

The NATS logo is displayed in a white, italicized, sans-serif font in the top right corner. The background of the entire slide is a night-time photograph of a city skyline with numerous light trails from aircraft streaking across the dark sky.

NATS

NR23 business plan

7 February 2022



I am pleased to introduce our NR23 business plan for 2023-27, which includes the planning reappraisal following the impact of the Covid-19 pandemic. It was prepared and consulted on in record time during the second half of 2021, and I would like to thank our customers and the NATS team for meeting that challenge.

The UK aviation industry continues to face significant uncertainty which has hindered the scale and pace of sector recovery and our ability to plan for the future. When we started work on the plan, traffic volumes were still below 50% of 2019 levels. Now, as we submit our plan, traffic sits around 60%, and when it comes into effect in less than 12 months' time, traffic is forecast to have reached almost 90%. More importantly, forecasts suggest traffic volumes will exceed all previous records during the plan period with additional growth beyond that. However, every forecast for the past 20 months has proved wrong, and it is clear that the pandemic is not yet over, as demonstrated by the recent emergence of the Omicron variant which has further dampened recovery.

The industry has never faced such a prolonged period of volatility, and we have never had to offer a business plan covering such a broad range of possible scenarios and outcomes. Nor have we presented a plan in a time of such financial distress for the industry.

Our cash receipts during 2020 and 2021 were down by 60% and in some months we received no cash at all. To survive, we took extraordinary measures to reduce expenditure and refinance the business and we have retained many of the efficiencies we implemented during this period. We have also offered to defer some £180m of cost recovery into future price control periods, to support our customers' recovery.

To maintain our services at the right quality, our business must also remain financeable. Our plan delivers a balance between these challenges. We have maintained flexibility and capability to ensure we can provide good service quality across a range of traffic levels in NR23, so that we are not a brake on recovery.

Our plan is highly integrated, as required for critical national infrastructure, with target outcomes dependent on inputs across many areas. Alongside good service quality, it increases resilience and enables us to progress our technology and airspace transformation programmes at broadly similar overall costs to 2019.

It also reflects an intense period of consultation with airline customers, including their feedback on ten options worth £430m in NR23, as well as input from airports and, for the first time, the travelling public. This has been extremely helpful in fine-tuning our plan for the period ahead.

Inevitably, at times the feedback we've received has reflected diverging priorities between different customers, and with passengers. We have listened carefully, responded to requests for change and taken direction on the options we presented. We have published a number of appendices alongside this plan, containing extensive additional data and other information to support the plan we are putting forward.

Clearly, in such uncertain times, we will need to monitor carefully the pace of traffic recovery over coming months and the balance of resources and service targets while the CAA conducts its review. We look forward to engaging on the CAA's proposals in the coming months.

A handwritten signature in dark ink, appearing to read 'Martin Rolfe'. The signature is stylized and fluid.

Martin Rolfe, CEO

Contents

NERL's NR23 Business Plan (this document)

Chapter 1	Summary	4
	<i>A summary of our plan, including impact of Covid-19</i>	
Chapter 2	Customer and passenger priorities	7
	<i>Our understanding of customer feedback on our emerging plan and passenger priorities</i>	
Chapter 3	Traffic outlook	12
	<i>The range of forecasts for flights and service units, and how this impacts our plan</i>	
Chapter 4	Performance outcomes and metrics	17
	<i>Projected performance for safety, capacity, and environment</i>	
Chapter 5	Service delivery	22
	<i>Operational resourcing, technical systems, and our approach to integrating new airspace users</i>	
Chapter 6	Capital investment	27
	<i>Overview including strategy, deliverables, and options</i>	
Chapter 7	Determined costs and prices	33
	<i>Overview of cost base, including regulatory building blocks, underlying unit costs and prices.</i>	
Chapter 8	Oceanic plan	46
	<i>Oceanic traffic forecast, service performance, capital investment and charges</i>	
Chapter 9	Regulatory mechanisms and prices	52
	<i>Uncertainty mechanisms, incentives, and other regulatory mechanisms</i>	

Appendices to NERL's NR23 Business Plan

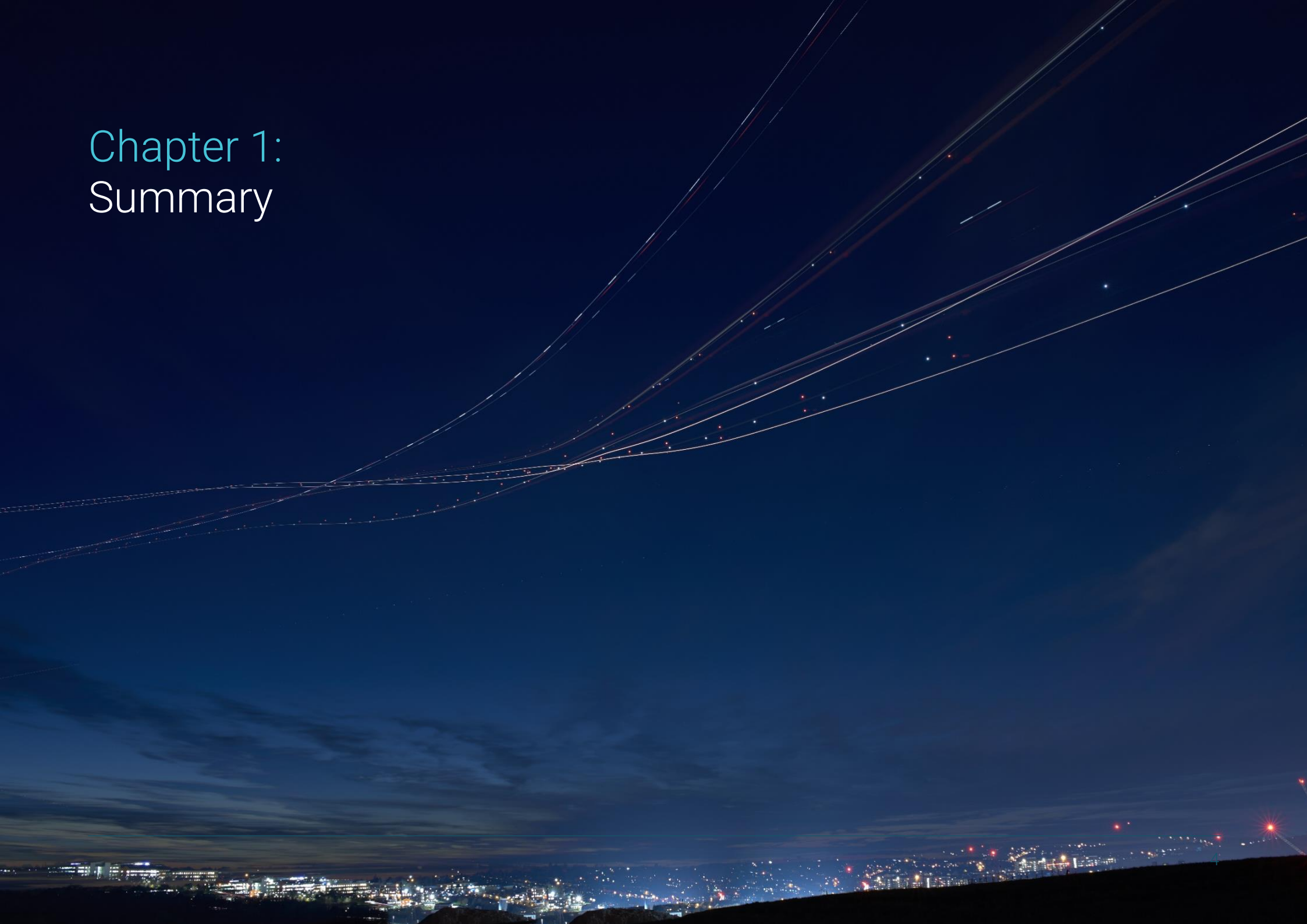
Appendix A	CAA guidance on NERL's NR23 business plan
Appendix B	Customer and passenger consultation
Appendix C	Traffic forecast
Appendix D	Safety
Appendix E	Capacity
Appendix F	Environment
Appendix G	Operational resourcing
Appendix H	Capital investment
Appendix I	Determined costs, DUCs and prices
Appendix J	Operating costs
Appendix K	Cash pensions
Appendix L	Single till income
Appendix M	Cost of capital
Appendix N	Financeability
Appendix O	Benchmarking
Appendix P	Regulatory model and mechanisms
Appendix Q	Scenarios

Supporting material

Customer consultation co-chairs' report ([link](#))
Passenger research report ([link](#))
Cost of capital study ([link](#))
Wages benchmarking study ([link](#))

Commercially sensitive information has been redacted throughout this NR23 business plan document, the appendices and supporting material.

Chapter 1: Summary



Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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Summary

Our business plan for NR23 focuses on the core capability we need to deliver safe, efficient, predictable and reliable services. It also addresses the considerable uncertainty and wide range of scenarios that we face over the period. It has been shaped by our engagement with our airline customers and by our understanding of their needs and those of their passengers. Our plan will deliver:

- › **A safe air traffic system** under a range of foreseeable recovery scenarios
- › **Efficient service levels** underpinned by operational and technical resilience
- › **Cost effective prices** to support industry recovery, including deferring recovery of 2020-22 revenue shortfalls and profiling prices
- › **Capacity increases** to support 2027 traffic levels up to 15% higher (high case) than 2019, which themselves were the highest ever
- › **Enhanced environmental and fuel benefits**, consistent with our obligation to achieve net zero emissions, and increased societal expectations on aviation
- › **Appropriate financial resilience** against a slower recovery or future traffic/economic shocks, essential for maintaining critical national infrastructure

To achieve the above, our plan requires the resources to:

- › Develop and train the next generation of air traffic controllers to mitigate expected retirements, safely meet projected demand and provide further operational resilience

- › Progress our technology transformation programme, started in RP2, while sustaining our legacy technical equipment
- › Advance airspace modernisation to improve environmental performance and accommodate future traffic growth
- › Invest in solutions targeting net zero carbon emissions by 2035

Our plan is provided at an underlying en route unit cost of around £52 (2020 prices), or £2-£3 per passenger per flight, around 2% higher than the actual 2019 unit cost driven by lower traffic at the start of NR23.

The NR23 outcomes are summarised in the table below.

Area	Metric	Target
Traffic	UK flights (base case)	2.4m to 2.6m pa (-6% to +2% vs 2019)
	Chargeable service units (base case)	11.6m to 12.7m pa (-7% to +2% vs 2019)
Safety	Range of European and UK based metrics	Maintaining or improving safety performance vs 2019
Service quality	C1: all causes delay	14.7 – 15.3 seconds per flight
	C2: NERL related delay	10.2 – 10.8 seconds per flight
	C3: weighted score	20 – 22 seconds per flight
	C4: variability of daily average delays	1800 score
	Technical resilience	Compliance with Licence Condition 2
Environment	3Di flight efficiency	27.6 – 28.0 pa score
	Contribution to net zero	On target for 4.4pp reduction by 2035
Investment	Total NR23 capital investment	£574m (2020 CPI prices)
Financials	Total operating costs	£433m pa average (1% lower vs 2019)
	Total determined costs	£670m pa average (1% higher vs 2019)
	Underlying en route DUC	£52 pa average (2% higher vs 2019)

NR23 plan outcomes

Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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The impact of Covid-19 and our response

The most severe crisis in commercial aviation history reduced traffic levels to just 10% of the previous year in April 2020, causing serious liquidity challenges across the industry including for NERL. Despite this, we kept UK airspace open and safe throughout the pandemic ensuring cargo, emergency services and military flights could continue alongside the minimal levels of commercial aviation.

Underlying cash receipts fell by almost £300m (57%) in 2020 compared to the RP3 plan. Further cash shortfalls of almost £700m are expected while traffic is below the settlement forecast across 2021 and 2022 (70% and 32% reductions in 2021 and 2022).

In response, we reduced cash outgoings in RP3 by over £500m (2020 prices) vs the plan, as shown below. Many of these savings are temporary in nature, but we also made changes to our underlying ongoing cost base by implementing a voluntary redundancy programme reducing non-operational headcount by around 350 employees. Critically, we retained the skills essential to support recovery.

Action (£m, 2020 prices)	2020	2021	2022	Total
Freeze recruitment	£15m	£23m	£19m	£57m
Release contractors	£13m	-	-	£13m
Reduce discretionary spend	£34m	£43m	£25m	£101m
Reverse pay award, voluntary pay cuts, unpaid leave and suspend bonuses	£9m	£20m	£8m	£38m
Furlough scheme	£26m	£9m	-	£34m
Voluntary redundancy programme		£34m	£34m	£68m
Scale back capex programme	£113m	£76m	£4m	£193m
Total	£210m	£205m	£90m	£505m

Summary of NERL's management actions and support to preserve cash vs pre pandemic plan

(not including costs of VR programme and impact of non-cash items)

While we made use of generic UK-wide Government support schemes, such as business rate reductions, there was no dedicated state funding for NERL, as was available for ANSPs in other countries. We made careful use of the flexible furlough scheme to maximise the support available to protect jobs and to mitigate the impact of the pandemic on airline prices.

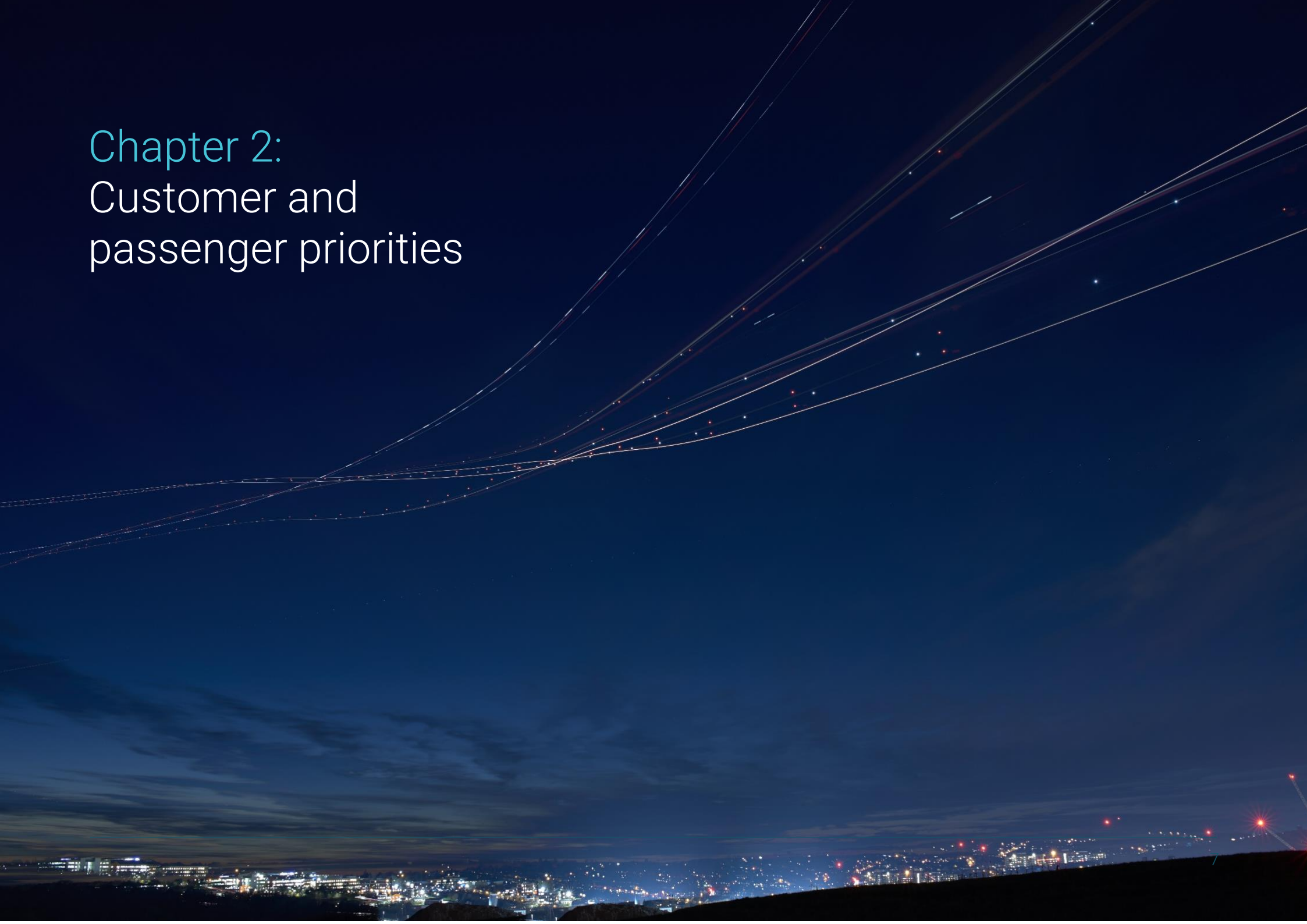
We supported the CAA's policy decision to defer the price control reset to 2023 to support industry recovery, in contrast to the approach taken in Europe which reset prices in January 2022 leading to average 14% year on year increases for EU (SES) countries. The UK approach provides lower charges than would otherwise be the case, while increasing the pressure on our finances to bridge the funding gap for longer than other ANSPs had to.

To secure ongoing viability, we refinanced the business. This totalled £1.6bn, injecting around £0.9bn of additional funding and liquidity support into the aviation sector by enabling us to defer collection of the 2020-22 revenue shortfalls (the TRS debtor) into NR23 and NR28. It ensures we are well placed to support aviation recovery.

Our net debt increased significantly as a result, and further increases are expected before NR23. Our gearing [~~3x~~ redacted] as a consequence (projected to be [~~3x~~ redacted] by September 2022 under our base case assumptions, up from around 29% prior to the pandemic). This limits our ability to mitigate the impact of further shocks to the sector.

We therefore need to take steps in NR23 to restore the financial resilience of the company, ensuring a sustainable, reliable service for the future. This includes recovering the TRS debtor through temporary uplifts to prices, as outlined in [Chapter 7](#).

Chapter 2: Customer and passenger priorities



Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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Overview

We have ensured that our plan is customer and consumer focused, in line with CAA guidance, by integrating our engagement and research with the development of our plan. Working to a compressed timetable, we have presented customers with the outline content of the plan and sought feedback on this and a range of options. In parallel, we have refreshed our understanding of passengers' priorities as they consider air travel again after the pandemic.

Our NR23 customer consultation comprised 11 meetings with airline customers and two separate sessions for airports, covering the emerging plan in full. These meetings were attended by 26 organisations with observers from the CAA and NATS' Trade Unions.

The process helped to validate the overall shape and content of this plan, as well as providing direct actionable feedback on the options we put forward. For some issues consensus did not emerge; in these instances, we have put forward a proposal which we believe balances the interests of the various stakeholders. The consultation also recognised the need to revisit some topics, notably traffic forecasts and financial market developments for further updates in 2022.

The Customer Consultation Working Group co-chairs provided an interim progress report, published at the end of October, and a final report which consolidated feedback from the whole consultation, in mid-December 2021. The final report noted how the process enabled collaborative engagement between stakeholders, and that information and materials had been provided in good time throughout the process.

It detailed areas of broad agreement, areas where there was a lack of support from customers and areas of qualified support. Recognising the compressed timescales for business planning compared to previous regulatory periods, the co-chairs highlighted that airlines felt they had to reserve their positions on many aspects of the plan pending further

information. This plan document, together with the appendices, provides that further detail as far as possible.

For airline customers and the CAA, a complete record of the consultation materials and minutes are available on the [NERL NR23 website](#). Further details on the process are provided in [Appendix B](#).

We welcome the CAA's proposal to invite further feedback from airlines and other stakeholders on our NR23 plan, following its publication, to help inform the CAA's initial proposals for NR23 in summer 2022.

