purchase new test equipment used in the maintenance of Navaids such as the Instrument Landing Systems (ILS). The ANSP states that existing test equipment has been in operation for over 20 years and needs to be replaced at all three state airports to ensure and efficient En Route and terminal ATC services. We understand that the equipment is purchased, or orders have been placed.

PABX Infrastructure Upgrade Ballycasey – Proposed cost €100,000

14.44 This minor project proposes to replace the existing Ballycasey Centre PABX with a new

system and to install a Software and Firmware upgrade on the Cork Tower PABX, to facilitate continued voice connectivity between the ANSP, Ballycasey ATCC, and other adjacent ATCCs and Airports. Safety and obsolescence are cited as the drivers of this project as the Ballycasey PABX is currently 18 years old and is stated to have reached End of Life (EOL) status. We note that PABX vendor no longer supplies this system and are providing support on a best endeavour basis only. The Cork PABX is currently 13 years old and although still operational and supported by the supplier, is stated to need minor upgrades to prolong its life. A vendor quote has been provided to the NSA.

PABX Infrastructure Upgrade – Proposed cost €80,000

14.45 This minor project proposes to replace the existing Dublin Air Traffic Control Centre PABX with a new PABX, as part of the new Dublin Airport tower project.

Airfield Cabling Replacement – Proposed cost €2,000,000

14.46 The purpose of this project is to upgrade the Shannon, Dublin and Cork airfield cables, elements of which have been in service for over 40 years. The IAA ANSP notes that existing cables provide services which are important to business continuity and aircraft safety and that the loss of service due to the age of the cables could lead to traffic disruption. The Business Plan also notes that this project will also add diversity on cable routes at Shannon and Dublin airport. As the Cork airfield cabling was upgraded in 2008/2009, the IAA ANSP is requesting a smaller upgrade for this location, with the aim of improving resilience. Consequently, the need for this project is clear. Available cost detail is high level only.

14.47 The proposed lifespan of these assets is 8 years. This is considerably shorter than what we would expect for assets of this nature. We therefore propose an asset life of 20 years.

Integrated Met Server – Proposed cost €1,800,000

14.48 The aim of this project is to ensure the availability of accurate Local Airport Weather information by upgrading the existing METREP function in COOPANS. The project also proposes to replace the existing ATIS systems at Shannon, Dublin, and Cork with a system that is ICAO compliant in relation to the broadcast of runway status. This project is linked to the AMAP project being delivered by MET ASD, described in Section 7, thus is also required to deliver the cost efficiency savings assumed by MET ASD. The contract for this project has been agreed.

Radio Frequency Interference Hunting Upgrade – Proposed cost €100,000

14.49 The purpose of this project is to assist the ANSP ensure the integrity of CNS systems and to protect them against unlawful interference. A key motivator this project is the recent changes to the radio frequency environment such as mobile phone technology (5G), which the ANSP notes has the potential to interfere with its services. Procuring this upgrade is intended to assist the ANSP in tracking the source of any unwanted interference with CNS systems and to ensure a quick resolution. A detailed set of cost material has been provided to the NSA.

Migration of FMTP from IPv4 to IPv6 – Proposed cost €100,000

14.50 The purpose of this minor project is to enhance the existing COOPANS and IAA networks to facilitate the migration from IPv4 to IPv6. The Business Plan notes that all ANSPs are mandated by the EC to implement the new system, and states that it will offer "increased addressing options, improved management of real time data services and enhanced security". This upgrade was mandated by an EC regulation (Regulation (EC) No 633/2007 as amended by Regulation (EU) No 283/2011) from 2014 and so there is a present need for this project. Costs have been calculated based on market prices, references to which were provided to the NSA.

Upgrades & Contingency IAA NET – Proposed cost €200,000

14.51 The purpose of this minor project is to replace the hardware and the associated software in the routers, switches, firewalls, and network monitoring workstations for the IAA-NET network. The IAA ANSP states that the network (which is used for internal/external distribution of operational data) is critical to ATM operations and is now obsolete. Again, costs have been calculated based on market prices, references to which were provided to the NSA.

