Appendix G: Operational resourcing

Operational resourcing requirements are inseparable from our target service performance outcomes, described in Appendix E and Appendix F. Our resource plan aims to match the supply of controllers to reasonable projected demand levels to provide a safe operational service of the right level of performance, sustain the operation and support the investment programme. Resilience and flexibility are also key priorities for NR23 based on continued customer feedback and the findings of the CAA's Palamon investigation.

Demand planning

Operational demand

We have an established process to forecast the number of Air Traffic Controllers (ATCOs) that we require for a safe operation of the right service quality and resilience, for example, to cover staff sickness, technical issues, weather, and industrial action in other countries.

This process considers the number of airspace sectors that we expect to open and for how long, the number and validation (skills) mix of staff required to operate those sectors with the requisite service quality. This process is founded on the traffic forecast, historic traffic presentation and outturn performance. The composition of returning traffic volumes will be closely monitored to understand if and where there may be material differences following the pandemic that require a corresponding change to our resource plan to maintain targeted performance. The traffic forecast, although the primary driver of controller headcount requirement, is only one variable in the planning process.

Non-operational demand

In addition to their core role of air traffic management, controllers are required to undertake work that is necessary to ensure we maintain our operational service into the future. This includes competency assessments, professional training and development, supporting safety improvement work and the initial (rating) and operational training of new controllers.

We also require expert input from controllers as we develop and deploy new technology and airspace change. This ensures that we obtain high quality outcomes when we transition these projects into service. Naturally, controllers must train to operate new equipment, procedures and airspace before these enter into operation. This work is planned through our investment programme, and forms part of the overall controllers resourcing requirement.

Supply planning

Key points underlying our supply projections for NR23 are:

- **Operational demand:** Our estimate of the controller headcount required to provide the operational service, aligned to the STATFOR October 2021 base traffic forecast
- **Operational supply:** The controller headcount effort available to deliver the operational service. This includes a proportion of time (four shifts per month) from ATCOs who retain operational skills but whose main role is devoted to other tasks, for example, training or supporting airspace changes

- **Controller retirements:** We assume a retirement age range of 55-57 based around the five-year historical average of actual retirement ages (excluding medical retirements). This range translates to approximately 25-35% of current controllers (205-310 FTE) retiring by the end of NR23, with a further 230 expected in NR28

- **Other controller losses:** Other controller headcount losses (eg medical reasons or resignations) are based on a five-year historical rolling average of actuals or similar historical experience

- **Change in controller validations mix:** The loss of experienced staff with multiple validations leads to a reduction in operational flexibility until newly trained ATCOs acquire similar skill levels, which can take up to two years from initial validation. Other skills, such as instructors and competency assessors, also require a minimum level of experience before they can be replaced which is typically two years from first becoming valid in the operation

- **Trainee timelines:** The time for a trainee to validate from arrival on unit based on historic performance is up to 21 months at Swanwick and 14 months at Prestwick. The Swanwick operation is more complex than the Prestwick operation, accounting for the difference in validation time. Our supply plan for NR23 incorporates an improvement to the duration at Swanwick from our extensive training transformation programme (described in further detail below), reducing to 15 months