Summary of consultation feedback

The main themes of feedback from the customer consultation are summarised below, together with an explanation of how NERL has responded to these in the final plan. This linkage between engagement and plan aligns with CAA business plan guidance. Full details of the outcomes from customer consultation are provided in [Appendix B](#).

- › **Traffic forecast:** Customers supported the use of Eurocontrol's STATFOR forecast due to its independence. We have therefore based the NR23 plan on the STATFOR October 2021 base case, although it will be important to reassess the plan, in particular service performance and prices, as updated forecasts become available. Further detail available in [Chapter 3](#) and [Appendix C](#).
- › **Service performance outcomes:** There was broad support for the continuation of proposed safety, capacity and environment metrics and targets, however airlines requested further evidence that the targets are appropriately calibrated and sufficiently stretching. We have revised the targets to reflect the latest traffic forecast. Projected outcomes are better than historic performance, even in light of the impact of growing traffic and implementing our technology change programme. Further detail on the targets and calibration is in [Chapter 4](#) and [Appendix E](#) and [Appendix F](#).

Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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- › **Operational resourcing:** Customers supported our approach to plan for a margin of resilience in operational resourcing in order to accommodate the potential for traffic to exceed base case projections, and asked how we would manage the apparent shortfall against predicted high case demand. We continue to refine and prioritise our operational resourcing plans, and will take every measure to ensure we continue to provide an efficient service to all flights under foreseeable traffic scenarios. However, the implications of actions taken in response to Covid-19 will create challenges to meet STATFOR October 21 high case demand in all years of NR23. Further detail is provided in [Chapter 5](#) and [Appendix G](#). There was broad support for our proposal to improve training capability, albeit a request for clarity on the benefits – we have included this in our plan, with further detail in [Appendix G](#).
- › **Capital expenditure:** Following discussion through the Service and Investment Plan (SIP) process, there was no material feedback on the scope, milestones and costs of our capital investment portfolio. Discussion at the consultation focused on RP2 cost overruns, 'legacy escape' (the point at which we decommission our existing systems), sustainment, the implications of the investment on operating costs, and how the enabled benefits will contribute to plan outcomes.

There was broad support for NERL's proposal to build on existing customer engagement by planning two years in detail on a rolling basis, with a strategic look ahead for the following five years ('2+5'). Airlines asked how this would dovetail with the NR23 regulatory period. Further detail is available in [Chapter 6](#) and [Appendix H](#).

- › **Determined costs:** The efficiencies made in response to Covid-19 were positively received through the consultation, albeit airlines requested further detail on the evolution of each of the building blocks; this is available in [Chapter 7](#) and [Appendix I](#).
- › **Price profiling:** Airlines did not support the recovery of 2020-22 revenue shortfalls (the TRS debtor) via the unit rate preferring the UK Government to bear this cost. We offered a number of options for the TRS debtor recovery profile at the consultation, but there was no clear consensus on the period over which to recover the costs, and there was a lack of consensus on a preferred price profiling option. We have therefore sought to take the middle ground in our plan, and our prices are presented in [Chapter 7](#) and [Appendix I](#).
- › **Regulatory mechanisms:** Customers sought further detail on our proposal to increase the range of the traffic risk share (TRS) mechanism for the en route business and provided neither support nor substantive objection for our proposal to introduce traffic risk sharing for the oceanic business. We have incorporated both proposals into our plan and have provided further details in [Chapter 9](#) and [Appendix P](#). Customers supported the current balance of service performance incentives, and we have therefore not made any change in our plan.

As described above, we sought specific feedback from customers on a number of options presented in our plan. Our understanding of customer feedback for each option is summarised in the table below, together with an explanation of how we have taken this into account.

Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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Option	Description	NERL understanding of customer feedback	Status in NR23 plan
Increase focus on providing efficient routes	Increased financial incentive against 3Di performance, with rebalanced incentives across other metrics	No support – airlines' priority is equally capacity (therefore limited appetite for increasing incentive on 3Di)	Removed following feedback: Not included in our plan
Improve operational training capability	Around £15m investment to reduce training lead times and improve agility in resource planning	Broad support for the concept, but clarity on business case/benefits required	Added following feedback: included in our plan, further details in Appendix G
Integration of new airspace users	Around £35m investment to support the safe integration of new airspace users such as drones and space flights	No support, on grounds that "user pays" principle should apply, CAA and industry must try their best to create charging regime for NERL new user activity by NR23	Removed following feedback: not included in our plan, further details in Chapter 9 and Appendix P
Enhancements to the capital investment portfolio	Changes to the mix and scope of NR23 capital investment portfolio	Support, subject to further consultation on costs, benefits at SIP	Removed following feedback: not included in our plan, to be implemented via the SIP
Smaller capital investment portfolio	Reduce investment in technology transformation and airspace modernisation by £50m	No support, contrary to strategic goals for airspace and technology	Removed following feedback: not included in our plan
2+5 approach to planning	Build on extent of customer engagement by planning 2 years in detail with a joint strategic lookahead	Support, subject to further definition of process including Licence interaction	Added following feedback: included in our plan, mechanism and governance to be developed via SIP forums, feeding into and/or drawing from CAA guidance. Further details in Appendix H .
Adjusted traffic risk sharing mechanism	Modified mechanism to spread the financial impact for customers of charge increases arising from any future major traffic downturns	En route TRS spreading support (even though continued objection to concept overall); Oceanic new TRS: further information sought by airlines	Added following feedback: included in our plan, further details in Chapter 9 and Appendix P .
Cost / price profiling between NR23 and NR28	Reduced prices in NR23 to support customer recovery	Support for deferring TRS debtor recovery into NR28, but less so for depreciation deferral	Changed following feedback: plan defers 25% TRS recovery to NR28, depreciation deferral not included in plan, further details in Chapter 7 and Appendix I .
Price profiling within NR23	Reduced prices at the start of NR23 to support customer recovery	Mixed feedback: some prefer to avoid rising price at end of NR23, others want low start price for 'affordability'	Changed following feedback: plan offers flat real prices in NR23, further details in Chapter 7 and Appendix I .
Changing the charging basis	Proposal work together in NR23 on charges based on aircraft emissions to increase focus on environmental performance	Support further work to explore practicable options, subject to concerns about impact on emissions vs effort and managing unintended consequences	Added following feedback: included in plan, working group with airlines and CAA to be established

Summary of customer feedback on options

Insight from passenger research

Alongside consultation with airlines and airports, we used passenger research to inform our NR23 business plan. The structure of the research was developed following consultation with customers, the CAA and the CAA consumer panel. In line with CAA business plan guidance and with earlier advice from the CAA consumer panel, we took account of the views of passengers as consumers on a range of questions related to the developing business plan. A summary of the main insights is provided below, and further detail is available in [Appendix B](#) and the [passenger research report](#).

Safety was the number one priority for passengers, matching our primary objective to provide a safe service in NR23. Their next highest-ranking priorities were:

- › working to minimise the impact of aviation on the environment by delivering efficient flight paths to reduce CO₂ emissions
- › providing operational and technical resilience to reduce the chances of events causing cancellations and major disruption
- › a punctual service

Keeping costs low was the lowest priority for the majority of passengers by some margin, suggesting that where small incremental ticket price increases are required to deliver a safe, resilient and efficient service, this is acceptable to consumers.

The survey also indicated clear passenger preference for satellite ADS-B¹ across the oceanic service to provide enhanced safety benefits, rather than to save the costs of the associated data charges.

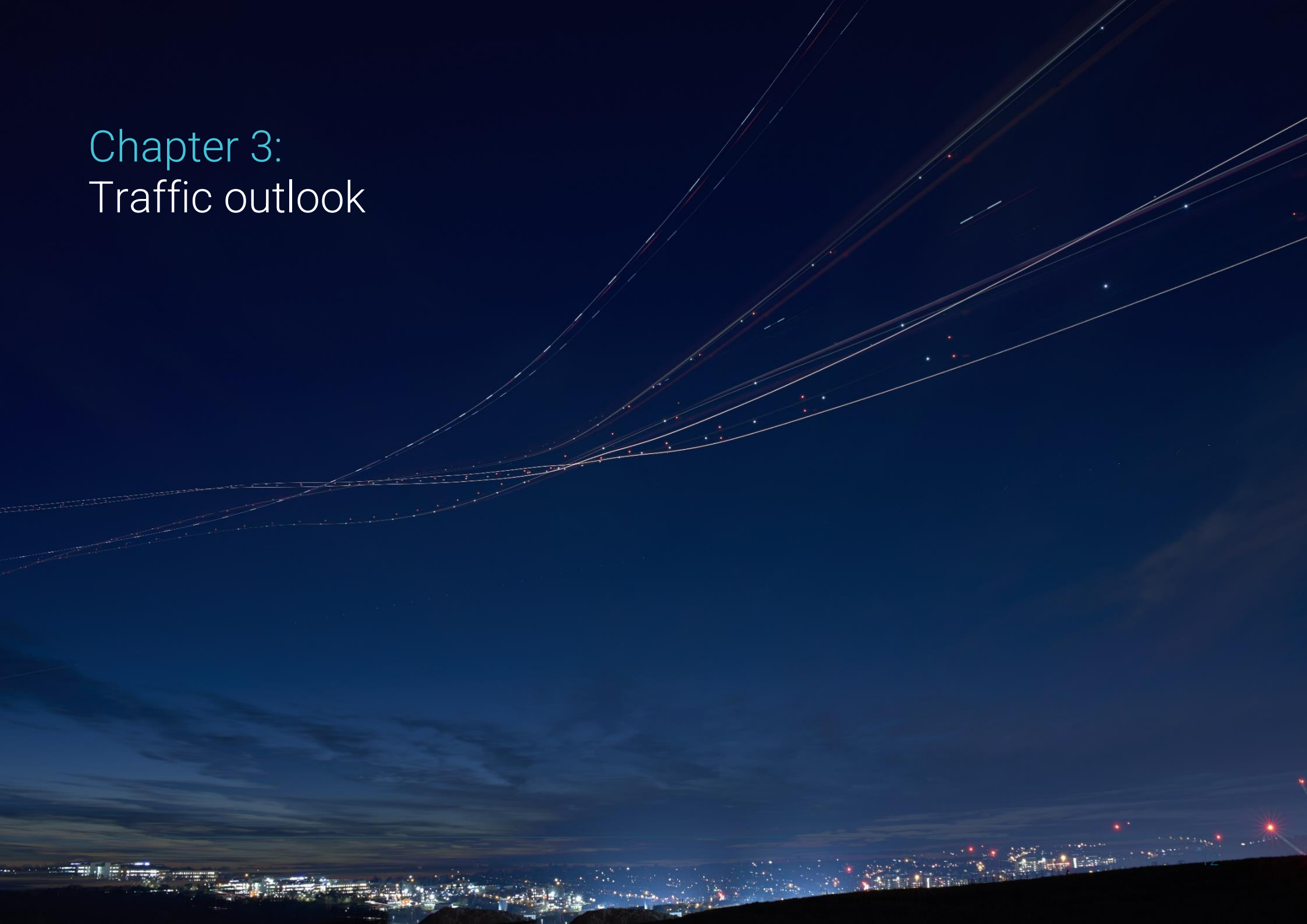
Passengers strongly supported the service we currently provide and demonstrated a high degree of trust in NERL to deliver a safe, reliable operation. This endorses the approach taken in our business plan, continuing to deliver better outcomes for airlines and passengers through operational resourcing scaled to meet the recovery in demand, modernising airspace to reduce CO₂ emissions and continuing investment in the new generation of ATC technology platforms.

However, passenger feedback is at odds with airline feedback on elements of our plan; passengers placed greater priority than airlines on taking actions to reduce the environmental impact of flights, and to invest in new and refreshed technology to maintain and develop the service. Passengers placed less emphasis on reducing relatively short delays due to air traffic control, and on the incremental impact of cost increases on ticket prices. Recognising that the overall ethos of the plan is broadly in line with passenger priorities, we have tried to follow airline feedback on specific options within these areas.

In line with CAA guidance, we explore in [Appendix B](#) how we resolve the differing priorities of consumers and customers.

¹ Automatic Dependent Surveillance - Broadcast (ADS-B) is a surveillance technology in which an aircraft determines its position via satellite navigation or other sensors and periodically broadcasts it, enabling it to be tracked

Chapter 3: Traffic outlook



Planning assumption

The number of flights and service unit forecasts are fundamental assumptions, underpinning our operational resourcing requirements, service performance outcomes and charges in our plan.

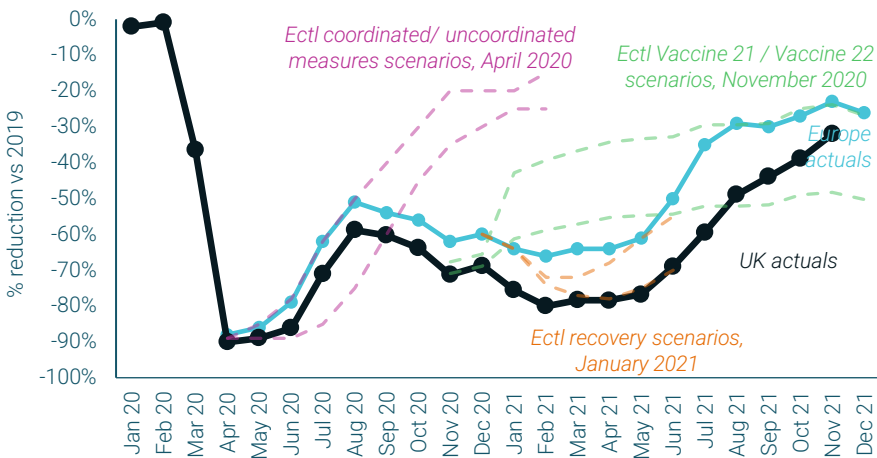
We have used the STATFOR² October 2021 base case as the basis for our NR23 plan. As STATFOR does not produce an oceanic forecast, we have derived a forecast from the appropriate STATFOR data set. The forecast is summarised below, and the full set of forecasts is provided in [Appendix C](#).

Forecast uncertainty

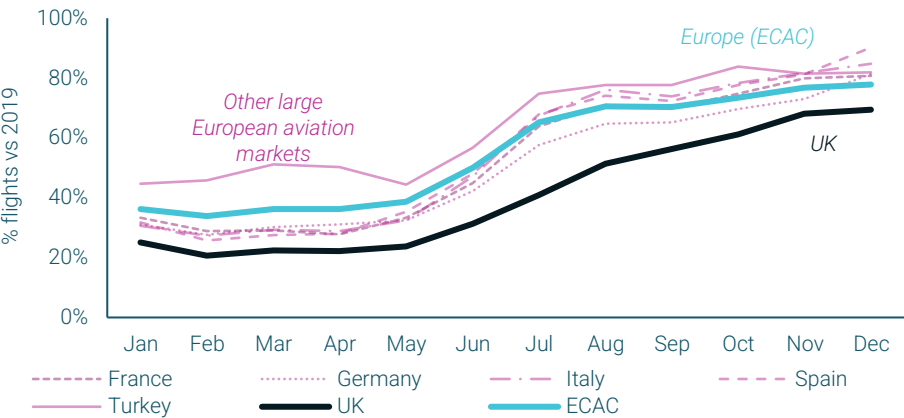
Since March 2020, it has proved extremely difficult to forecast the recovery of air traffic from the pandemic. Multiple forecasts have been issued by different organisations only to require rapid revision.

In particular, successive STATFOR short-term outlooks proved to be overly optimistic for the UK and the recovery here consistently lagged Europe’s throughout the pandemic, as shown in the following charts.

In 2021, the UK was among the most severely affected countries in Europe, with only Finland and Ireland faring worse; arrivals and departures were down by 62% vs 2019 levels and overall traffic was 59% lower than in 2019 (vs 44% for Europe as a whole)³.



Comparison of UK recovery vs. STATFOR forecasts to December 2021



Comparison of UK recovery vs. other large European aviation markets (source: STATFOR)

Uncertainty continues to dominate at the time of writing. The Omicron variant was only designated in late November, after STATFOR issued its

² STATFOR is the traffic monitoring and forecasting arm of Eurocontrol

³ Eurocontrol analysis

Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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latest forecast and our customer consultation had concluded. Its rapid spread generated new travel restrictions and many flight cancellations over the important winter holidays. It is reasonable to assume it has dampened the recovery once again and the next forecast, due in May 2022, will include significant changes for 2022 at least.

It remains to be seen whether the pandemic, and society's response to it, will have a lasting impact on demand for flying. For example, the wide adoption of remote working and video conferencing could cause the business travel sector to shrink permanently.

There was strong evidence of pent-up demand at the start of summer 2021⁴, particularly for leisure travel, suggesting the potential for a strong recovery. However, this did not materialise due to the staggered cycles of the Delta and Omicron variants in various parts of the world.

Ultimately, passenger confidence and future demand will be driven by the unfolding profile of the pandemic over time and different governments' responses to further waves.

In addition, renewed focus across society over recent years about the environmental impact of aviation has raised some questions about future demand and the desirability of flying.

As a result, there is a possible scenario in which traffic volumes never return to 2019 levels. It will take some time, beyond the start of NR23, to see whether this materialises.

STATFOR will issue two more forecast updates in May 2022 and October 2022. They are already indicating that traffic is now likely to trend towards their pessimistic scenario in the short term⁵.

Given this uncertainty, it will be critical for NERL to have the opportunity to reassess its plan in light of these new forecasts to ensure prices and

service performance outcomes are appropriately calibrated to the projected traffic levels.

Sensitivities

The CAA has provided guidance that we should plan for a plausible range of traffic scenarios. This includes indicating the trades-offs to be made under each with the likely implications for operating costs, capital expenditure and service quality. Airline customers also sought to understand the levers that could be used to respond to different traffic volumes.

While retaining the essential focus and coherence of a single business plan based on a central traffic forecast, we have explained and quantified the likely impacts of traffic diverging away from forecast during the NR23 period, and described the levers available to us. We shared this analysis as part of the customer consultation process; as we received no feedback from either customers or the CAA, we believe we have met the CAA's business plan guidance in this area. Further detail of our analysis is provided in [Appendix Q](#).

UK flights forecast

STATFOR released three forecast scenarios in October 2021, covering the period to 2024. In the forecast, STATFOR adopted more pessimistic assumptions for UK traffic recovery than for the rest of Europe, reflecting the slower recovery experienced in the UK to date:

- › High case: recovery to 2019 levels by end of 2023 (Europe: mid 2023), based on a widely available and effective vaccine worldwide, good levels of passenger confidence and supported by a 'consumer boom' fuelled by pent up demand and savings accumulated over the pandemic.

⁴ Covid-19: An almost full recovery of air travel in prospect, IATA, , May 2021 ([PowerPoint Presentation \(iata.org\)](#), accessed September 2021)

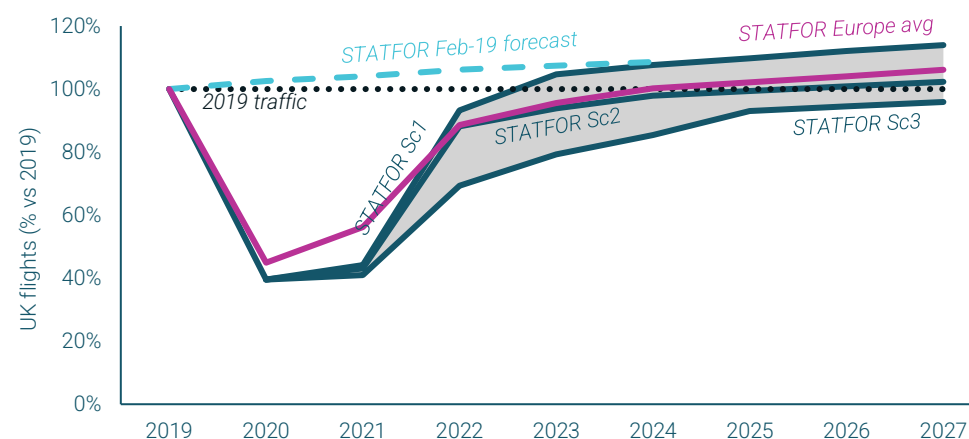
⁵ https://www.linkedin.com/posts/eurocontrol_covid-activity-6873348507223252992-p6nE

Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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- › Base case: recovery to 2019 levels by end of 2025 (Europe: end of 2023), based on an effective international vaccine roll-out, easing of travel constraints boosting passenger confidence.
- › Low case: recovery to 2019 levels after 2027, based on continued levels of Covid-19 infection, frequent reintroduction of lockdowns, an ineffective vaccine programme, and low passenger confidence.