VHF Replacement Programme – Proposed cost €1,800,000

14.52 VHF / UHF communication is the primary method of communication with aircraft for ATC Services. The purpose of this project is to replace existing VHF / UHF Radio equipment at the Dublin, Cork, Ballycasey, Shannon Tower, and CEROC sites with IP based VHF/UHF Radio infrastructure with the stated aim of addressing the obsolescence of the communications infrastructure, as well as facilitating the roll out of next generation ATC IP Voice Communications Systems. The IAA ANSP has demonstrated a need for this project on the basis that the current systems are obsolete, that next generation voice communications systems cannot be rolled out using the current equipment and that due to age this equipment has limited vendor support.

14.53 Substantial cost information has been provided to the NSA.

Frequency Expansion Programme – Proposed cost €500,000

14.54 The purpose of this minor project is to upgrade the IAA ANSPs Voice Communications infrastructure (transmitter/Receiver sites, additional transmitters/receivers, masts, etc.), with the stated aim of improving and extending coverage in specific regions to meet regulatory requirements. The IAA ANSP aims to accomplish this by enhancing the coverage of VHF radio services at new geographical locations and adding additional frequencies at Dublin and Shannon Airports to facilitate National Aeronautical events.

Tower Training Simulator – Proposed cost €1,000,000

14.55 The purpose of this project is to purchase, install, and commission a new tower simulator at Dublin to support training for the I-ATS System (including Electronic Flight Strips, Collaborative Decision Making, Departure clearance, and surface movement radar display). The IAA ANSP states that the current arrangement of using the same rig

for both training and validation is no longer sustainable now that the I-ATS/EFS is operational.

14.56 In response to the question of how the required training can be provided until the new rig is operational (in 2024), the ANSP state that the current simulator can provide 'basic' training requirements until then. The current need for this project, at this time, is therefore not fully demonstrated. Furthermore, the ANSP were able to provide only limited details on the cost of previous simulator purchases.

IAA Smartmessenger (AFTN/AMHS) System Enhancements and ROFDS Contingency – Proposed cost €500,000

14.57 The purpose of this project is to upgrade the ANSPs AFTN/AMHS communications equipment which the IAA ANSP states is now obsolete. AFTN/AMHS communications equipment is necessary for the provision of ATM services in Irish controlled airspace. This project proposes both hardware and software upgrades, and to improve the ANSP's ability to handle IWXXM messages, as there is also an ICAO mandate to support the delivery of IWXXM messages to MET Eireann. This is defined in Annex 3 to the Convention on International Civil Aviation, *Meteorological Service for International Air Navigation*.

14.58 We note however that little specific evidence of equipment obsolescence or cost detail was available.

Emergency Air Situation Display System (EASDS) Replacement – Proposed cost €6,500,000

14.59 The purpose of this major project is to replace the current Emergency Air Situation Display System (EASDS) which was introduced into operational service in 2008. The EASDS is used as a contingency ATC system in the event of a major failure of the COOPANS system. The existing system is stated to be at a replacement age, which is reasonable given that it has been in service since 2008. It is also argued that the existing EASDS system has very little in built redundancy and IAA Operational requirements have changed since it was first deployed.

14.60 The cost information available for this project has been limited to Rough Order of Magnitude (ROM) level, with the IAA ANSP stating that it will shortly go to market at which point more granular costs will available.

New Voice Communications Switch – Proposed cost €4,500,000

14.61 The purpose of this project is to replace the VCS systems at Cork, Ballycasey and Shannon tower along with the associated professional services required to commission all three systems. A VCS is a set of equipment enabling its users (air traffic controllers and support staff) to initiate, receive, attend to, and maintain communication over radio or telephone. The potential that the systems may become unsupported, details of which have been provided to the NSA, is noted. This project will be delivered in co-ordination with the VCS installations at Dublin Airport under project R035 (New Tower Parallel Runway). We have been provided with detailed costings, as the contract is already in place to provide this project.

Navaids Replacement Program – Proposed cost €9,000,000

14.62 The purpose of this major project is to replace the existing Instrument Landing System (ILS) and Instrument Runway Visual Range (IRVR) systems at the three state airports Dublin, Shannon, and Cork.

14.63 The IAA ANSP states that the current ILS and IRVR systems are reaching end of life having been installed between 2004 and 2007 and that some components of the systems are obsolete. This is reasonable, on the basis that the systems have been in place for 14-17 years. Detailed costings were provided, however, relatively little detail was available regarding the specific condition of the assets due for replacement, though as noted above the age of the assets suggests that replacing them during RP3 is reasonable.