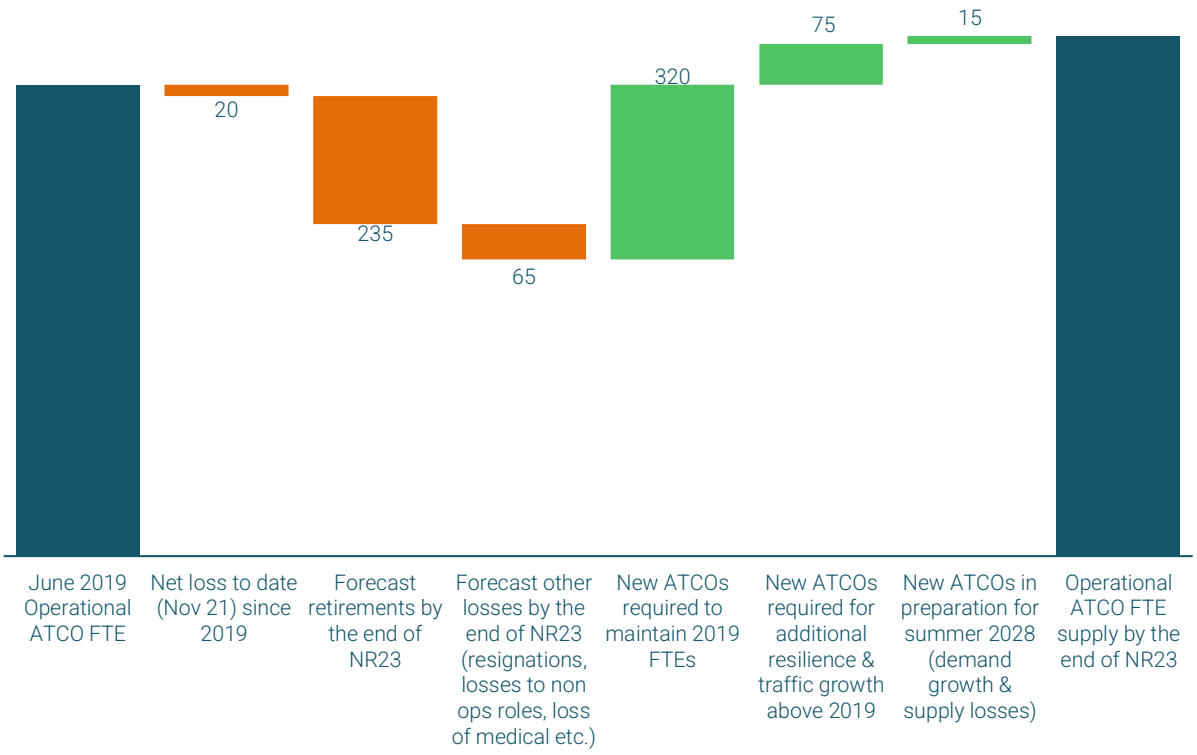
- **Trainee pass rate:** The assumed trainee pass rate based on historic performance is 75% at Swanwick and 100% at Prestwick. The difference in pass rates is related to the relative complexity of the operations; Swanwick area control and London terminal control are among the most complex volumes of airspace in Europe[1]. As explained above, our plan for NR23 incorporates improvement achieved through the training transformation programme, increasing the success rate at Swanwick to 85%

- **Training college assumptions:** Our plan maximises the use of available training capacity within NERL in both the training college and 'on unit' training in all years of NR23. This was supported by airlines at the customer consultation in autumn 2021. Running the college at maximum capacity is necessary to deliver the required supply in NR23 and beyond, especially following the enforced suspension of training activities during Covid-19 and given the expected volume of controller retirements in NR28, together with increasing traffic levels

- **Overtime assumptions:** A level of overtime is assumed as an efficient means to support non-operational activities such as the capital programme and training new controllers. The plan contains the equivalent of up to 15 FTEs worth of overtime pa, in line with the uptake achieved in 2019. The overtime will also be used tactically to mitigate temporary shortfalls in the operation, such as short notice sickness. However, we have not assumed a level of overtime within our long-term resource planning to deliver the operational service as a matter of course

The chart below illustrates how our core supply plan for NR23 bridges from the operational controller workforce in 2019 and its demonstratable outturn performance, to the requirement by the end 2027, embedding the necessary resilience and capacity to manage expected growth beyond 2019 record levels.