Once traffic has returned to 2019 levels, future growth is projected to be tied to underlying economic performance, constrained by airport capacity which is likely to return as an issue during NR23. By 2027, flights are projected to be 2% higher than 2019 levels in the base case. This is significantly lower than pre-pandemic forecasts that traffic levels would grow by 10% by 2024 – midway through the NR23 period.

The high case returns to pre-pandemic forecasts by 2023, underlining the uncertainty that exists during the development of the plan.

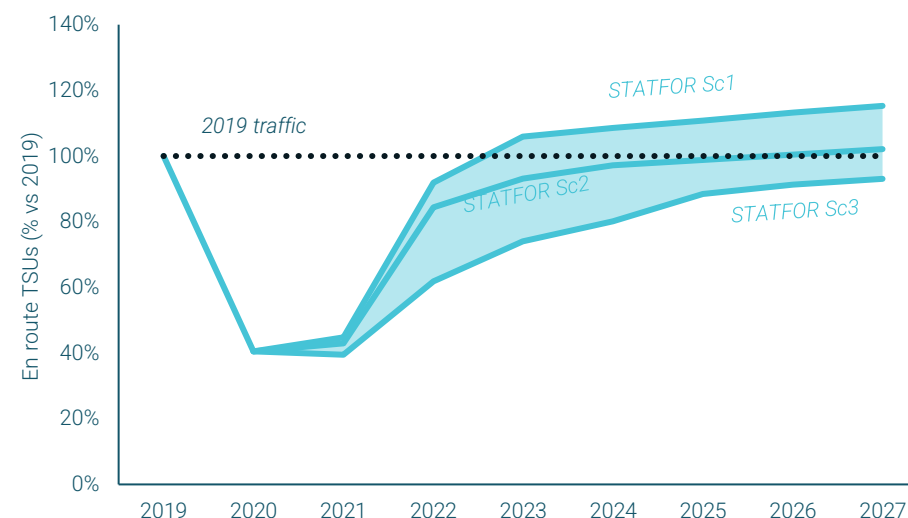


UK flights forecast to 2027 (STATFOR October 2021)

Service units forecast

Service units are used as the charging basis for flights⁶. They are calculated from the distance flown and the maximum take-off weight for an aircraft.

STATFOR's service unit forecast assumes that the number of service units per flight in NR23 is broadly unchanged from pre-pandemic levels. It is therefore aligned to the trends in the flight forecast; the base case shows a recovery to 2019 levels by the end of 2025.



UK service units forecast to 2027 (STATFOR October 2021)

⁶ A service unit is defined as the product of (distance flown, in km/100) and the square root of (MTOW, in tonnes/50). For example, a flight from London to Rome in an A320 with MTOW of 83 tonnes would incur 18.6 service units.

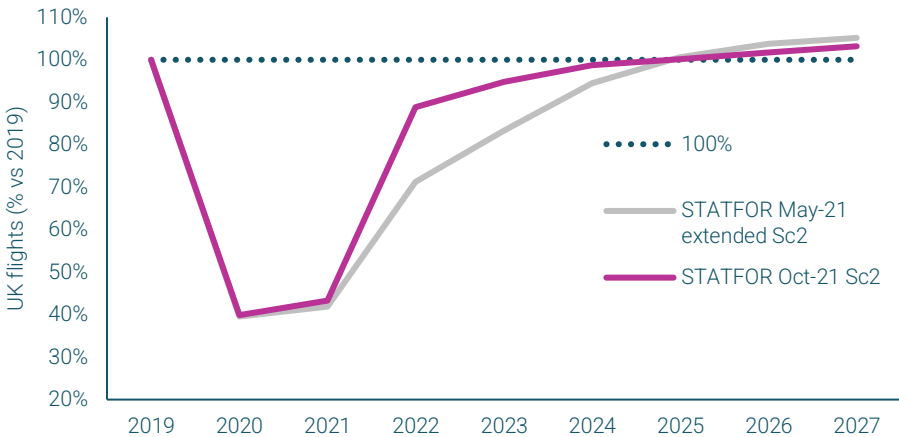
Comparison to May 2021 forecast

Our emerging plan for customer consultation was based on the May 2021 STATFOR base case. STATFOR’s October 2021 base case projects higher traffic levels in the early part of our plan (2022-23), and broadly similar traffic levels in the later years.

In updating for the October 2021 STATFOR traffic forecast, we have considered the impact on operational resourcing and service performance outcomes:

- › **Operational resourcing:** Our emerging plan already contained provisions for running controller training at maximum capacity throughout NR23. Therefore, there are no credible actions that could be taken to increase resourcing in the early part of NR23, despite the traffic outlook being higher in the STATFOR October 2021 forecast. We will continue to train at full capacity throughout NR23 given the significant uncertainty that exists, in order to provide operational resilience and flexibility to respond to changing traffic levels, as well as to mitigate the impact of anticipated retirements in NR23 and NR28. Further detail is in [Chapter 5](#) and in [Appendix G](#).
- › **Service performance:** We have reassessed our service performance outcomes relative to our emerging plan, to take account of the

updated traffic forecast. In particular, we have revised the capacity and environment performance targets for 2023 and 2024 upwards (lower performance levels) in recognition of the higher traffic forecast in this part of NR23. Further detail is in [Chapter 4](#).



STATFOR October 2021 forecast vs STATFOR May 2021 forecast

Chapter 4: Performance outcomes and metrics



Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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Safety

Safety is at the heart of what we do and will continue to be our priority. Passengers and customers identified it as the primary focus for NERL. In particular, airline feedback centred around the need to:

- › ensure safety levels are maintained against the background of rising traffic, including the safety implications of new airspace users
- › articulate the safety benefits from planned investments and the real-world practical safety improvements that ADS-B has enabled.

We will continue to measure safety against a range of metrics to ensure we maintain or improve performance. The metrics will assess:

- › Rate or number of serious incidents (including airprox and RAT events)
- › Rate of runway incursions and losses of separation
- › Effectiveness of safety management.

Alongside the usual safety challenges that we will continue to manage and mitigate, our plan takes account of the evolving operational environment. It contains the resources required to manage safety risks appropriately. The specific additional safety priorities for NR23 include:

- › **Supporting traffic recovery:** As controllers have not provided a service in a high traffic environment since early 2020, they will all complete a series of refresher training courses, including in the early parts of NR23 when traffic is still expected to be below 2019 levels.
- › **Technology transition and airspace modernisation:** Investment in technology enhancements to electronic flight strips to improve the link between en route and approach operations, and airspace modernisation, will improve safety and help mitigate the effect of increasing traffic.

- › **New airspace users:** The expected increase in 'beyond visual line-of-sight' drones and the emergence of other new airspace users, such as commercial space launches and vertical take-off vehicles, during NR23 will provide new challenges to UK airspace and our operation. There are many uncertainties about how this new market will evolve, but it has the potential to compound current risks, such as infringements to controlled airspace, and to introduce new ones. However, following customer feedback, our plan only contains the funding required to ensure the continued safety of commercial aviation. We did consider a level of further investment to enable the safe integration of new classes of airspace users, but have not included this in our plan following strong airline support for the 'user pays' principle. We continue to believe it essential that a suitable source of funding is established to mitigate the new risks created by additional airspace users and require support from the CAA on this. Further information is provided in [Chapter 9](#).
- › **Oceanic surveillance:** Our plan assumes the continued use of ADS-B in our oceanic operation. Since its introduction, ADS-B has improved safety; ICAO reported that more frequent surveillance had led to a 33% reduction in vertical collision risk across the North Atlantic between 2018 and 2019. The safety benefit of ADS-B in 2020 cannot be isolated from the impact of lower traffic, although we anticipate further demonstrable safety improvement as volumes increase. Further detail is provided in [Chapter 8](#).

Further information on our safety metrics and targets is provided in [Appendix D](#).

Capacity

Airline customers were clear that it is critical that NERL can meet capacity demands as the industry recovers from the pandemic, and punctuality featured as a priority area for passengers. Passengers also highlighted that the focus for NERL should be reducing the chances of events causing cancellation and major disruption, which aligns with customer feedback.

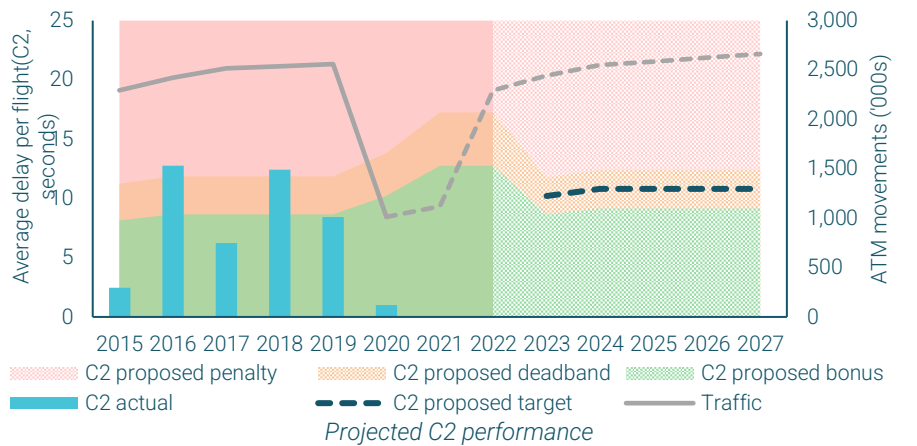
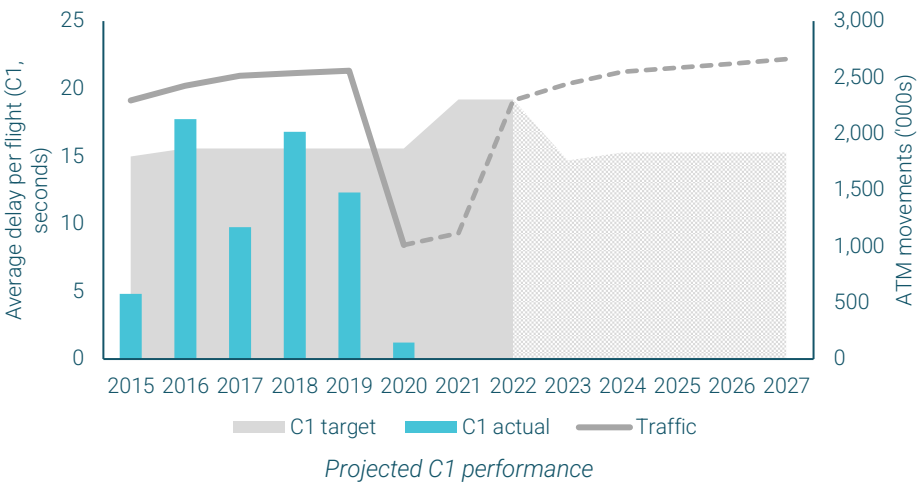
Our planned service performance outcomes are based on the same metrics and coding structure as our RP3 plan (C1, C2, C3 and C4). We also retain the concept of ‘exemption days’ which is used to exclude the impact of planned airspace and technical transitions on pre-nominated days.

Starting from very low levels in 2020 and 2021, underlying delay (excluding delay from planned airspace and technical transitions) will increase as traffic returns. We expect, though, improved service performance compared to historic levels up to 2023, when traffic returns to 2019 levels.

C1 performance is dependent on the planned implementation of capital investment programme milestones. As this measure includes transition delay, it will be adjusted in line with the programme, as required. Current planning assumptions mean that DP En Route implementation (see [Chapter 6](#)) will impact the overall level of service during 2023 and 2024, though underlying delay is lower at this time due to reduced traffic.

C2 projected performance follows a similar trend to C1. Our proposed target is 10.2 seconds per flight for 2023 and rises to 10.8 seconds from 2024. This is also dependent upon the planning assumptions for DP En Route implementation. Our proposed target is similar to the RP2 target (10.8 seconds) despite the higher average traffic forecasts than in RP2, but is lower than the RP3 plan (15 seconds).

C3 projected performance is based on doubling the C2 targets (as was the case for RP3). The RP3 C4 target is retained without change.



Metric	C1	C2	C3	C4
2023	14.7	10.2	20	1800
2024	15.3	10.8	22	1800
2025	15.3	10.8	22	1800
2026	15.3	10.8	22	1800
2027	15.3	10.8	22	1800

Summary of capacity targets

Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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These metrics and targets will need to be revisited for emerging external developments, in particular the impact of space launches which are likely to have a serious adverse impact on service quality. We therefore propose that a reopener mechanism is agreed ahead of the NR23 period to manage this and the implications for the service incentives.

We propose a new modulation mechanism to respond to uncertain traffic volumes. This would adjust the C2 and C3 incentive thresholds if actual traffic deviates by more than 4% from the forecast. This will ensure that we are appropriately incentivised to deliver capacity requirements at the prevailing traffic levels, and avoids the risk of windfall gains or losses. This proposal meets the CAA’s business plan guidance that NERL should consider how uncertainty should be mitigated and managed effectively in the interests of consumers.

Customers requested further information on the traffic modulation proposal so that they can understand how the targets might be adjusted to ensure the incentive remains consistent and appropriate.

Further detail on our capacity targets, including the proposed modulation mechanism, is provided in [Appendix E](#).

Environment

In 2020, the UK aviation industry, including NATS, made a commitment to net zero emissions by 2050. Customers and passengers indicated their support for ambitious environmental targets.

Indeed, environment was the highest priority identified by passengers, after safety. There was a clear indication that they want us to deliver more efficient flight paths to reduce CO₂ emissions.

To meet our contribution towards net zero, our plan targets a reduction of 4.4% between 2020 and 2035. This is in line with independent assessments of the contribution air traffic control can make to overall aviation emissions reduction⁷ (estimated between 4%-6%).

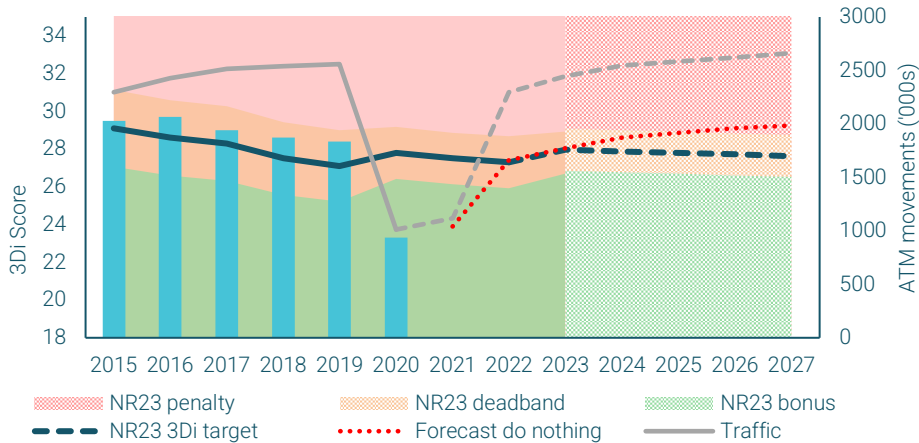
We will achieve this through a range of measures including optimising flight paths to reduce airlines’ fuel burn and CO₂ emissions and delivering airspace modernisation. This will sit alongside the benefits of our current environmental programme, which has delivered annual emissions savings of around 1.5 million tonnes of CO₂ each year compared with 2006 levels.

We will measure our environmental performance through our 3Di metric. This compares the vertical and horizontal path an aircraft flies with a theoretical ideal to assess efficiency. The combined figures for all flights indicate the efficiency of UK domestic airspace. Our historic performance and forecast for NR23 is shown in the chart and table below; the start point was determined by modelling the relationship between 3Di and traffic levels, with annual improvements applied which reflect assumed benefits of operational improvements and our capital investment portfolio. As a result, we will achieve a reduction in 3Di, even as traffic levels grow. Further information on how the targets have been

⁷ [Destination 2050. A Route to Net Zero European Aviation](#), Royal Netherlands Aerospace Centre, [SEO Amsterdam Economics](#) assesses the intra-EU (including UK) ATM reduction potential of 5.1%, and 4.4% excluding improvements to aircraft emissions on the ground.

established, including the linkage with the investment programme is provided in [Appendix E](#).

Without these annual improvements, enabled by other aspects of our business plan, 3Di performance would deteriorate as traffic recovers; this is shown in the ‘do nothing’ line in the chart.



Projected 3Di performance

Metric	Lower threshold	Target	Upper threshold
2023	26.8	28.0	29.1
2024	26.8	27.9	29.0
2025	26.7	27.8	28.9
2026	26.6	27.7	28.8
2027	26.5	27.6	28.7

Summary of 3Di targets

We have also put forward a traffic modulation mechanism, which would adjust targets to take account of the impact of changing traffic levels. This is based on the strong relationship between traffic volumes and 3Di performance, and would prevent windfall gains or losses through

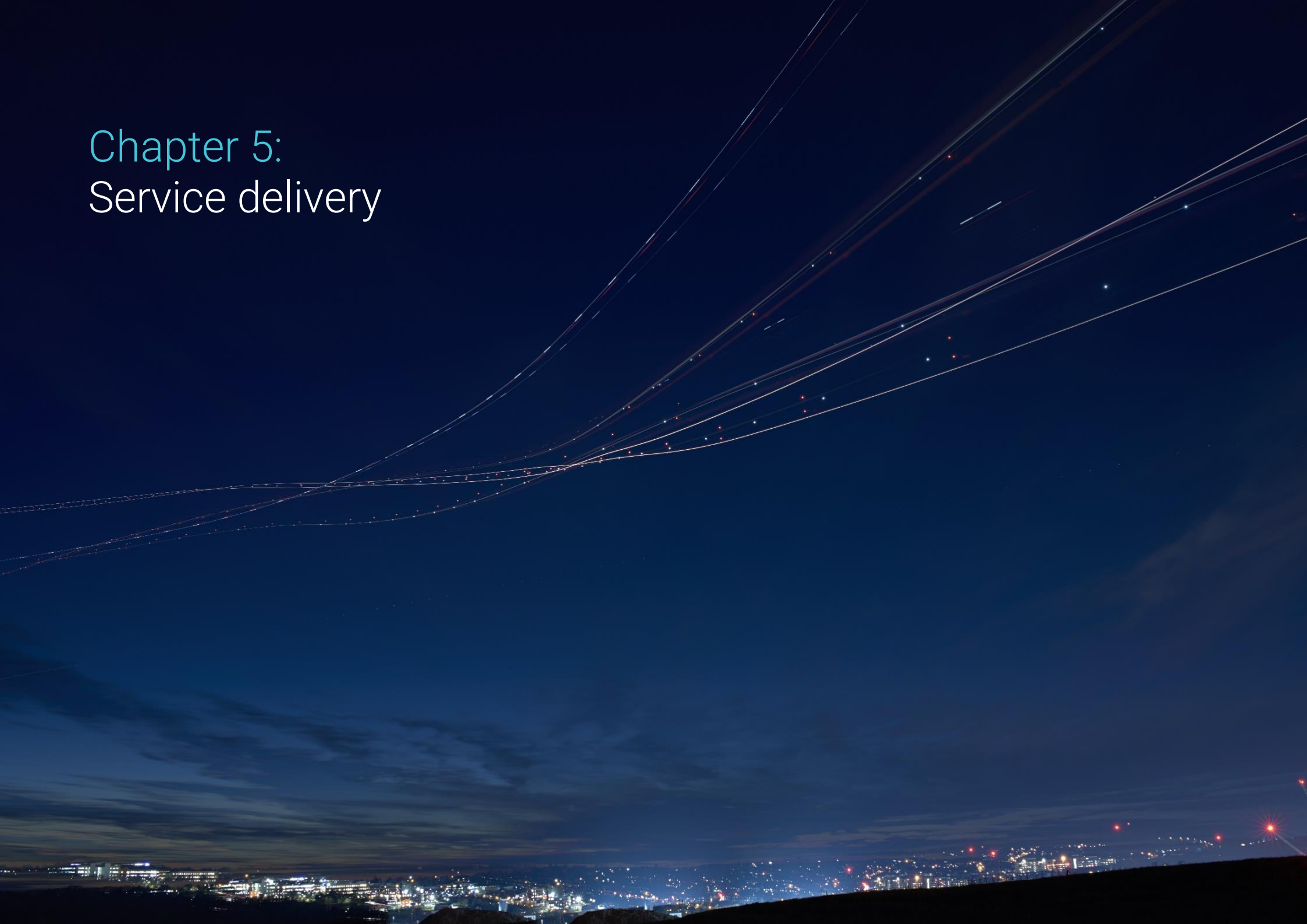
the service incentives attached to 3Di – especially in the context of the range of uncertainty in the traffic forecasts. This proposal meets CAA business plan guidance that NERL should consider how uncertainty should be mitigated and managed effectively in the interests of consumers.