14.64 The asset life of 12 years, as stated in the BP, is reasonable and has been reflected in our calculations.

Appendix 3- COOPANS

14.65 COOPANS is a partnership between the IAA ANSP and four other ANSPs, as well as the ATM systems supplier, Thales, for the delivery of ATM systems and functionality intended to steadily enhance safety and productivity. This allows for economies of scale and common ATM systems, as 'builds', or packages of functionality, are agreed by the COOPANS Board. Thales offer quotations and negotiation takes place at the COOPANS partner level. The apportionment of cost is usually equally shared by each partner. The partners do not opt-in/out on individual builds but have agreed to collectively implement all the builds. A request for specific estimates on the impact on the 4 KPAs was issued, but this was stated to not be readily available. However, it should be noted that Steer does anticipate enhanced ATCO productivity in its Opex forecasts.

14.66 Overall, this approach to developing ATM systems is aligned with SES principles and has been recognised by the EC.[46]

COOPANS Builds 3.6 to 3.8 Budget – Proposed cost €8,000,000

14.67 These 6 builds, split between RP2 and RP3, include features such as the addition of FAST DBS (Final Approach Spacing Tool Distance Based Separation), Safety Nets enhancements. It is also noted that this set of builds was originally budgeted at a higher level than the outturn amount (which is what we have reflected in our cost proposals).

COOPANS 2019 Roadmap Builds – Proposed cost €8,000,000

14.68 This project provides for the next round of COOPANS builds intended to provide further functionalities to the ATM systems to enhance efficiency and safety. Most of the expenditure (€6m) is anticipated to be capitalised in RP4, with expenditure split approximately 50/50 between RP3 and RP4. No further cost detail was available (the detailed scope of the build is not yet defined); rather the cost proposal is based on an

[46] https://ec.europa.eu/transport/modes/air/ses/ses-award-2016/projects/coopans-alliance_ro

anticipation of the continuation of the historic pattern of expenditure.

Replacement of COOPANS Hardware – Proposed cost €3,000,000

14.69 This project replaces COOPANS hardware (controller position workstations, servers, network equipment). The hardware is aligned with COOPANS specifications as agreed by the partnership. Almost all of this project is already complete, and costs are firm.

Appendix 3- Surveillance and M&E

ARTAS & SASS-C Upgrades – Proposed cost €500,000

14.70 The purpose of this project is to upgrade the Surveillance Data Tracking systems (ARTAS) and Surveillance performance validation systems (SASS-C) in Dublin, Ballycasey, and CEROC to the supported Eurocontrol release versions, during the RP3 period. This project will involve both hardware and software upgrades, although the ANSP will only be required to provide the hardware costs. The key benefit of this project is that these systems will be fully supported, ensuring timely assistance in the event of issues.

14.71 As well as demonstrating the need for this project, the IAA ANSP has provided significant cost detail for the ARTAS upgrades, although less detail was available in relation to SASS-C costs.

ASMGCS Enhancements – Proposed cost €400,000

14.72 The purpose of this minor project is to provide a number of specific enhancements to the Dublin Airport Advanced Surface Movement Guidance and Control System (ASMGCS), to address a number of issues identified with the functionality of the current system.

14.73 We note that the cost proposal is slightly higher than would be appear to be supported by the detail provided.

ATC Screen Replacement – Proposed cost €1,500,000

14.74 The purpose of this project is to replace the ATC screens in the Dublin and Ballycasey ATCCs that were installed in 2007 and upgraded with LED backlights in 2016. These screens are stated to be at the end of their useful lives, which is reasonable given their age. The ANSP proposes to replace 111 screens in total.

14.75 Detail underpinning the cost proposal was high level only.

BMS Upgrade Dublin and Ballycasey ATCCs – Proposed cost €500,000

14.76 The purpose of this project is to upgrade the Building Management Systems (BMS) in the Dublin and Ballycasey ATCCs, which the IAA ANSP states are at end of life, which is reasonable given that the existing infrastructure is 18/19 years old.