[1] ATM Cost-Effectiveness (ACE) 2016 Benchmarking Report: Annex 6 – Table 0.2

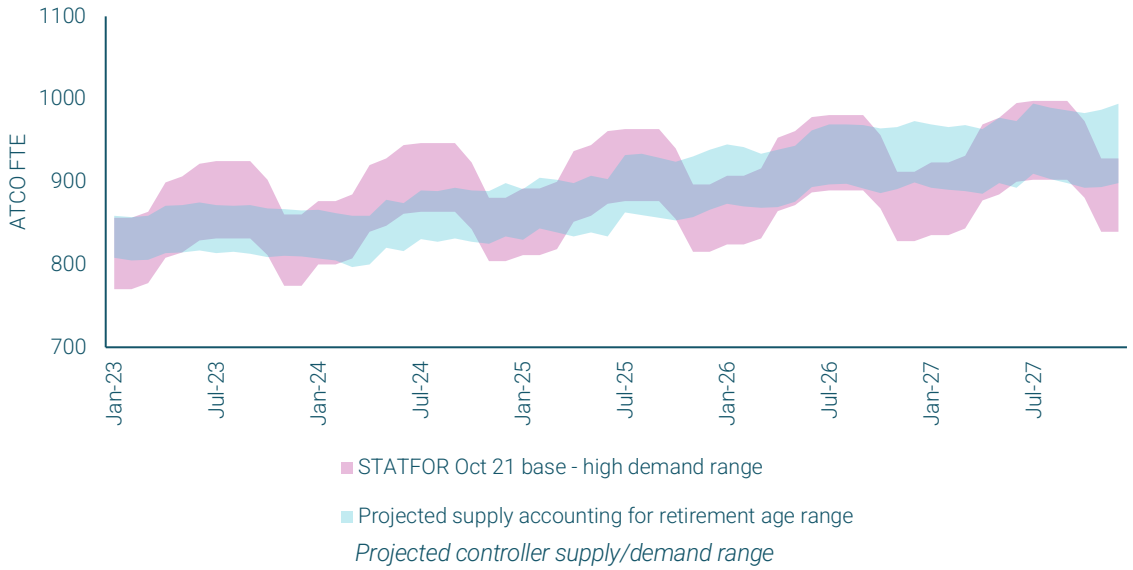


Change in controller supply by end of 2027 vs 2019

This plan meets the STATFOR October 2021 base traffic demand in all years of NR23. The STATFOR October 2021 high case traffic equates to a demand of at least an additional 80 controllers above the base in all years of NR23. Should demand accelerate to this level, increasing supply to this extent through training new controllers will not be possible; our plans already maximise available capacity to recover the lost progress from the enforced 13 month suspension of unit training activities and two year closure of the training college in response to Covid-19.

While we would take every measure to ensure we continue to provide an efficient service, managing high case traffic demand while continuing to commit the required resource to sustain the operation and support the investment programme, is very likely to lead to service quality being degraded. A modulation mechanism has been proposed to respond to this uncertainty in traffic volumes. Based on this, we estimate that should high case traffic materialise, the impact on the C2 capacity score would increase by around 5-7 seconds per flight. Further detail on the modulation mechanism is available in Appendix E, and further information on the resource options to respond to much higher or lower demand can also be found in Appendix Q.

The chart below demonstrates the uncertainty and range of possible outcomes in NR23, with STATFOR October 2021 base and high demand and supply factoring a retirement age range.



Projected controller supply/demand range

Our objective is to manage supply to the level required to achieve the target service performance. As forecasts evolve and certainty emerges both prior to and during NR23, our resource planning processes will identify adjustments to address shortfalls or surpluses against the optimum. We intend to continue to engage with customers through the Service and Investment Plan (SIP) process on the evolution of traffic and associated service implications.

Our core supply plan contains an efficient level of staffing, consistent with an appropriate level of operational resilience and service performance requirements, which balances the cost of additional controllers against the cost of delay, in terms of wasted fuel and the value of passengers' time. Eurocontrol economic analysis[2] suggests that every second of air traffic flow and capacity management delay, measured as average delay per flight in the UK, would add around £5m to airline costs[3], and up to a further £6m to passengers' costs[4] (based on value of time) in NR23. These are significant potential costs, and we recognise the importance of providing customers and their passengers with a level of service that minimises delay.

Training

In order to deliver the required supply of new controllers into the operation, we are prioritising a number of activities.

We will restart our initial training programme for controllers in February 2022, following a closure of two years, and progressively scale up capacity. This will enable us to run the training college as efficiently as possible, ensuring that the next cohort of trainees will arrive on unit as seats become available for on-the-job training, thereby minimising the risk of bottlenecks in the system.

122 trainees undertaking initial training left the business in November 2020 following the temporary closure of the training college. We maintained contact and provided the opportunity to recommence, and have been able to confirm the intention of around 90% to return – this minimises trainee recruitment costs and enables us to restart training as quickly as possible.

[2] Eurocontrol Standard Inputs for Economic Analyses, Edition 9.0
[3] Based on €100/minute (2014 prices) estimate of airline value of time, adjusted to 2021 using CPI and €1.17:£1. NR23 total calculated using STATFOR Oct 21 base forecast flights
[4] Based on £49.20/hour (2014 prices) high estimate of passenger value of time, adjusted to 2021 using CPI. NR23 total calculated using STATFOR Oct 21 base forecast flights

Training transformation programme

We are progressing the second phase of a training transformation programme to reduce the duration of unit training and increase success rates in both the training college and unit training. The transformation includes four interdependent streams of work:

- Unit training improvements including additional use of existing simulation capabilities and increasing the qualifications included in the first validation which reduces the need for extension training
- New basic, rating training and transition training content and delivery, restarting the initial controller training programme
- Instructor development across all phases of instruction
- Implementation of competency based training

As noted previously, the targeted performance improvements at Swanwick unit training have been factored into our supply plan.

As well as training new controllers to increase headcount, there is a dual focus on increasing skills through extension training to bolster skill mix and resilience. Support staff numbers are also being increased to give us the capacity to continue familiarisation training in our simulators when students are first posted to units, at the same time as demand increases for simulated conversion training aligned to our investment programme.

In combination, the planned improvements alongside reintroducing a large proportion of previous trainees to restart their progress, equate to an additional 65 controllers completing their training by the summer of 2024.

Investment in training and synthetic capability

Given the volume of new controllers required in NR23 and NR28, assuring the resourcing pipeline through effective, efficient and evolutionary training is critical. We also expect a similar number (around 230) of controllers to retire in NR28. This has driven our search for innovation. Therefore, we have included around £15m investment in training and synthetic capability to establish a training academy at our Swanwick centre to deliver initial and unit training.