However, there was no support from customers for NERL’s proposal for an increased financial incentive for 3Di performance; customers favour the current balance of delay to environmental performance incentives.

NERL’s proposal for a traffic modulation mechanism was not endorsed as further information about the linkage with the investment programme was required. NERL has committed to work with airlines and the regulator on how our environmental performance should be measured in the future.

Further detail on the 3Di metric, the targets, links to net zero emissions and the capital investment portfolio, and the traffic modulation mechanism is available in [Appendix F](#).

Chapter 5: Service delivery



Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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Operational resourcing

Our operational resourcing requirements are inseparable from the targeted service outcomes. Traffic forecast uncertainty, the need for resilience, and the requirement to replace the highest number of retiring ATCOs in any regulatory period are further defining factors in NR23.

- › **Resilience:** Resilience is fundamental to this plan. In 2021, the CAA found NERL in breach of its licence due to a lack of staffing resilience on Essex airspace⁸. To ensure we have the appropriate number of ATCOs and mix of sector validations, both the volume and composition of returning traffic will be constantly monitored to understand if there are any differences vs our resourcing plans.
- › **Demand:** We must have resources to deliver a safe operational service at an appropriate performance level for the expected traffic forecast. The base case forecast projects around 16% growth across the NR23 period. This would represent the largest ever growth over a five-year plan period (eg we handled 14% traffic growth between 2014 – 2019 for RP2).
- › **Retirement:** It is not yet known what impact the pandemic has had on individuals' retirement plans. There is no fixed retirement age for ATCOs, and notice periods are relatively short, while training lead times are long. Based on age demographics, we expect around 25-35% of our current ATCOs to retire by the end of NR23. This will require careful planning and management to avoid staff shortages.

Parallels to funding resilience in the wider aviation sector

There are other examples in aviation of organisations having to invest to avoid potentially material/long-lasting impacts from under-supply (delay, schedule disruption). Examples include:

- › easyJet reported increased disruption costs from compensating passengers for long delays in the years to 2018. They responded by refining schedules, and investing in ground handling to deliver first wave punctuality, and in standby aircraft, crew and spares⁹.
- › In September 2017, Ryanair experienced a rostering failure which ultimately affected 0.7m passengers in subsequent months¹⁰. They responded by improving operational management and increasing employment costs to recruit and retain pilots.
- › At Gatwick, on-time departure performance declined in 2014-16, due to several factors including staffing problems experienced by ground handlers. The airport invested significantly to incentivise airlines and handlers to meet on time targets¹¹.

The large drop in traffic and social distancing requirements to keep staff Covid-safe during the pandemic have adversely impacted ATCO training. Unit based training stopped for 13 months as it is dependent on having sufficient traffic volumes and complexity in the operations room. This, as well as the need to reduce cash expenditure within the business, resulted in a recruitment freeze and temporary closure of our controller training facility for two years. This is where new recruits gain a student licence before completing their training in an operational unit.

To optimise the efficient throughput of new controllers to replace those that we expect to retire, we plan to restart initial controller training in February 2022. This will maximise the use of the training facility and

⁸ CAA 2021, Investigation under s.34 of the Transport Act 2000: Project Palamon – Final Decision, CAP 2100, pp. 10-12

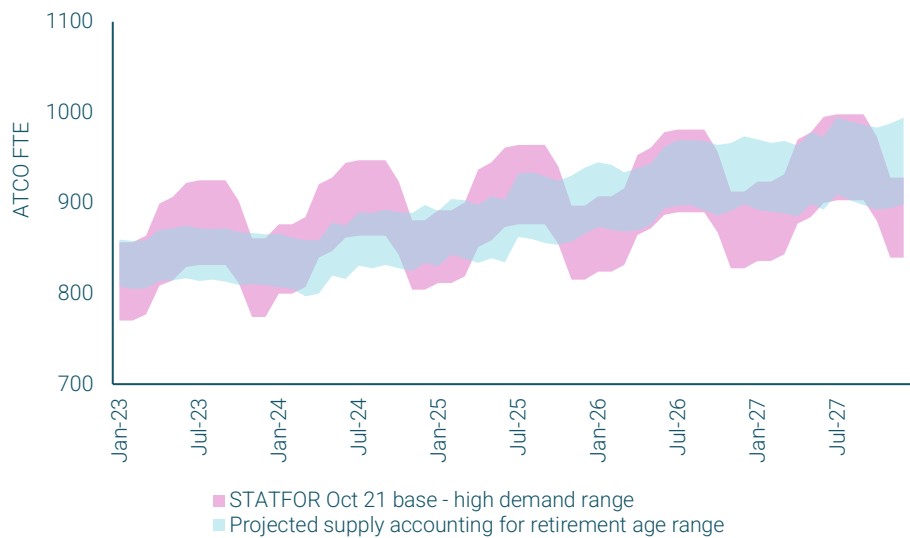
⁹ easyJet full year 2019 investor presentation

¹⁰ Ryanair H1 FY18 Results presentation

¹¹ Gatwick Airport Limited, GAL's finalised, extended Commitments, January 2020

unit training in all years leading up to and throughout NR23; we will train at capacity throughout NR23, and have designed our plan to ensure that unit based training is continually running at 100%.

New controllers are initially only valid for a single operational role, in contrast to retiring controllers who build up multiple validations over time. This reduces flexibility in our roster and is reflected in our operational resourcing requirements.



Projected ATCO supply and demand

The chart on the left shows the STATFOR October 2021 demand (base case and high case) and projected range for supply in NR23 given retirement age uncertainty. Our core supply plan meets base case demand in all years of NR23 albeit there is a risk it will not be met, should more controllers retire than currently assumed, which we will monitor and manage carefully through NR23.

Uncertainty about traffic recovery drives a significantly higher degree of divergence between traffic forecasts than in previous planning cycles; the high case forecast projects traffic will be 14% higher vs 2019 by 2027, compared to just 2% in the base case. Should high case traffic materialise, we would take every measure to ensure we continue to provide an efficient service to all flights. However, it is important to recognise that the enforced suspension of training activities in 2020/21 and action taken to reduce costs, mean there would be significant challenges. It is very likely that we would not be able to meet our proposed service quality targets at high case traffic level, particularly in the early part of NR23; based on the proposed traffic modulation mechanism, we estimate that delay could increase by around 5-7 seconds per flight. We intend to continue to engage with customers through the SIP process on the evolution of traffic and associated service implications.

A level of overtime is assumed within our plan as an efficient means of supporting the capital investment portfolio, training new controllers and mitigating temporary shortfalls, such as short notice sickness. We have not assumed a level of overtime within our long-term resource planning to deliver the operational service.

Further information on our operational resourcing plans is available in [Appendix G](#).

Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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Responding to uncertainty

Our resource plan balances resilience with efficiency and will be supported by initiatives to enhance our flexibility to respond to the varying pace and pattern of traffic recovery, as detailed in our response to Palamon.

During consultation, customers supported our approach to plan for a margin of resilience to accommodate the potential for traffic to grow beyond base case projections and a full-speed return to training. However, there was concern that capacity may be constrained by operational resourcing during the recovery from the pandemic, with a request for how this would be mitigated.

As described above, should it become clear as NR23 progresses that demand will be significantly higher than forecast, generating a gap against supply, we will evaluate mitigations such as targeted overtime and incentives to delay ATCO retirements.

Conversely, should traffic fall below expectations, recruitment of new ATCOs could be reduced. However, we believe this would represent a false economy for airlines, unless it was clear that traffic levels would be substantially lower than the forecast for an extended period of time. Fewer controllers would lead to greater variability and unpredictability in service performance and would reduce resilience in handling traffic variability. Higher levels of delay would generate indirect costs for customers and passengers. It would also cause delays to our airspace and technology programmes, slowing the delivery of benefits for airlines and passengers.

Further details of how we could respond to different levels of traffic is provided in [Appendix Q](#), in line with the CAA's guidance for NERL to show how variance in traffic forecasts drives costs and service outcomes.

Training plans

Significant work is underway to improve training performance and capacity to increase our success rates and deliver a predictable supply of trainees across the operation. As described above, we will be running our training college at maximum capacity to ensure we can manage traffic of 94% vs 2019 at the start of NR23, rising beyond 2019 levels by 2025.

Our plan also includes £15m investment in our training and simulator capability. The primary benefit of this investment will be the ability to deliver controller training consistently and predictably, and reduce our dependency on training in the operations room. By using technology and synthetic environments, we will be able to increase the number and quality of trainees validating as operational controllers. The benefits include a 12 month duration for unit training at our operational centres, improving success rates from around 75% to 100% and halving the duration of operational conversion training. This would assure our training pipeline, provide greater agility to respond and adapt our supply to meet material changes in traffic, and reduce the duration and cost per trainee.

We received broad support from customers for this proposal during the consultation. However, customers requested greater clarity on the benefits; further detail is provided in [Appendix G](#).

Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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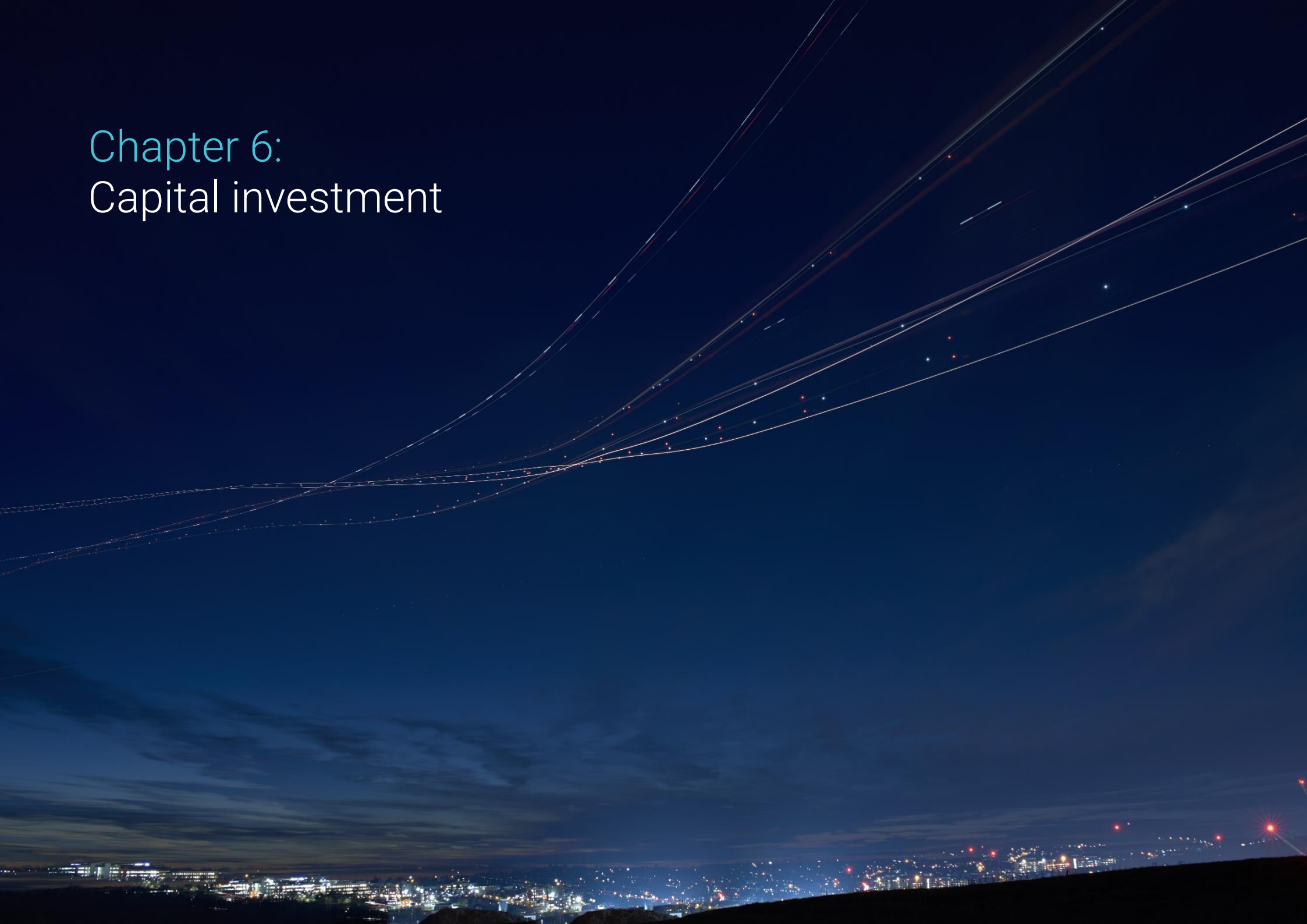
Technical systems and resilience

Our technical infrastructure is supported by our own staff and a series of licences and service support contracts. The overall costs to maintain technical systems will reduce over time as legacy systems are turned off. Further detail is provided in [Appendix H](#).

Our technology transformation programme has also re-aligned processes across our engineering community, reducing the need for specialisms. This enabled us to reduce headcount by almost 200 FTEs through the voluntary redundancy programme, saving around £20m per year.

Our plan includes substantial cyber-security improvements. We are working with the National Cyber Security Centre and the CAA to respond to the continually changing threat. Our plan integrates these costs into service contracts.

Chapter 6: Capital investment



Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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Approach and strategy

In response to Covid-19, we paused much of our capital investment portfolio to address our significant liquidity challenge and reduce on-site attendance in line with Government guidance.

Before restarting this programme, we engaged with customers to reassess future needs considering the impact of the pandemic. Our revised plan was agreed through the SIP process. It takes account of the resources and skills available to us and the ability of our suppliers to scale up following Covid-19. Fundamental changes to the plan include:

- › Extending the delivery timeframe for new technology, increasing the need to sustain the resilience of legacy equipment
- › Reducing capital expenditure to around £100m-£120m pa, in line with our capacity to implement change in NR23

Our programme is designed to ensure we can meet our service performance targets, deliver customers' priorities and provide the necessary capacity for future demand. It takes account of customer feedback from our SIP consultations.

NR23 capital investment portfolio

Our proposed capital investment in NR23 falls into three categories, with around half the total spend focused on technical transformation, as follows:

- › **Sustainment of existing technology:** This is critical to providing a safe and resilient day to day service in NR23 and to meet our service performance targets. As well as maintaining resilience and redundancy of current systems, this investment also addresses increasingly sophisticated cyber threats.
- › **Technical transformation:** The strategy to replace our ageing systems with more modern technical solutions across several regulatory periods was agreed and started in RP2 and reconfirmed with customers in recent SIP processes. DP En Route and Voice is now 80% complete and will enhance resilience of the critical national infrastructure, increase network capacity for future traffic growth, provide safety and environmental benefits, and deliver new capabilities and efficiencies.

The next scheduled major milestone is the replacement of part of our voice communication system (planned for 2022), followed by the new platform and architecture supporting our upper airspace (DP En Route) operation. These milestones will be delivered in NR23 and will also enable airspace modernisation.

Our original RP3 plan also included investment to replace the systems supporting our lower airspace operation. As described above, the impacts of Covid-19 mean that this timeframe is no longer feasible, and this is reflected in the reduced level of expenditure.

- › **Airspace network modernisation:** This is a major component of the UK's overall airspace modernisation strategy. Its delivery depends on the masterplan that the Airspace Change Organising Group

(ACOG) is developing as well as third-party change sponsors, primarily airports.

Based on customer feedback, planned investment will systemise UK terminal airspace, deliver free route airspace and enhancements to the way we manage traffic flows.

Our implementation of cross-border free route airspace is dependent on the technical capability deployed through our DP En Route and Voice programmes. For all other airspace changes we will align airspace solutions with the available technology, including our existing systems where sustainment activities enable this, and evolving airspace design to exploit the future technical platform as it becomes available, delivering benefits progressively.

Our plan also includes a range of other investments covering the oceanic service, training and simulation enhancements, plus our estate and business IT.

The key milestones for the capital investment programme during NR23 are shown below.

Programme	Date	Milestone
Airspace	Q1/Q2 2023	1 st FASI deployment (West Airspace Deployment)
Technical transformation	Q3 2023/Q3 2024	Prestwick upper airspace FOS
	Q3 2024/Q2 2025	Swanwick Area Control FOS
Airspace	Q2/Q4 2025	FASI Scotland
Airspace	Q4 2025/Q4 2026	Free route airspace cross border
Airspace	Q1 2026/Q4 2026	FASI Northern England

NR23 capital investment portfolio milestones

During customer consultation, we proposed several options for further investment. As described in [Chapter 2](#), there was broad support from customers to improve our operational training capability to respond more rapidly to changes in traffic. This option has therefore been included in our plan, and further detail on the benefits is provided in [Appendix G](#).

We also presented options to vary the scope and scale of our capital investment portfolio in NR23. While customers supported these, subject to further consultation on costs and benefits, we have not yet added them to our plan, agreeing with customers that we would continue to develop and consult on them via the SIP process.

There was no support from customers to reduce the size of the capital investment portfolio as this was contrary to the strategic goals for airspace and technology modernisation. Further information on the options can be found in [Appendix H](#).

Financials

We have proposed a plan that strikes a balance between priorities and benefits, costs, deliverability and service risk, with a total investment of £574m (2020 CPI prices).

Programme	£m low	£m base	£m high
Airspace	70	83	100
DP En Route	38	38	40
Technical resilience	195	206	235
Lower technical operation	120	120	170
Other	124	127	135
Total	547	574	680

Estimated costs for proposed NR23 capital investment costs (range, 2020 CPI prices)

Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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Benefits

Our NR23 plan will deliver a range of benefits to customers, including technical resilience, safety, service quality, reduced CO₂ emissions and fuel burn, cost efficiency and legislative compliance.