New En Route Contingency Centre at Ballygirreen – Proposed cost €12,255,483

14.77 The purpose of this major project is to build and fit out a new En Route contingency centre at Ballygirreen. The project is complete and was capitalised in 2020, thus the cost is based on outturns. The facility is intended to provide up to 100% of the capacity of the Ballycasey centre under single person operation conditions. From an operational perspective, ATCOs will use similar procedures and equipment as in normal operations at Ballycasey ACC. As noted by the IAA ANSP, this project will enhance contingency and resilience of the provision of air traffic services, ensuring that En Route capacity targets can be met even in the event of a severe incident at the Ballycasey centre.

14.78 The proposed asset life of the core construction line item is 20 years. This is considerably shorter than we would expect for a major new operational centre which we would expect to remain in service for the foreseeable future. From an airport perspective, we have previously assumed an asset life of 50 years for a terminal building, and 40 years for the construction element of a new pier. We therefore propose to adjust the asset life of the construction works to 40 years, in line with a new pier. The asset lives for other elements of the project are reasonable.

New Dublin Radar 2 Replacement – Proposed cost €5,000,000

14.79 The purpose of this project is to replace Dublin RADAR 2 which is stated to be at end of life, and also to deliver a second RADAR at an off-airfield site. RADAR 2 is 27 years old, thus this is reasonable. The first of these RADARs has already been delivered.

14.80 This project aims to ensure that Dublin ATC has sufficient, reliable, and accurate surveillance coverage of the Dublin Airspace in order to maintain 3NM horizontal separation of Aircraft. The reduced risk of aircraft delays arising from a potential failure of the existing RADAR, and a consequent requirement to revert to 5 NM separations, is the key benefit of this project. Detailed cost build-ups were provided.

14.81 We have identified that the proposed 12-year asset life is somewhat shorter than would be expected for a Mode-S RADAR. Thus, we propose an asset life of 15 years.

National Generator Replacements – Proposed cost €375,000

14.82 The purpose of this project is to improve power supply resilience to the NAC centre and key radar and VHF Communication sites by replacing five existing generators and adding two new ones. We have verified that the NAC element of this project has not been apportioned to the terminal or En Route cost bases.

National Radar Upgrades – Proposed cost €4,000,000

14.83 The purpose of this project is to upgrade the eight RADARs that were installed between 2005 and 2011 to expand their working lives by five years. Given the age of the RADARs, this is reasonable, and more specific details have been provided to the NSA. This project aims to ensure that the IAA ANSP will have sufficient, reliable, and accurate surveillance coverage of the Irish Airspace in order to maintain 5NM (Nautical Mile) and 3NM horizontal separation of Aircraft, in the En Route and Dublin Terminal airspace respectively. In order to reduce cost, full Radar replacement during the RP3 period was not proposed.

PSR 2.6GHz Safeguarding – Proposed cost €920,000

14.84 The purpose of this project is to provide upgrades to ensure that the ANSP's Primary Radars (PSR) are not impacted by use of the 2.6GHz band for mobile telephony, and to ensure that safety standards are maintained. This project will involve installing filters and making radio frequency changes to all PSR Radars to ensure compatibility with mobile communications utilizing the 2.6 GHz band to prevent Radar interference. This project covers the Primary Radars at Dublin, Cork, and Shannon airports.

14.85 Cost details have been provided; however, it is anticipated that these costs will be reimbursed by the Irish government. In that case, we expect to claw back this allowance as part of the RP4 Performance Plan, or alternatively the IAA ANSP can make use of the flexibility we provide for in the Capex allowances to reallocate this allowance.

Radar Site UPS Replacement – Proposed cost €525,000

14.86 The purpose of this project, which is now complete, was to replace the obsolete Uninterruptible Power Supply (UPS) systems at the radar sites and Shannon Tower (which were obsolete) with dual redundant UPS systems with additional battery backup to improve Radar availability and resilience to mains power failures. The UPS systems at 8 different sites were replaced; we note that the outturn cost was below the level originally estimated.

Remote Power Management – Proposed cost €400,000

14.87 The purpose of this project is to install a system capable of the independent remote power monitoring of up to 20 sites, to provide detailed and unambiguous logging and reporting of power related faults at remote sites. The remote power monitoring will enable the relevant TCD to know where in the power chain a fault has occurred, allowing for the correct support services, mains supplier, UPS or Generator contractors, to be contacted. However, detail on cost calculations underpinning this was limited.