Given the level of uncertainty about the shape of returning traffic and ongoing restrictions, this would reduce our dependency on the live environment to progress training by enabling remote, high fidelity, repeatable computer simulated training across multiple locations. It will consistently and predictably deliver training to a given volume and demand, providing greater agility for the business to respond and adapt our supply to material changes in demand.

The benefits of the investment are described below:

- Increased predictability and improved resilience: By using technology and synthetic environments, we will be able to increase the number and quality of trainees and remove the capacity limits (ie training seats available) and current environmental constraints (such as traffic levels, weather, time of year) in place on the initial training programme. For example, trainees who train in high traffic environments typically have a higher chance of validation, and take less time to validate, than those who train in lower traffic environments. Our investment will therefore enable us to deliver training more predictably

- **Remove holding:** The removal of training capacity limits across all phases of training will eradicate holding pools, enabling us to flex up and down more easily in the event of unforeseen changes in demand

- **Targeted training:** The investment will enable real world conditions and training objectives for each sector to be mapped to the synethic environment, meaning that we can validate new controllers at the point of need and increasing the agility of the business to respond to changes in traffic demand

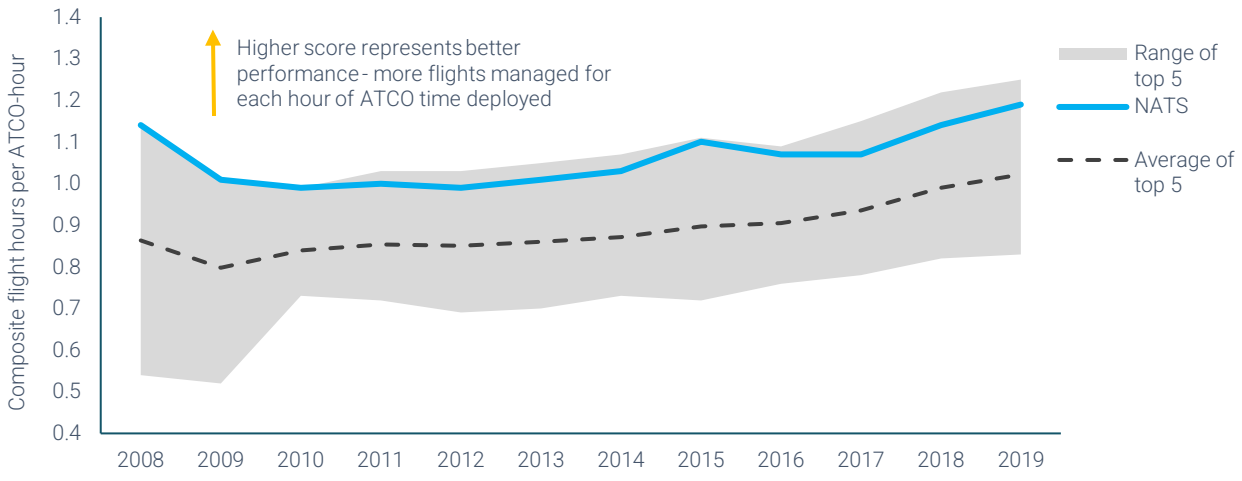
- **Reduce duration of unit and extension:** Using the synthetic training environment, and adapting learning styles to the individual trainee, we predict a reduction in the time taken to gain a validation. In particular, we anticipate a benefit for the London Approach sectors where training resource availability currently constrains our ability to deliver additional validations

- **Reduce duration of conversion training:** We predict a 50% reduction in the duration of conversion training (for the implementation of new technology), enabled by the removal of resource intensive face to face training programmes which will be replaced by training on digital platforms. This will increase the throughput of conversion training programmes (eg three simulation days could be consolidated in a single day of digital training) and will reduce reliance on controller resources to deliver training

- **Improve success rates:** The investment will target 100% success rate, enabled by our ability to target training for individuals across all required scenarios and conditions

Productivity and evidence of efficiency

Our controller productivity has been trending upwards in the decade since 2010, when traffic started to recover from the global financial crisis of 2008-10. This was broadly matched by productivity growth among the other 'big 5' ANSPs. Our performance has been consistently at or very close to the best in our comparator group, and among the best in Europe. In 2019, our performance was very close to best in group, just behind German ANSP (DFS) despite both ANSPs operating in more significantly more complex airspace than the other three large ANSPs.



Composite flight-hours pre ATCO-hour benchmarking

Our core supply plan for NR23 to meet STATFOR October 2021 base traffic demand is aligned to maintaining the flights per ATCO managed in 2019 and, as evidenced above, the benchmarked efficiency this represents.