- › **Sustainment of existing technology:** will ensure continued safe operation of our current systems, mitigating technical resilience risk and cyber-security risk.
- › **Technical transformation:** this is critical to future capacity and environmental improvement, as well as the route away from existing ageing systems, reducing technical resilience risk and cost.
- › **Airspace network modernisation:** will enable optimised cross-border flight planning, deliver fuel and CO₂ benefits, help alleviate bottlenecks/congestion points and reduce controller workload to support safety enhancements or capacity increases. We also expect that our airspace modernisation investments will increase UK network capacity by 4%-8% during NR23.

Our service targets for NR23 (described in [Chapter 4](#), and [Appendix E](#) and [Appendix E](#)) take into account the delivery of these benefits.

A summary of the benefits of our capital investment programme is shown on the right. These are our current initial estimates of benefit ranges we expect to deliver in NR23 and will be clarified as we develop our programmes and projects in NR23.

Further detail on the benefits of our capital investment portfolio is provided in [Appendix H](#).

	2023	2024	2025 - 27	Overall contribution
Safety (RAT) % reduction / 100k movements	3 - 6%	10 - 12%	6-12%	18-27%
Service impact C2 (seconds per flight)	0	0	0.7-1.2	0.7-1.2
3Di (score)	0-0.3	0.9-1.5	1.1-1.5	2-3.3
Technical resilience risk	Maintain exposure at a tolerable level (below £90m NWV)			
Cost efficiency	Minimise impact to medium term costs, drive long term efficiency in cost base (see implications for operating cost, below)			
Compliance	Targeting compliance across period			

Overall portfolio benefits

Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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Comparison to RP3 plan

Our RP3 plan continued the Deploying SESAR strategy that began in RP2 to replace our ageing systems, with key milestones to deliver transformation in upper airspace (DP En Route) in 2020-21, followed by transition onto the Common Platform (DP Lower) by the end of 2024. Following a period of dual running, this would enable 'legacy escape' by transitioning all technical systems onto a single common platform, and would deliver a significant reduction in costs and headcount.

To mitigate the impact of Covid-19, we took decisive actions to reduce cash spend, including pausing non-essential investment for six months, releasing contractors, letting go of around 200 employees through a voluntary redundancy programme and moving to a 'fix on fail' approach for sustainment. As a result of these actions, capital investment in the revised RP3 timeframe (2020-22) is around £230m lower than in the RP3 plan across the same period. This, together with the ability of our suppliers to scale up following Covid-19, has extended the timeframe to deliver new technology. At £574m (2020 CPI prices), our NR23 plan is around 25% lower than the original five year RP3 plan (£769m).

The impacts are as follows:

- › **New technology:** DP En Route is now projected to be completed in 2025, while transition to the Common Platform (and therefore 'legacy escape' will be completed in mid-NR28). This delivers a £49m saving in 2020-22, but leads to £23m higher costs overall across 2020-27
- › **Sustainment:** The move to a 'fix on fail' approach has saved around £34m in 2020-22 vs the RP3 plan, but the consequences of that approach (a smaller investment plan and revised transition period to the Common Platform) are reflected in our investment profile to maintain a safe, resilient service with our current systems changing our sustainment spend across 2020-27 by around £114m

- › **Airspace:** We now expect to spend £80m less] in 2020-22, and £48m less across 2020-27. This reflects the pace of delivery that can be achieved within a smaller overall change capacity, and is aligned with ACOG and other major stakeholders. The airspace investment takes account of customer feedback on the highest priority airspace changes

Implications for operating costs

In our pre-Covid plan, we anticipated that we would move off our current technology by the end of RP3, and that this would generate cost savings by ending dual running, concluding external support contracts and reducing headcount.

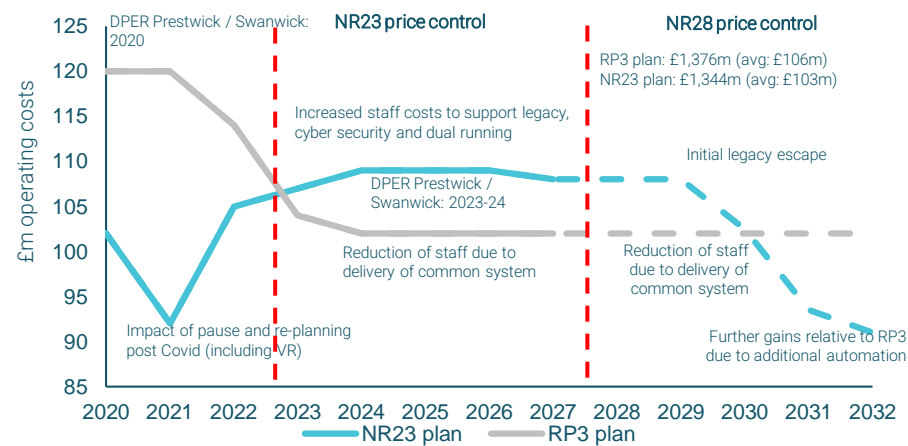
However, the re-shaping of our capital investment portfolio following Covid-19 means that new systems are entering into service later than originally anticipated, while old systems must be maintained for longer. This has changed the timeline of the associated costs compared with the RP3 plan.

Overall, customers will benefit from £25m saving across 2020-27 as a consequence of the investment pause and timing differences for investment. This is driven by:

- › £55m operating cost saving in 2020-22 relative to the RP3 plan, facilitated by the VR programme which has enabled a shift to new ways of working and greater automation, together with the deferral of implementation costs for new systems due to the capital investment replan
- › £30m of higher costs in 2023-27 than anticipated in the RP3 plan due to dual running commencing later, and lasting for longer, than previously assumed following the capital investment replan

Additionally, the benefits and savings from previously anticipated headcount reductions and ending external service contracts following 'legacy escape' will now be delivered in NR28. This will provide savings

of around £10m pa relative to the RP3 plan. Beyond that point, we expect that greater levels of automation will drive lower costs later in NR28 as we leverage the capabilities of the common platform and optimise the delivery of services. Further detail is in [Appendix H](#) to meet CAA guidance that NERL should identify the operating cost effects of changes to the capital investment portfolio.



Evolution of Technical Services operating costs

Governance

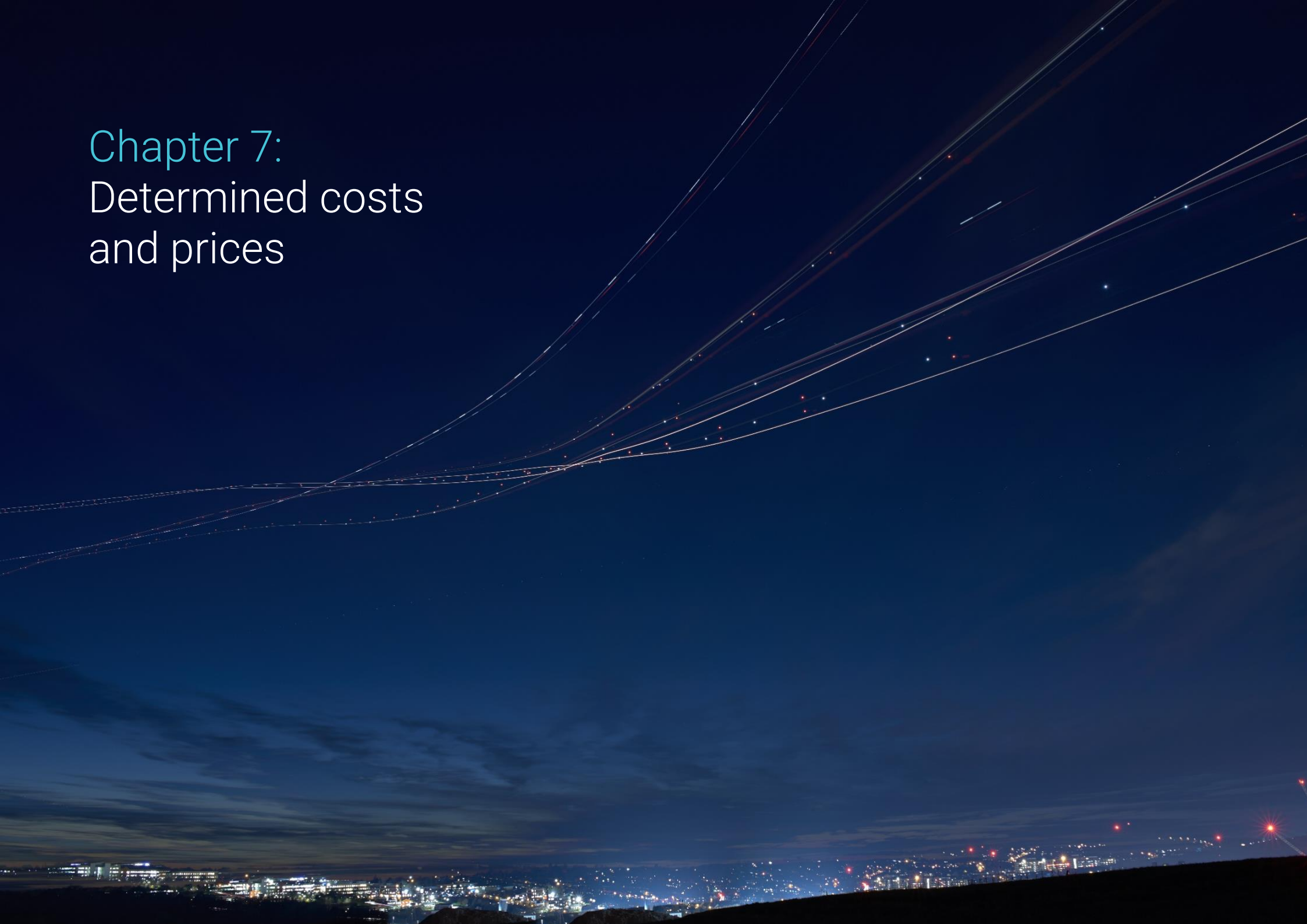
Our plan assumes that capital governance will continue as per the RP3 determination, including the cost efficiency and customer engagement incentives in our licence.

Building on progress made during RP3, customers and the CAA’s independent reviewer support a more flexible capital governance mechanism. This approach recognises the requirement to provide sufficient detail for the price control, while also enabling us to respond to the changing external environment and to offer choices to customers on an ongoing basis.

We will continue to use a fixed two-year plan, governed through the SIP, with a flexible five-year investment roadmap agreed through the price control process (‘2+5 process’). This will enable us to develop rolling two-year detailed plans, while collaborating with customers on strategic intent and preferred options to support resource and financial planning for future years. Planning future years at a more strategic level will facilitate discussions about longer term options and benefits for customers.

At the consultation, airlines supported this approach, noting the ‘2+5 process’ would help ensure that the capital investment portfolio is sufficiently well-defined on a rolling basis, and that there is alignment between the different customer engagement processes.

Chapter 7: Determined costs and prices



Our cost base projections started from the lowest ever baseline in 2020 and 2021 due to Covid-19. To preserve liquidity, and to ensure the uninterrupted running of the operation throughout the pandemic, we reduced our cash outgoings by over £500m relative to the RP3 plan. Our response is described fully in [Chapter 1](#).

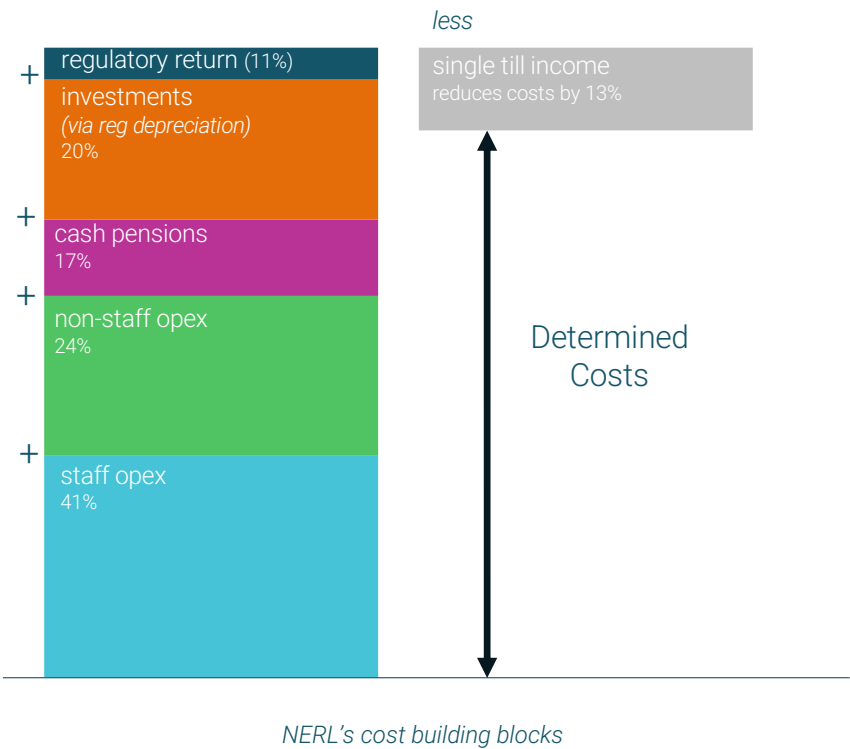
We have built around £70m pa sustainable cost savings into the NR23 plan. However, our cost base will increase from its low starting point as the aviation industry begins to recover and as traffic levels rise. Many of the cost pressures which featured in our RP3 plan in 2018 feature again in our NR23 plan as these requirements are unchanged. This includes the costs of dual running (maintaining old systems while developing and deploying replacement technology), maintaining new systems, increasing cyber-security and drone requirements, and funding our largest ever controller training programme. As foreseen in the RP3 plan, and exacerbated by the impacts of the pandemic, we project a reduction in single till income opportunities.

There are also several new cost pressures. At the time of writing, inflation is at its highest level in ten years, contributing to wage inflation in the general economy, with technical skills attracting premiums. Covid-19 and Brexit related supply chain issues are leading to rapid price escalation in numerous areas, and we are also experiencing pressures in utilities costs.

Our plan takes account of these challenges, but also builds in sustainable efficiencies. The NR23 cost base is presented fully in the remainder of this chapter using 2019 actual costs as the principal reference point for analysis. This was the most recent pre-pandemic year, and traffic is also expected to recover to 2019 levels by 2025. Where appropriate, we have also compared the NR23 cost base against the RP3 plan for 2020-22.

Determined costs

Determined costs are based on the building block approach, comprising operating costs, cash pensions, regulatory depreciation (to recover investments made in prior price control periods), regulatory return and single till income, as shown below.

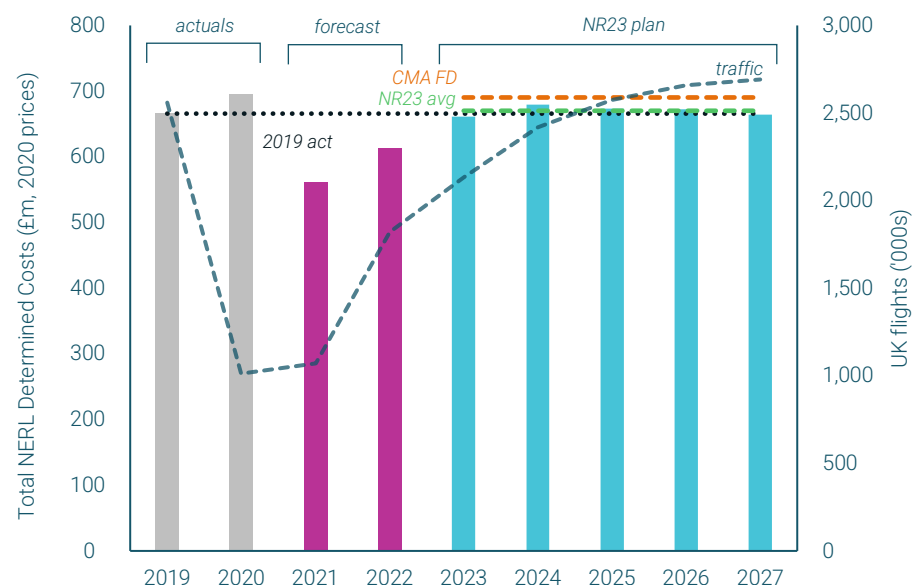


Our determined costs projections are set out below for total NERL, with further detail on the UKATS and oceanic split available in [Appendix I](#).

Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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NERL determined costs	2019	2020	2021	2022	2023	2024	2025	2026	2027
£m (CY, 2020 prices)	actuals	actuals	forecast	plan	plan	plan	plan	plan	plan
Staff costs	286	277	243	256	263	272	275	279	284
Non-staff costs	151	127	121	150	153	157	157	157	153
Exceptional costs	4	56	(20)	2	3	3	3	3	3
Operating costs sub-total	439	461	344	408	419	432	436	439	440
Cash pension contributions (defined benefit-deficit repair)	31	20	20	20	20	20	20	20	21
Cash pension contributions (defined benefit-future service cos	38	49	48	47	67	66	64	63	61
Cash pension contributions (defined contributions)	10	12	12	14	16	17	19	20	22
Cash pension contributions (opt outs)	17	16	13	13	12	11	10	9	8
Cash pensions sub-total	97	98	92	93	115	114	113	113	112
Regulatory depreciation	180	201	165	145	129	138	137	138	137
Regulatory return	59	39	49	54	86	81	76	70	64
Single till income	(109)	(103)	(88)	(86)	(87)	(86)	(88)	(88)	(87)
Total NERL determined costs	666	695	562	613	661	679	673	672	665

NERL's total determined costs, 2019 to 2027



NERL's total determined costs, 2019 to 2027

At a headline level, average determined costs for NR23 are 1% higher (£4m) than 2019 actuals.

Building block	2019 actuals £m	Increase/(reduction) v 2019	
		£m	%
Operating costs	439	(6)	(1%)
Cash pensions	97	17	17%
Regulatory depreciation	180	(44)	(25%)
Regulatory return	59	16	27%
Single till income	(109)	22	20%
Determined Costs	666	4	1%

Increases/(decreases) to NERL's total determined costs, average NR23 vs 2019

Compared to the RP3 plan, average determined costs are around £20m (3%) lower, despite the cost pressures described above. This reflects the benefit of £70m sustainable cost savings delivered through our response to Covid-19.

Building block	RP3 plan, 2020-22 avg £m	Increase/(reduction) v RP3 plan	
		£m	%
Operating costs	479	(46)	(10%)
Cash pensions	98	15	15%
Regulatory depreciation	171	(36)	(21%)
Regulatory return	39	36	92%
Single till income	(97)	10	10%
Determined costs	690	(20)	(3%)

Increases/(decreases) to NERL's average total determined costs, NR23 vs RP3 plan (2020-22)

The changes to our determined costs are summarised below:

- › **Operating costs:** Around £6m (1%) lower pa on average than in 2019, (£46m lower pa than the RP3 plan), reflecting the efficiencies sustained from our Covid-19 response

Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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- › **Cash pensions:** £17m (17%) higher pa on average than in 2019, (£15m higher pa than the RP3 plan), driven by adverse financial market conditions for defined benefit (DB) pensions. These were mitigated significantly by a regulatory policy statement from the CAA, NERL's negotiation with Trustees, and the reduction in staff numbers following Covid-19
- › **Regulatory depreciation:** £44m (25%) lower pa on average than in 2019 (£36m lower pa than the RP3 plan) mechanically driven by assets in place at the public-private partnership in 2001 becoming fully depreciated, and lower levels of capex than planned in RP3¹²
- › **Regulatory return:** £16m (27%) higher pa on average than in 2019 (£36m higher pa than the RP3 plan), mainly driven by the larger Regulatory Asset Base (RAB) due to the regulatory treatment of the TRS debtor and increased tax rates in line with UK Government policy. The vanilla cost of capital value of 3.54%¹³ (pre-tax: 5.31%) is lower than 2019 (4.25% vanilla, 5.86% pre-tax)
- › **Single till income:** £22m (20%) lower pa on average than in 2019 (£10m lower pa than the RP3 plan) due to the renegotiation of the Future Military Area Radar Service (FMARS) contract with the MoD (as explained in the RP3 plan), and lower levels of inter-company demand (whereby NERL provides services to NSL, the commercial subsidiary of NATS, to support sales to third parties), related to the lower cost base and the completion of major contracts and other one-off items

Operating costs

Response to Covid-19

Our response to the impact of Covid-19 generated an average 11% pa reduction in our underlying operating costs in 2020 and 2021 vs 2019 (ie

a measure of our costs, neutralised for pension costs, exceptional items, furlough and external business) in real terms compared to our RP3 plan. This represents a almost 40% reduction since 2001. Underlying costs across the NR23 period will be around 30% lower pa than in 2001 in real terms. This is shown in the chart on the next page.