Shannon Tower Generator Replacement – Proposed cost €115,000

14.88 The purpose of this project is to replace the two 46-year-old generators supporting the Shannon Control tower and the systems and services transiting through the Shannon Tower to the En Route centre in Ballycasey. This is reasonable, given the age of the generators. Cost information is high level only.

Terrestrial ADS-B – Proposed cost €500,000

14.89 The purpose of this project is for the ANSP to improve their surveillance infrastructure by adding Automatic Dependant Surveillance – Broadcast (ADS-B) sensors to their Radar sensor coverage. The ANSP notes that ADS-B has the potential to deliver surveillance data which is more accurate and cost effective compared to Radar, with benefits for each of the KPAs.

14.90 This project has already been completed and so the costs associated with this project

are final costs, these final costs were very similar to the originally projected cost.

Dublin and Ballycasey ATCC UPS Replacements – Proposed cost €270,000

14.91 The purpose of this project is to replace the Dublin and Shannon Air Traffic Control Centre (ATCC) UPS systems, which the ANSP states are at end of life. These UPS systems support the essential ATM systems for 90 minutes in the event of simultaneous mains and generator failures. The ANSP notes that a key benefit of this project is that mains failures will have no impact on ATC systems in Ballycasey and Dublin as the UPS systems will support all essential systems in the interim before the generators provide the power. Detailed cost build-ups have been provided to the NSA.

Urlanmore and Woodcock Hill Rx Site Generators – Proposed cost €300,000

14.92 The purpose of this project is to improve power supply resilience to IAA ANSP communication sites in Urlanmore and Woodcock Hill. It involves installing a generator to back up the VHF comms site in Woodcock Hill and provides for two new generators at Urlanmore HF Transmitter site, one to replace a 20-year-old existing generator and a second to provide back-up for NAC operations. Detailed cost calculation information is not available.

New Tower Parallel Runway Project (NTPR) – Proposed cost €49,856,000

14.93 The purpose of this project is to provide an air traffic service to the new north runway at Dublin airport, including a new control tower, ground infrastructure and ATM systems. The construction of this infrastructure, and of the new runway that necessitated its construction, are intended to provide the additional airfield capacity needed to meet projected future demand at Dublin Airport, and to alleviate the airfield congestion which was experienced during the latter part of RP2. This project is largely complete and is due to be capitalised in 2021.

14.94 The need for this project was triggered by the decision to construct a new parallel runway, the North Runway, at Dublin airport. We note that the IAA ANSP considered the option of a remote tower, and also sought expert advice in relation to the height and location of the tower, all of which material was provided to the NSA. Thus, the need for this project was clear and it is also clear that the IAA ANSP considered the options carefully.

14.95 Detailed, line-by-line construction and fit-out costs have been provided to the NSA. However, our calculations based on this material do not fully align with the IAA ANSP stated figure for the outturn costs (€43m vs €50m). We will investigate further before the final Performance Plan is developed and if necessary, seek further clarification from the IAA ANSP. As noted above, notwithstanding that this project is to be capitalised in 2021, as an outlier project which essentially complete we have included the full cost of €50m in our calculations, rather than applying the 20% reduction.

14.96 The IAA ANSP has proposed an asset life of 20 years for the core construction element of this project. For the same reasons outlined above in relation to the CEROC construction asset life, and as outlined in Section 6, we propose a 40-year asset life for this line item. We have also aligned the Navaids element of this project with the 12-

year asset life used for the Navaids replacement project discussed above. Other than that, the asset lives for other elements of this project are reasonable.

Project Summary table

14.97 Table A1 below provides an overview of all proposed IAA ANSP RP3 capital projects. Included in the table is the IAA ANSP's proposed cost for each project, their estimated asset life for each project, and the asset lives proposed by the NSA.