The actions taken to reduce cash outgoings during the Covid-19 pandemic, described in the summary, have reduced the costs to customers by around £300m.

By contrast, as highlighted in the Performance Review Board (PRB) of the European Commission's October 2021 report¹⁴, most other European ANSPs have not been able to reduce their costs to a significant extent vs 2019 actuals. Although most ANSPs have managed to reduce headcount and salaries to some extent, the only ANSP that reported implementing a VR programme comparable to NERL was Denmark's NAVIAIR.

Quantitative comparisons of actions taken across different ANSPs are challenging due to the absence of detailed financial data for these entities. ENAV is the only publicly listed ANSP and therefore reports detailed cost data that can be used as a benchmark for NERL. Analysis of ENAV's data for 2020 reveals that the most important cost reduction items were variable staff remuneration, which fell due to reduced overtime, the use of accumulated holiday allowances, and lower bonuses for executives.¹⁵ We have also reduced similar costs on a temporary basis while traffic levels are low, but we have gone further, implementing a VR programme and a range of other measures (see [Chapter 1](#)) that have reduced our costs.

Evidence of the extent of NERL's actions to reduce costs can be seen in an analysis of European ANSP cost reporting tables. As a result of our response to Covid-19, our operating cost reductions relative to 2019 for

¹² Under the current regulatory model, the TRS debtor is collected via price adjustments on an N+2 basis not via regulatory depreciation of the RAB

¹³ Vanilla cost of capital comprises pre-tax cost of debt and post-tax cost of equity

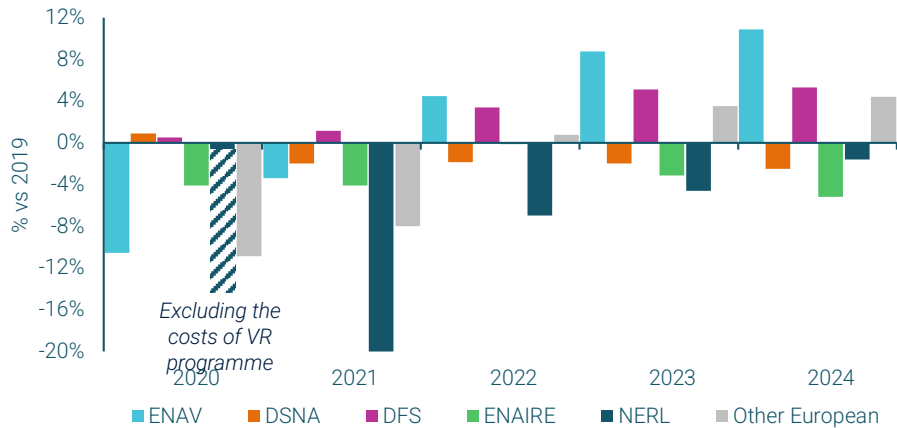
¹⁴ Performance Review Body of the European Single Sky (2021), 'Performance Review Body Monitoring Report 2020', October.

¹⁵ ENAV (2021), '2020 Annual Financial Report', pp. 146–147.

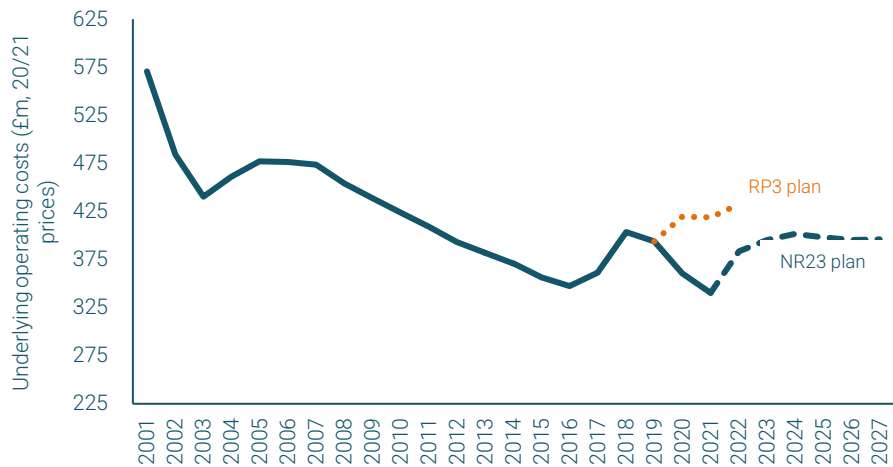
2020 – 2024 benchmark favourably to the other ‘big 5’ ANSPs¹⁶ and the European average as shown in the chart to the right.

The other ‘big 5’ ANSPs reduced their operating costs by an average of 3% in 2020 and 2% in 2021, relative to 2019 actuals. NERL’s operating costs were 14% lower in 2020 vs 2019 (excluding VR costs) and 20% lower in 2021.

In addition, having reduced our costs to a greater extent in 2020 and 2021, we have also been able to achieve sustainable cost savings of a larger magnitude compared to the other ‘big 5’, which will reduce our cost base during NR23. Further information on benchmarking is available in [Appendix O](#).



Operating cost reductions vs 2019, 2020-2024



NERL’s underlying operating costs since PPP

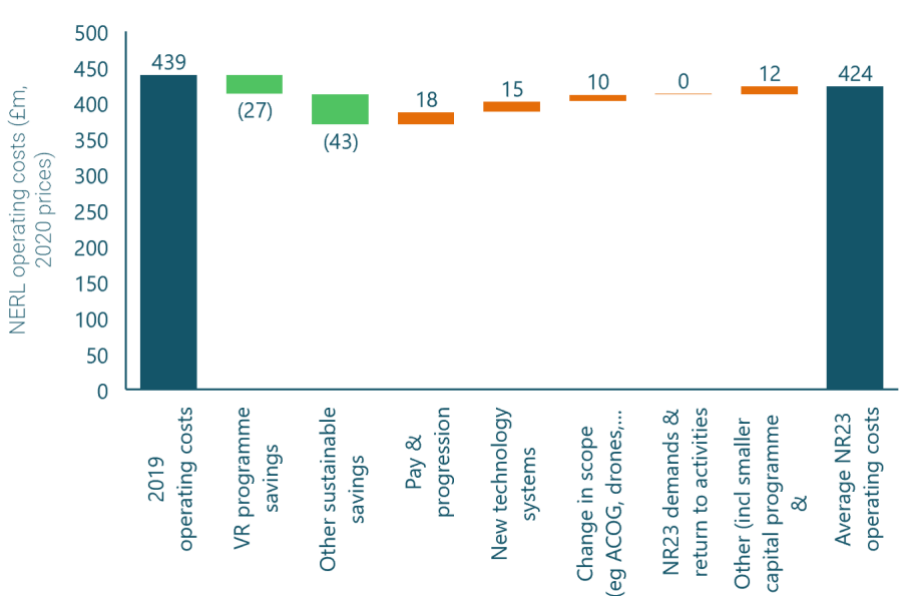
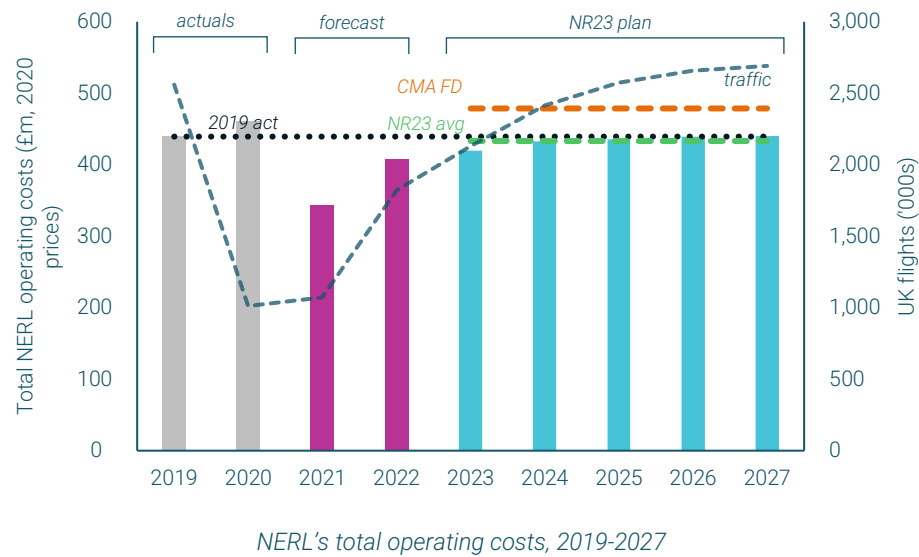
¹⁶ DSNA (France), DFS (Germany), ENAIRE (Spain) and ENAV (Italy)

Evolution of operating costs in NR23

As stated above, average NR23 operating costs are 1% lower pa than 2019, despite unchanged service quality and transformation requirements plus new systems to increase resilience and greater focus on our environmental performance.

While these pressures cause operating costs to increase across the NR23 period, we have managed to contain them overall below 2019 levels, as shown in the chart below, even with traffic forecast to rise through the period, surpassing 2019 levels by 2025.

Average total operating costs are around 10% lower pa than the RP3 plan, reflecting the sustainable savings achieved through our response to Covid-19, and ongoing cost containment measures. These measures, including the VR programme, have reduced underlying operating costs by around £70m pa on average in each year of NR23, relative to 2019.



NERL's average NR23 operating costs vs 2019

Further detail and evidence are provided in [Appendix J](#).

Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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Cash pensions

Average cash pension payments are around £17m pa higher than 2019. This mainly reflects an increase in the ongoing cost of providing a DB pension scheme (£16m pa) as a result of adverse financial market conditions. This is driven by reductions in real interest rates since the RP3 business plan. It has been partially mitigated by the reduction in staff numbers through the VR programme in which 155 scheme DB members, 78 DC scheme members and 113 PCA scheme members left the business, together with other Covid-19 response actions.

DB costs reflect the outcome of the trustees' formal scheme valuation at 31 December 2020. This showed an average ongoing future service cost of 65% of pensionable pay across NR23 and a funding deficit of £172m (or 3% of scheme liabilities) to be met over nine years. This is significantly better than the trustees' initial proposal of an ongoing future service cost of 70% and an initial funding deficit of £455m to be met over six years. This improvement was a result of the CAA's regulatory policy statement (CAP 2119), and our challenge to the level of prudence in the trustees' valuation assumptions and the extent of their regard to the regulatory policy statement.

Further detail on cash pensions costs is available in [Appendix K](#).

Regulatory return

The £16m pa average increase in regulatory return vs 2019 is driven by the increased RAB and an increase in the rate of corporation tax to 25% from 2023, partially offset by a lower post-tax vanilla, real weighted average cost of capital (WACC) allowance than in 2019 (RP2)¹⁷.

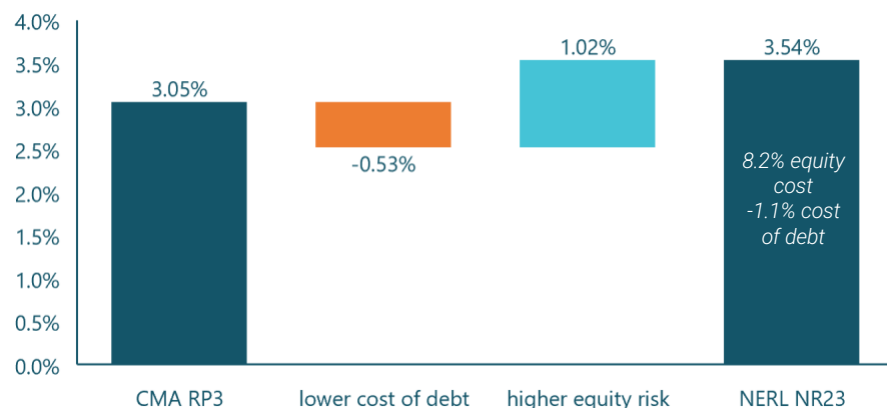
The increase in the average RAB, (+55% from 2019 to 2023 in real terms) is a direct result of the slump in traffic due to the pandemic, with the TRS debtor added to the RAB until it is recovered. We do not distinguish between the underlying RAB, which represents the stock of previous capital investment, and the TRS debtor. The demand, cost and regulatory risks faced by investors that have been factored into the WACC are borne at a company-wide level and do not attach themselves to particular elements of the RAB. Both components of the RAB are financed via a single balance sheet by the same investors, and therefore are remunerated at the same WACC.

The post-tax vanilla real WACC of 3.54% per annum is based on an 8.2% real cost of equity and a -1.1% real cost of debt. Our proposed NR23 WACC is a decrease compared to the 2019 (RP2) WACC but has increased relative to the RP3 determination by 0.49pp (3.54% vs 3.05% post-tax vanilla real WACC), reflecting:

- › An increase in the cost of equity, in response to the higher risk faced since the pandemic by aviation infrastructure providers. This change, combined with a higher gearing ratio, increases the post-tax vanilla real WACC by around 1.0 percentage points
- › A partial offset from a much lower cost of debt, achieved through our 2021 refinancing activity. Combined with higher gearing, this reduces the post-tax vanilla, real WACC by around 0.5 percentage points

¹⁷ RP2 vanilla WACC was 4.25%, the pre-tax WACC was 5.86%.

Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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Post-tax vanilla, real WACC: NR23 proposal vs the final RP3 decision

Our cost of equity estimate follows closely the methodology adopted by the CAA in its initial proposals for Heathrow, and prior to that the CMA's RP3 decision:

- › **Company-specific risk (asset beta):** as per the CMA's findings, we have concentrated on relevant European aviation comparator companies, principally ENAV (as the only listed ANSP) plus four listed airports. We draw data from before and after the start of the pandemic. Our point estimate of 0.68 is higher than the CMA's previous mid-point of 0.57, reflecting heightened investor perception of risk for companies with characteristics similar to NERL's, and ongoing traffic uncertainty.
- › **Market-wide risk (Total Market Return, TMR):** we have selected 5.85%, based on regulatory precedent in the most recent CMA decisions and the CAA's initial proposals for Heathrow.

On gearing, the heightened uncertainty about medium-term demand has created challenges to reach firm conclusions about gearing assumptions for a notional company. Our proposal of 50% reflects current and anticipated gearing levels of NERL, and also the increase in

the gearing by around 20 percentage points of most of the comparator companies since the CMA's decision set notional gearing for RP3 at 30%.

Our cost of debt estimate is based on the actual costs of new debt issued in 2021 as part of NERL's wholesale refinancing. It does not include the costs of retiring early the bonds and the financing structure that had been in place since 2003. These costs are included in our proposals to the CAA for its 2022 cost reconciliation review.

Through our 2021 refinancing, we have taken the opportunity provided by historically low market rates to replace high coupon debt with much lower interest rate bonds, each priced competitively vs the relevant benchmark. We are now able to provide customers with the benefit to determined costs of negative real interest rates.

Our estimate is made in the context of the current regulatory framework, as adjusted by the proposals for NR23 in our business plan.

While our plan is based on the STATFOR October 2021 base case, we note that in its initial proposals for Heathrow's H7 settlement (CAP 2265), the CAA proposes to calibrate allowances for both non-pandemic traffic shocks and for pandemic-magnitude events. This recognises the asymmetric risk associated with traffic risk that does not get compensated for in full within the WACC, and the understanding now of the potential impact and potential frequency of pandemic-magnitude events. As NERL is also faced with such asymmetric traffic risk, the CAA should consider applying for NERL a similar regulatory analysis to that undertaken for Heathrow subject to any necessary adjustment to reflect differing risk exposures.

We will update our WACC estimate once the CAA's initial proposals for NR23 are available in June 2022. Further detail on regulatory return is available in [Appendix M](#) and in the supporting [cost of capital study](#).

Single till income

Single till refers to any income NERL generates from other sources that has the effect of reducing the overall cost base that needs to be recovered from airlines via the regulated en route charge. There are five main categories:

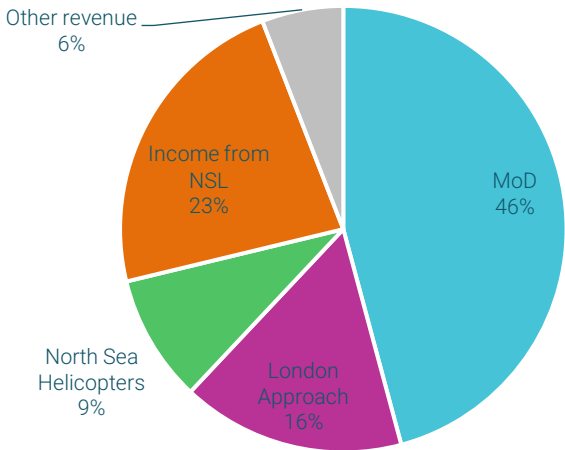
- › **MoD revenue (46% of total single till income):** earned largely through the FMARS contract, this is mainly fixed but does vary with the size of the overall cost base
- › **London Approach (16% of total single till income):** the approach service for London airports, derived as a proportion of the total UKATS determined costs, and regulated through NERL’s licence. The level of income varies with the overall cost base
- › **North Sea Helicopters (9% of total single till income):** service for North Sea helicopters operations, regulated through NERL’s licence and mainly fixed in nature
- › **Income from NSL (23% of total single till income):** includes revenues from inter-company agreements and sharing of central overhead resources, the income depends on NSL’s demand for service and the size of NATS’ corporate functions
- › **Other revenue (6% of total single till income):** commercial revenue earned by NERL trading directly with external customers, there are limited additional opportunities

Single till income is projected to be around £22m pa lower than in 2019. Much of this reduction was presented in the RP3 plan and reviewed by the CMA. Single till income is around £10m pa lower on average than the CMA’s final determination.

This reflects the lower overall cost base in NR23 (vs the RP3 plan) as a driver of several single till income categories, together with a lower level of demand from NSL due to smaller corporate overheads and a reduction in the levels of support needed. For example, the RP3 plan

included a provision for NERL to provide expertise to support NSL’s work on Heathrow Runway 3. This opportunity no longer exists within NR23.

Further detail on regulatory return is available in [Appendix L](#).



Breakdown of NERL’s single till income

Determined unit costs

The en route and London Approach unit costs are presented below. Further information is available in [Appendix I](#). The oceanic service costs are provided in [Chapter 8](#).

En route DUC

Based on the STATFOR base case forecast, the underlying determined unit cost (ie not including price adjustments such as the recovery of TRS debtor) is on average £52 per service unit, or around £2-3 per passenger per flight. This is around £1 higher (2%) than 2019 actuals, reflecting the slightly higher determined costs and the lower average traffic forecast.

The DUC is less than £1 higher than the CMA final determination for RP3; lower average traffic volumes (3%) more than offset the 2% reduction to determined costs relative to the RP3 business plan.

En route Determined Unit Cost	2019	2020	2021	2022	2023	2024	2025	2026	2027
£ (CY, 2020 prices)	actuals	actuals	forecast	plan	plan	plan	plan	plan	plan
UKATS Determined Costs (£m)	644	680	551	594	639	656	651	650	642
Traffic (TSUs, '000s)	12,594	5,106	5,399	10,630	11,722	12,235	12,431	12,649	12,858
En route DUC	51	133	102	56	55	54	52	51	50

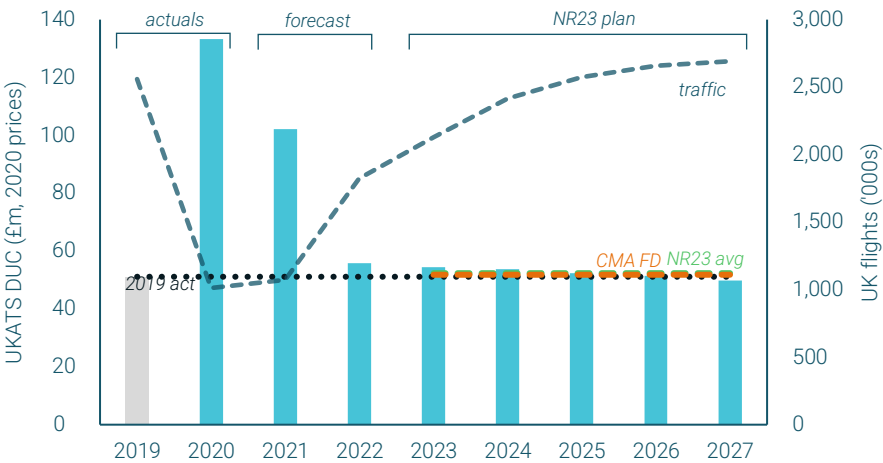
NERL's en route determined unit cost

London Approach

The planned scope of our London approach service in NR23 is unchanged. Supporting data for this assumption is available in [Appendix I](#). The London Approach DUCs are shown below.

London Approach Determined Unit Costs	2019	2020	2021	2022	2023	2024	2025	2026	2027
£ (CY, 2020 prices)	actuals	actuals	forecast	plan	plan	plan	plan	plan	plan
London Approach Determined Costs (£m)	13	12	9	13	13	13	15	15	15
Traffic (TSUs, '000s)	989	399	364	821	926	959	974	991	1,007
London Approach DUC	14	29	26	16	14	14	15	15	14

NERL's London Approach determined unit cost



NERL's en route determined unit costs

In CAP 2291, the CAA asked us to set out our actual/forecast cost baseline for 2020-22, and explain differences to the CMA FD as part of the process to adjust the TRS mechanism and reset charges. We therefore understand that the cost reconciliation should apply equally to London Approach. We estimate that this would add around a further £2 pa to the London Approach charge in NR23, assuming that 75% of the TRS debtor is recovered in NR23, with the remaining 25% recovered in NR28.

Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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En route prices

We are committed to supporting the recovery of the UK aviation industry, our airline customers and UK plc, and we expect the next few years will continue to be challenging. The CAA's business plan guidance asked us to consider how uncertainty due to the impact of the Covid-19 pandemic should be mitigated and managed effectively in the interests of consumers. We therefore presented options to reduce prices charged to customers in NR23 by up to £330m, for consideration by customers at the consultation:

- › **Reprofiling prices within NR23:** A range of options to adjust phasing within the NR23 period, without changing the underlying determined costs
- › **Reprofiling prices across NR23 and NR28:** Deferring the recovery of some regulatory depreciation into NR28 and extending the period for the recovery of the TRS debtor

The options we put forward aimed to modulate prices over 2023-27, with some options to align price levels more closely with forecast traffic during the period. This is in addition to the immediate deferral of the TRS debtor for 2020¹⁸, as well as our embedded actions which reduce determined costs.

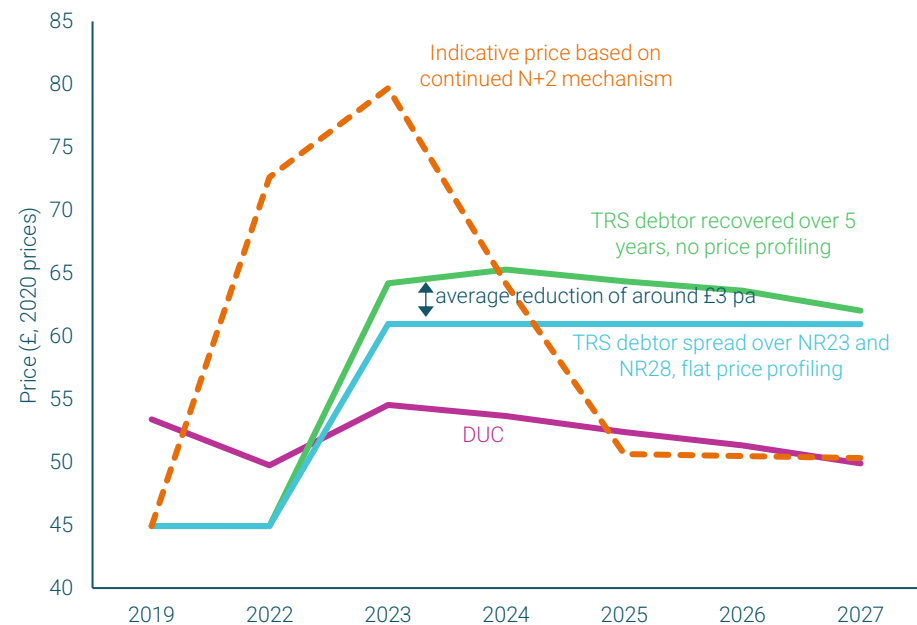
There was no consensus among customers on the proposed options; on profiling within NR23 there were mixed (and directly opposing) views on whether we should adopt a price profile which stayed low while traffic was recovering and then increased, or a profile in which prices start high and reduce over time as traffic recovers. On profiling across NR23 and NR28, there was some support, but not universal, for spreading the recovery of the TRS debtor over a longer period. There was limited support to defer regulatory depreciation or other costs into NR28.

Following this feedback, and noting that price was not a priority for passengers compared to other factors, we have put forward a pricing profile which we believe is in line with the CAA's objective to moderate the impact on prices arising from the pandemic and thereby support recovery in aviation, takes into account the latest traffic forecasts, and meets financeability tests. Our proposal does not go as far as the options put forward during the consultation process, in line with customer feedback. Our proposal is as follows:

- › **Maintaining low prices in RP3:** In contrast to other European ANSPs, our prices for the RP3 period (2020-22) have remained flat at around £47 per service unit. The average increase of the other Big 5 ANSPs is around 10% in 2022, as a result of the EU resetting charges from 2022 rather than 2023 as in the UK
- › **Spreading recovery over NR23 and NR28:** Our plan assumes that 75% of the TRS debtor is recovered in NR23, with the remaining 25% recovered over NR28
- › **Profiling prices:** Our plan has constant prices each year (in 2020 prices), meaning that prices are kept lower in the early years of NR23 than they would be otherwise, supporting the recovery of the wider aviation industry.

¹⁸ The recovery of the 2020 TRS debtor on an N+2 basis was suspended in autumn 2021 (CAP 2279)

As a result of these changes, NERL’s portion of the en route unit rate in NR23 is a constant £61 per service unit (2020 prices). The average price would have been around £64 per service unit (2020 prices) had we recovered the TRS debtor over 5 years, falling from a peak of £65 in 2024 to £62 in 2027. The total amount deferred from NR23 to aid airlines is around £180m.



En route unit rate showing impact of spreading TRS debtor recovery and profiling prices

Assumptions underpinning our NR23 business plan pricing proposals

- Our ability to maintain prices at £61 (2020 prices) over NR23, and the NR23 business plan more generally, is highly dependent on the traffic forecast and actual traffic, as well as a number of key financial assumptions within our plan:
- › the estimated cost of capital (which itself recognises the existence of the large TRS debtor balance)
 - › our other determined costs
 - › the application of an appropriate regulatory return on the TRS debtor, along with adjustments for inflation over the period of its recovery
 - › our assessment of the CAA’s approach to the cost reconciliation exercise (that will take place in 2022).

Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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Financeability

Our financial resilience was critical in ensuring the ongoing provision of the necessary ATC component of aviation in the UK during the Covid-19 pandemic and enabled us to support the sector further by injecting £0.9bn of liquidity.

The foundations for this resilience are represented by the stability of the regulatory framework and the approach that we have taken in relation to dividends and gearing. The stability of the regulatory framework has been tested by the impact of Covid-19 on traffic. However, banks and bondholders remained sufficiently confident that key elements of the regulatory framework would remain. Such ongoing stability within the regulatory framework was therefore crucial for us to secure the lower cost new bonds as part of this refinancing activity from which customers benefit in terms of a lower WACC for NR23, and it remains critical to our future financeability. As a result of the impact of Covid-19, our projected gearing at the start of NR23 is expected, under base case assumptions, to be [3< redacted] vs our Licence cap of 65% and gearing of just 29% on 31 March 2020.

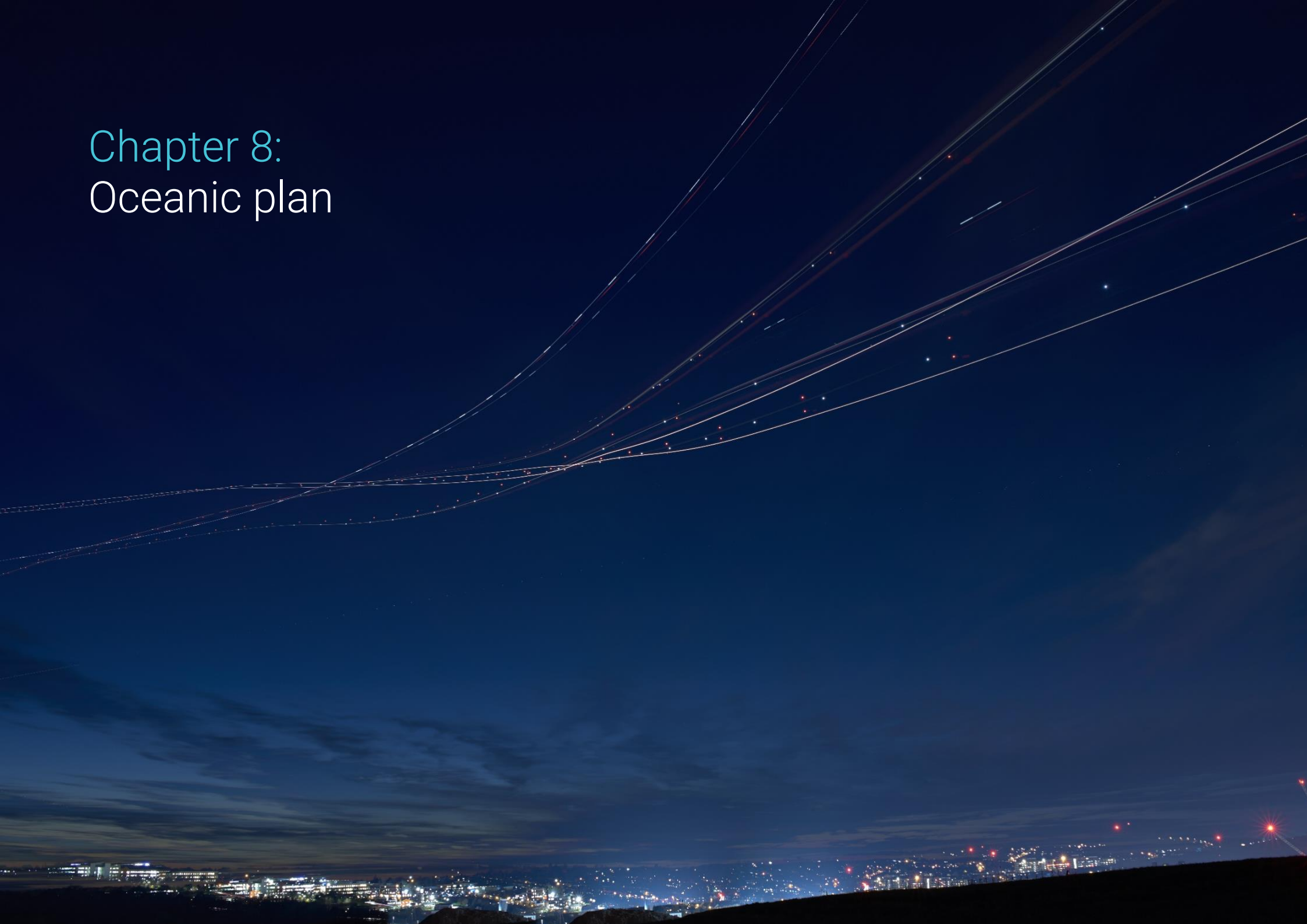
Our proposal to defer part of the TRS debtor to NR28 takes account of both the customer feedback, as well as what is possible in terms of financeability. The proposal is forecast to reduce aggregate prices over NR23 by £180m, relative to recovery of this debtor over NR23 alone. This is equivalent to reducing average prices by £3 pa or 5%.

Having undertaken downside scenario testing, we are satisfied that our proposals ensure our ongoing financeability by retaining sufficient financial resilience to withstand highly credible shocks, most notably in relation to future traffic.

Under these downside scenarios, our average gearing remains within a range of 51% - 58% and our maximum gearing ([3< redacted]) is within a range of [3< redacted]. Results indicate that we have the least

headroom at the start of NR23, when we are likely to be most exposed to further shocks. Further detail is provided in [Appendix N](#).

Chapter 8: Oceanic plan

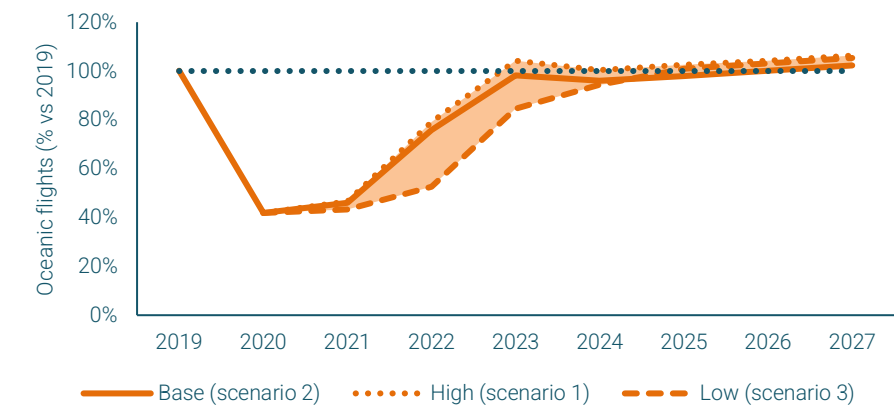


The plan for our oceanic service in NR23 is largely unchanged from the RP3 plan. This includes the continued use of ADS-B to support improved service delivery and compliance with the ICAO target level of safety. The findings of the passenger research point towards a clear preference to invest in these safety benefits rather than reduce prices.

Capital investment will focus on alignment with our oceanic gateway partners and delivering the improvements agreed in ICAO’s Vision 2030 for the North Atlantic. Finally, we propose a new risk sharing mechanism that will more closely mirror en route, to avoid windfall gains/losses for NERL/customers if traffic outturn diverges from forecast.

Traffic forecast

Our oceanic traffic forecast is based on the STATFOR October 2021 base case. This assumes that oceanic flights will return to 2019 levels in 2025. The forecast is shown below, with further detail provided in [Appendix C](#).

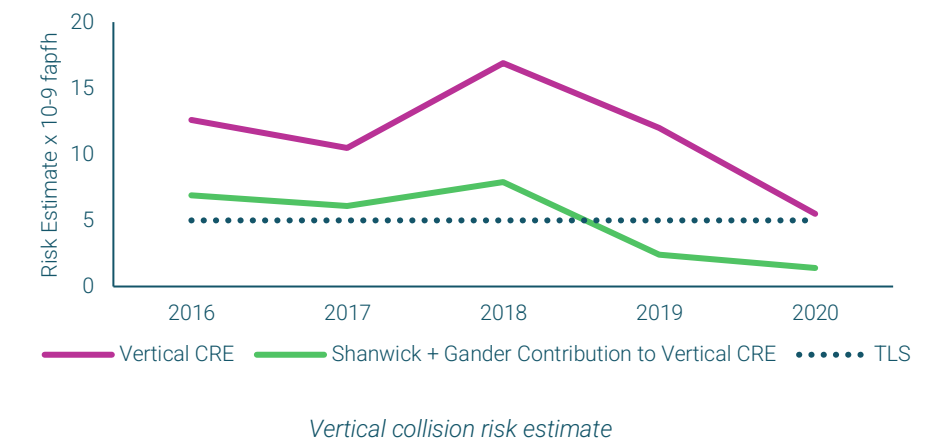


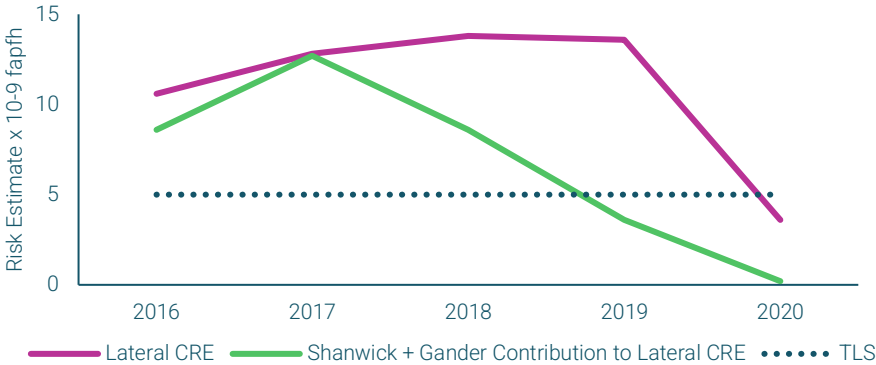
STATFOR Oct-21 derived traffic forecast

Service performance

ADS-B has reduced the vertical collision risk for the North Atlantic since its introduction in March 2019. This is evidenced by ICAO’s North Atlantic Mathematicians’ Working Group which calculated a 33% reduction between 2018 and 2019. As traffic returns, we expect further demonstrable safety improvements in the region as a result of ADS-B.

During NR23, we aim to meet the target level of safety which has been set by ICAO at 5×10^{-9} fatal accidents per flight hour year-on-year for both vertical and lateral metrics.





Lateral collision risk estimate

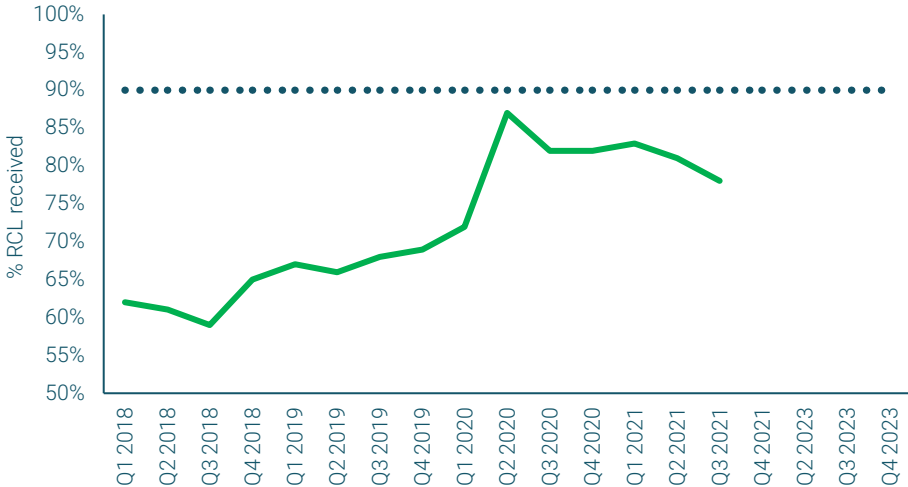
ADS-B has also delivered other service benefits. As shown below, 83% of flights were able to fly their preferred route in the first quarter of 2021, vs 72% for the same period in 2020 and 67% in 2019.