Table A1: Summary of New RP3 Projects

Project name	IAA ANSP cost proposal	IAA ANSP Asset Life	NSA asset life
Conditional Survey Works	€3,059,700	10 years	20 years
Security Upgrade Works	€1,364,000	10 years	10 years
National Security System Network	€1,937,500	10 years	10 years
Fire Suppression System	€697,500	10 years	15 years
Plant Upgrade Works*	€7,168,750	10 years	15 years
Cork ATC Building Extension	€2,325,000	25 years	25 years
Structural Upgrade Works	€2,092,500	25 years	20 years
Dublin ACC Building Works	€1,162,500	15 years	25 years
New Dublin Radar Building	€3,600,000	20 years	40 years
Energy Management Upgrade Works	€3,600,000	<10 years	15 years
Replacement of Building and Equipment Cooling System	€850,000	10-15 years	15 years
Temperature Checking Equipment	€220,000	<10 years	15 years
Climate Action Plan (Sustainability Management Plan)*	€5,000,000	10-20 years	20 years
Essential Building Upgrade Works at Mt. Gabriel	€775,000	15 years	15 years
2022-2024 ICT Infrastructure Life Cycle Management and Compliance	€3,330,000	3-5 years	3-5 years
Edison Core & Security	€1,020,000	8 years	8 years
IP Network Rollout	€1,020,000	8 years	8 years
Upgrades to Cable Ducting at Remote Sites	€500,000	8 years	20 years
ERIN TDM-IP Network Migration Project	€300,000	8 years	8 years
System Resilience NIS Compliance NIS Directive	€1,200,000	8 years	8 years
CYBERSECURITY NIS Directive	€750,000	8 years	8 years
Test Equipment for Navigational Aid Systems	€300,000	8 years	8 years
PABX Infrastructure Upgrade Ballycasey	€100,000	8 years	12 years
PABX Infrastructure Upgrade	€80,000	12 years	12 years
Airfield Cabling Replacement	€2,000,000	8 years	20 years
Integrated Met Server	€1,800,000	8 years	8 years
Radio Frequency Interference Hunting Upgrade	€100,000	8 years	8 years
Migration of FMTP from IPv4 to IPv6	€100,000	8 years	8 years
Upgrades & Contingency IAA NET	€200,000	8 years	8 years
VHF Replacement Programme	€1,800,000	8 years	8 years
Frequency Expansion Programme	€500,000	8 years	8 years
Tower Training Simulator	€1,000,000	8 years	8 years

IAA Smartmessenger (AFTN/AMHS) System Enhancements and ROFDS Contingency	€500,000	8 years	8 years
Emergency Air Situation Display System (EASDS) Replacement*	€6,500,000	8 years	8 years
New Voice Communications Switch	€4,500,000	8 years	8 years
Navaids Replacement Program*	€9,000,000	12 years	12 years
COOPANS Builds 3.6 to 3.8 Budget*	€8,000,000	8 years	8 years
COOPANS 2019 Roadmap Builds*	€8,000,000	8 years	8 years
Replacement of COOPANS Hardware	€3,000,000	8 years	8 years
ARTAS & SASS-C Upgrades	€500,000	8 years	8 years
ASMGCS Enhancements	€400,000	8 years	8 years
ATC Screen Replacement	€1,500,000	8 years	8 years
BMS Upgrade Dublin and Ballycasey ATCCs	€500,000	8 years	8 years
New En Route Contingency Centre at Ballygirreen*	€12,255,483	Building 20 years & ATM systems 8 years	Building 40 years & ATM systems 12 years
New Dublin Radar 2 Replacement*	€5,000,000	12 years	15 years
National Generator Replacements	€375,000	8 years	8 years
National Radar Upgrades	€4,000,000	12 years	12 years
PSR 2.6GHz Safeguarding	€920,000	8 years	8 years
Radar Site UPS Replacement	€525,000	8 years	8 years
Remote Power Management	€400,000	8 years	8 years
Shannon Tower Generator Replacement	€115,000	8 years	8 years
Terrestrial ADS-B	€500,000	8 years	8 years
Dublin and Ballycasey ATCC UPS Replacements	€270,000	8 years	8 years
Urlanmore and Woodcock Hill Rx Site Generators	€300,000	8 years	8 years
New Tower Parallel Runway Project (NTPR)*	€49,856,000	Tower building 20 years & the ILS & IRVR 8 years	Tower building 40 years & the ILS & IRVR 12 year.

Source: IAA ANSP, CAR. Note that these are project cost values, thus in some cases, not all of this expenditure will occur within RP3.

** Note: These projects are considered 'major investments' within the meaning of regulation 317/2019*