We propose an adjustment to the service performance measurement so that when an aircraft’s first requested trajectory is not available, we are measured on our ability to provide an operationally equivalent or better profile, in terms of fuel burn and/or time. We will build tools to assist our planning controllers with their flight profile selections and analyse the output to demonstrate customer benefits. We will engage airline customers on the definition of an operationally equivalent profile.

We anticipate the number of aircraft receiving their requested trajectory to continue to rise throughout NR23, supported by further planned optimisation of airspace planning capabilities and the provision of better quality, real-time performance data to our controllers. Our target over NR23 is to provide the requested clearance (or operationally equivalent profile) to 90% of suitably equipped flights within the oceanic airspace.

Achieving this target is dependent on all aircraft being authorised to use on-board performance-based communication and surveillance

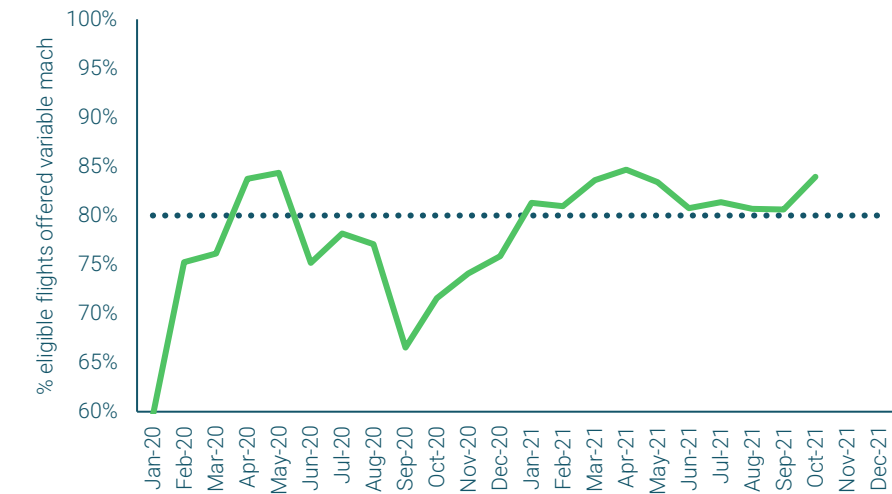
equipment, increased use of ADS-B enabled benefits, and establishing agreed operationally equivalent profiles.



Requested clearance vs clearance received 2018-2021

Since ADS-B provides controllers with real time surveillance of traffic, we have reduced the application of minimal horizontal separation between aircraft by over 80% and removed restrictions such as fixed speeds. The chart below shows the percentage of flights cleared for variable speed operations between August 2020 and July 2021. Over NR23, we will target 80% variable speed clearance for eligible flights, allowing each aircraft the flexibility to slow down or speed up to achieve maximum operational benefit.

Reducing horizontal separation provides the opportunity to issue more requested trajectories, as well as increasing flexibility and capability to support contingency situations such as ATC clearances to avoid weather. This reduces disruption for airlines and their passengers and also contributes to lower collision risk.



% eligible flights offered variable mach (2020-21)

Our proposed service performance metrics and targets are summarised below.

Metric	Target
Vertical collision risk	5 x 10 ⁻⁹ fapfh
Lateral collision risk	5 x 10 ⁻⁹ fapfh
% eligible flights offered requested clearance levels	> 90%
% eligible flights offered variable mach	> 80%

Summary of oceanic service performance targets

We will commission an independent review of the ADS-B based service, after defining metrics with the CAA and customers. We expect that the ADS-B review will be carried out within the NR23 period.

Capital investment

Our planned capital investment (£23m across NR23) is aligned with our operational partners, including NavCanada, and the ICAO Vision 2030 outcomes and benefits. We will continue to monitor opportunities,

through the oceanic gateway partnership, and will brief customers and the CAA appropriately

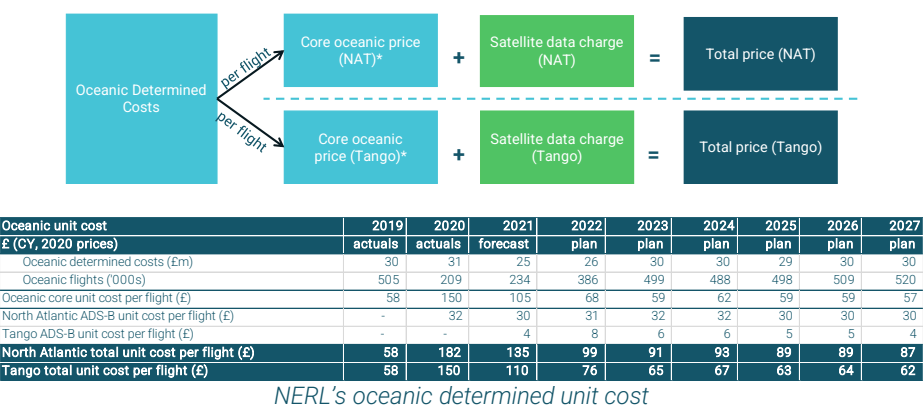
The initial focus of our programme is the removal of oceanic clearances, the introduction of new profile optimiser and workload management tools, the reduction in the organised track structure footprint and core oceanic system (GAATS+) elements. Further detail is provided in [Appendix H](#).

Costs and prices

The oceanic cost base is derived from the overall NERL cost base, as described in [Chapter 7](#). The oceanic determined costs are broadly similar to the 2019 average despite cost pressures in cash pensions, regulatory depreciation and regulatory return. Combined with slightly lower traffic forecasts, the average underlying NR23 oceanic core charge is around 3% higher vs 2019 at £59 per flight.

As in the RP3 plan, and shown below, there are two different charges which apply on a per flight basis: a charge for North Atlantic flights and a charge for ‘tango flights’ (flights in the south east corner of the oceanic airspace). In both cases, the charges comprise the core oceanic charge, plus an ADS-B data charge. For North Atlantic flights, the ADS-B data charge is a fixed per flight fee which we pass directly to customers at no additional margin. For tango flights, the ADS-B data charge is calculated by sharing the fixed cost of providing data in the ‘tango’ region across the annual forecast of flights there. The costs, data charges and resulting oceanic prices are presented below, and further information is available in [Appendix I](#).

the process to adjust the TRS mechanism and reset charges. The extraordinary circumstances caused by Covid-19, which have necessitated a reopening of the NERL plan and modification of the UKATS TRS mechanism, have affected all parts of our business and we are therefore assuming that the cost reconciliation will apply equally to the oceanic business. In addition, the CAA requests costs information on the entirety of our business and has stated that the reconciliation review applies to NERL as a whole. We estimate that the combined effect of resetting the price control for lower costs and traffic, and applying the TRS debtor process for oceanic would add around a further £13 - £15 pa on average to the underlying core oceanic charge in NR23, assuming that 75% of the oceanic TRS debtor is recovered in NR23, with the remaining 25% recovered in NR28.



In CAP 2291, the CAA asked us to set out our actual/forecast cost baseline for 2020-22, and explain differences to the CMA FD as part of

Regulatory mechanisms

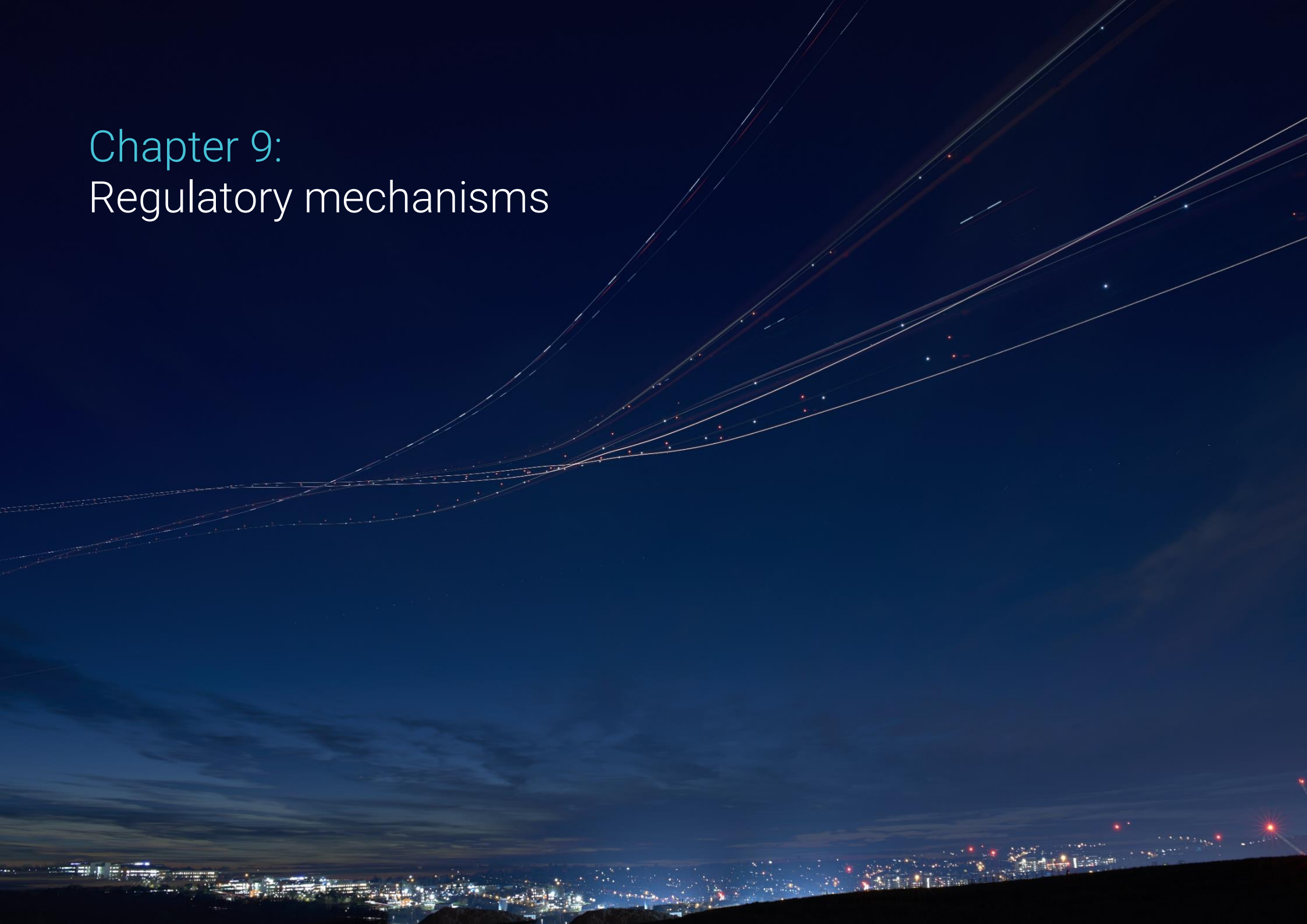
Unlike the en route service, no traffic risk sharing mechanism is currently in place for the oceanic service. For NR23, we propose a new traffic risk sharing mechanism for the oceanic core charge, which aligns with the en route service.

This would avoid windfall gains/losses for NERL/customers if traffic diverges from forecast, and supports proposals for en route to extend the timing of revenue recovery in the event of a further significant traffic shock.

Given the significant risks revealed since Covid-19, the absence of a TRS mechanism for the oceanic business would call into question the otherwise assumed use of the WACC estimated in the context of the UKATS business for the oceanic price control.

Our proposal aligns with the CAA’s business plan guidance that NERL should consider how uncertainty due to the impact of the Covid-19 pandemic should be mitigated and managed effectively in the interests of consumers. Further detail is available in [Appendix P](#).

Chapter 9: Regulatory mechanisms



Regulatory mechanisms

The regulatory model includes risk share mechanisms to support a financially stable ANSP with service quality for the benefit of customers. These enable us to plan and invest efficiently to deliver a safe, resilient service.

Most are fit for purpose, but were not expressly designed for the traffic variation seen in 2020/21. In response to guidance from the CAA¹⁹ to develop the regulatory framework for the uncertain traffic recovery, and the CAA’s subsequent business plan guidance, we have put forward some modifications for consideration by the CAA. Our proposals are described below, with further detail in [Appendix P](#).

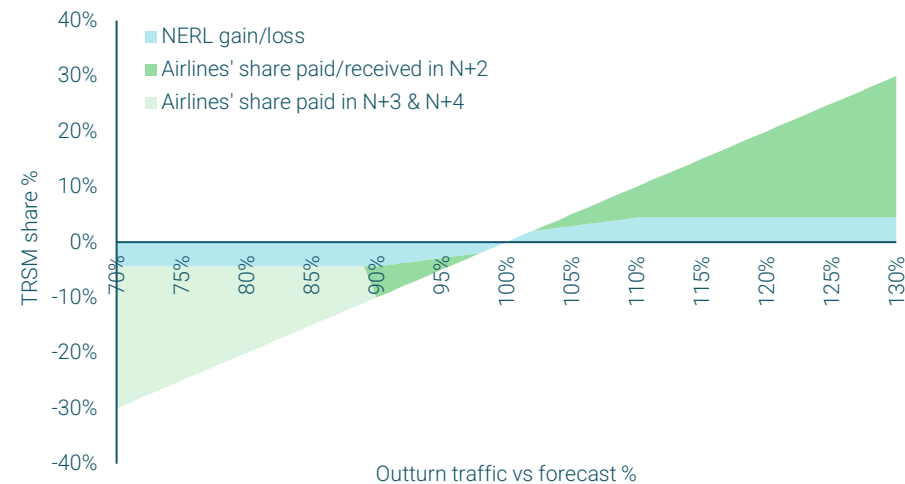
En route traffic risk sharing mechanism: recovery of 2020-22 TRS debtor

As described in [Chapter 7](#), we will support customers by extending the recovery of the TRS debtor over NR23 and NR28, on a 75%/25% basis, and smoothing prices in NR23. This is in addition to our immediate deferral of the 2020 debtor. Our plan assumes the TRS debtor is added to the RAB, earning the prevailing cost of capital. Given the extended period over which the shortfalls would be recovered, the amounts recovered would be adjusted for inflation, mirroring the current treatment of capital expenditure in our RAB.

En route traffic risk sharing mechanism: future variations

The importance of the traffic risk sharing mechanisms has been demonstrated clearly since the pandemic began; investors’ confidence in the mechanism enabled us to access current liquidity and long-term debt financing efficiently. To help customers in scenarios with

significant traffic downturns, we propose to extend the payment term where variations are in the range 10% to 30% below forecast and recover these revenues over 2 years in N+3 and N+4. Given current uncertainty, there is a chance that such a scenario may occur in the early years of NR23, and we have modelled this as part of our financeability assessment (see [Appendix N](#)).



Proposed traffic risk share mechanism

In the event that traffic varies by more than 30%, we would seek to agree with the CAA how to manage this. We propose to maintain the existing mechanism for scenarios where actual traffic is above forecast, so that airlines will continue to benefit from a reduction in charges in year N+2. Customers requested further detail on this proposal at the consultation, which is provided in [Appendix P](#).

¹⁹ CAA, Economic regulation of NATS (En Route) plc: consultation on approach to the next price controls review, CAP 1994, December 2020

Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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Oceanic traffic risk sharing mechanism

We propose a traffic risk sharing mechanism for the oceanic service. This would cover NERL's core charges (excluding ADS-B data charges). Our proposal would avoid windfall gains/losses for NERL/customers if outturn traffic diverges from forecast. The heightened uncertainty around future traffic levels means this mechanism is likely to be more important than when we proposed it for the RP3 review. It would align with the en route service which is important given that the NERL business is funded on a single platform and has a single cost of capital. Our proposal also responds to questions from the CMA during the 2019 reference on the RP3 plan as to why there was a different risk sharing treatment of the en route and oceanic businesses.

Airlines queried the benefit of this proposal. Our analysis indicates that oceanic traffic is more volatile than en route traffic, and customers would have benefitted in RP2 had a risk sharing mechanism been in place then²⁰. Further detail which is provided in [Appendix P](#).

Opex flexibility fund

We have removed the opex flexibility fund on the basis that the airspace modernisation activity it was designated to support is now included within the NR23 plan.

De-risking the defined benefit pension scheme

We propose formalising the inclusion of pension cash alternative costs in the pass-through mechanism that was established in RP2. This means customers would receive the net benefit of lower DB pension scheme costs in the event that employees opt out of the DB scheme. It also de-risks the future funding position of the scheme. Further detail is provided in [Appendix K](#) and [Appendix P](#).

Approach to integrating new airspace users

In line with the approach taken at RP3, we have made provision in our plan to ensure the continued safety of commercial aircraft as new airspace users such as drones increase. The funding included in our plan is similar to the RP3 determination.

However, the growth of new airspace users, in particular space flight and commercial drone operations, will place additional demand on NERL. We will need to design new procedures to manage airspace to integrate new airspace users into current systems. New users will have an adverse impact on service performance, and we therefore propose to revisit targets in NR23, when the implications are clearer (see [Appendix E](#) and [Appendix F](#)).

Early stage estimated costs for this work are £34m across NR23 (£30m capital investment, £5m operating costs), as shown below. However, we have not included this funding in our plan because airlines expressed a clear view in consultation that the 'user pays' principle should apply.

Since this work is nonetheless important to the ongoing safety of UK airspace, we have set out a proposed mechanism for recovering investment to support the integration of new airspace users, in [Appendix P](#). This requires support from the CAA to define the new charging mechanism for NR23, or to confirm an alternative way forward. Work to absorb new user growth will not be viable without a clear understanding on funding; if a new charging regime is not set up, in practice this will mean airline funding is required via the unit rates. However, this is neither NERL's nor airlines' preference.

²⁰ Prices 13% below actual in 2019, and on average 4% below actual across the whole of the RP2 period

Summary	Customer and passenger priorities	Traffic outlook	Performance outcomes and metrics	Service delivery	Capital investment	Determined costs and prices	Oceanic plan	Regulatory mechanisms
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Item	Description	Capex	Opex	Total
Initial uncrewed traffic mgt services	Automated tools to process the growing volume of airspace access requests in restricted areas or around airports, thus reducing demand for additional staff	1	2	3
Integration of UTM functions	Evolution of existing core infrastructure systems to enable integration of larger drones into controlled airspace (eg dynamic airspace reconfiguration)	4	0	4
Electronic conspicuity	Low-level ADS-B for targeted blocks of airspace to manage the growing safety risk from infringements and enable integration of un-crewed platforms	10	0	10
Digital flight information service	Automation and digitisation of existing Information Services that would support airspace integration in accordance with CAA Airspace Modernisation Strategy	6	0	6
Common information service provision	Provide a set of centralised real time information services to be made available to third parties. This would generate additional sources of revenue for NATS as well as facilitate a more competitive downstream market for drone services	1	2	3
Very high altitude airspace management	Adaptations to existing systems and airspace structure to accommodate new vehicles in controlled airspace between FL500 and FL600.	4	0	4
Space flight ACPs	Implementation of necessary system adaptations and changes to operational procedures to accommodate new spaceflight Airspace Change Proposals	3.5	0.4	3.9
Total		29.5	4.5	34

Estimated costs to integrate new users

encourage lower carbon flying in line with the Government's Jet Zero project, that could reduce both emissions and fuel burn.

This is a complicated and challenging area that will need careful study to understand the potential benefits and consequences. Options may include a charging scheme that incentivises lowest emissions routes or equipage in the charging basis. Airlines supported the proposal to explore practicable options to address sustainability, and therefore, we will look to establish a working group to progress ahead of NR28.

Exploring future charging mechanisms

In response to the urgent need to ensure aviation is sustainable into the future, we consulted on an option to work with our customers and the CAA on a feasibility study for a new charging mechanism. This would