ATC Staffing Resilience Plan

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Table of contents

1. Introduction

A safe and resilient air traffic control (ATC) service is delivered through a combination of capabilities, including people, systems, and processes.

Resilience in operational staffing relies on our ability to provide sufficient air traffic controllers (ATCOs) with the right sector validations to meet operational requirements.

This document outlines the current processes and procedures specific to operational staffing resilience. These aim to anticipate, prevent, absorb, or adapt to disruptive events that could impact staffing availability and recover from such events safely and rapidly.

1.1. Supply constraints

We operate in a safety-critical environment. We need to deploy our staff in ways that manage ATCO fatigue and the variable intensity and complexity of traffic. We have a high level of union membership within our workforce, and we work to have constructive relationships with our Trade Unions to ensure we have agreements that deliver the resource and resilience the business requires whilst complying with the various regulations for ATCO working hours. Constructive relationships aid our change management processes and allow for bespoke agreements when resource constraints are identified, for example, when new airspace or technology is introduced into service.

ATCOs are deployed in small teams within a watch-based structure. Each ATCO has skills for a small number of airspace sectors, which are limited due to regulatory recency requirements. As a result, a reduction in the number of ATCOs or their skills can significantly adversely impact the deployable resource for a particular part of the airspace network. In addition to having a disproportionate impact on service resilience, having too few ATCOs can affect our ability to implement changes to our service while minimising disruption to customers. Our ATCOs are also required to support non-operational activities, which are critical to ensuring we can continue to deliver the service in future reference periods. These include supporting the development of technology and airspace programmes, improving safety, developing new procedures, and complying with competency and training requirements.

Due to the demographic profile of our operational staff, we expect a substantial number will retire during the next five to ten years. There is no fixed retirement age for ATCOs and they can leave with relatively short notice. With long lead times to recruit and train, we must carefully manage the risk of staff shortages. Furthermore, losing more experienced staff with multiple validations reduces deployment flexibility until newly trained ATCOs acquire similar validations. This can take up to two years from the point new ATCOs gain their first sector validation.

1.2. Demand characteristics

Traffic growth and the operational demand it generates is not equally distributed across the network. Several sectors have seen double-digit annual percentage traffic growth at peak times. As sectors reach full capacity, we may be able to open additional sectors with a corresponding requirement for controllers. In some cases, however, increasing capacity requires airspace change. The relationship between traffic and delay is not linear. If insufficient ATCOs are available to service the operational demand, there is a risk that even small levels of traffic growth result in much greater increases in delay.

Long-term traffic forecasts contain inherent uncertainty. Airlines will respond quickly to changing passenger demand for different destinations by adding and/or changing their routes season by season. As an historical example, between 2017 and 2018, a proportion of traffic shifted from Spanish destinations to Greek, Italian and Turkish destinations. This increased the workload of airspace sectors covering the eastern part of the UK. The dynamic nature of this process means that airlines often do not know which destinations or routes they will operate for the following season, much less the longer term. Therefore, we aim to have a long-term plan and processes that enable us to respond to changes in our customers' needs.

At the other end of the time scale, traffic presentation each day is driven by various factors such as weather, capacity, European air traffic flow management regulations, airspace complexity, and sometimes industrial action elsewhere in the network. Many of these drivers are inherently unpredictable and/or out of NATS' control. We will always prioritise safety; should the two outcomes conflict, we will prioritise safety over service performance.

A further unusual factor in our business is the impact of the jet stream. Our unique position as the gateway to Europe from the North Atlantic means that changes in the jet stream significantly affect the way air traffic uses UK airspace and, in turn, the number of ATCOs and validations that we require. If the jet stream is in higher latitudes, the air traffic travelling east tends to follow the jet stream, resulting in heavy loads in many of our sectors in both Scottish and English airspace. If the jet stream is located more southerly, then much of the traffic either enters the airspace of our southern sectors or sectors controlled by neighbouring Air Navigation Service Providers (ANSPs). The jet stream's position is a significant determinant of our daily staffing requirement but is not predictable more than four days in advance. We need to plan operations for both scenarios.

1.3. Customer and regulatory considerations

The level of safety, service performance and operational resilience we provide is very important to airspace users. These priorities are evident in our annual customer survey and in the NR23 review consultations.

Industry feedback has demonstrated sensitivity to delay at London airports, even when we are operating well within performance targets across the network.

The CAA investigated our operational resourcing in 2016, under the provisions of the Transport Act 2000, following a formal complaint. This investigation was known as Project Oberon. Although the complaint was not upheld, we have acted on the Project Oberon report's recommendations and continue to improve our planning and delivery to provide a resilient service.

A further CAA investigation - Project Palamon - was initiated following complaints brought by Ryanair plc and Stansted Airport Ltd related to Air Traffic Flow Management delays experienced by airlines and passengers of Stansted and Luton airports between January 2019 and March 2020. NATS has accepted most of the CAA's recommendations and has developed a response that seeks to address the concerns identified by the investigation.

CAA recommendation 1 relates to staffing resilience available to London Approach airports and Essex airspace. Recognising the need to deliver a more flexible and agile operational capability in the future, as documented in NATS' main Palamon response submission and updates, NERL is developing a range of initiatives to support this outcome in consultation with staff and Trades Unions. Alongside these initiatives, there remains a continued focus on training to deliver both headcount and validations to bolster resilience and flexibility in this part of the operation. Our workforce forecasts for these Approach sectors are contained in Appendix 2.

2. Proactive and reactive resilience

NATS' resilience framework consists of two main components: proactive and reactive resilience barriers. Each considers a combination of people, technology, and process arrangements. Proactive resilience barriers aim to minimise the risk of disruption, reducing the likelihood of the event and/or its potential impact on the service. Reactive resilience seeks to minimise an event's impact when it occurs through incident response and recovery.

For the purposes of this document, proactive staffing resilience refers to the workforce planning and deconfliction activities undertaken before the day of operation to best match available supply to forecast demand. Reactive resilience refers to the mitigations during the operation to tactically respond to a shortfall in available operational resource. To enable continuous improvement, we undertake regular reviews and lesson-learning exercises. These ensure our processes remain effective, and where appropriate, we will reflect changes to these processes in this document.

Our staffing resilience risk is insufficient supply for the requisite demand, materially impacting our service performance and/or other commitments. The barriers in place to enable us to anticipate this occurring are the same across the NERL operation. Apart from specific local variations defined within Unit Working Practice Agreements, the barriers to prevent, absorb and adapt are also the same across the NERL operation. The key determinant of which barrier(s) can be effectively enacted is how far in advance the staffing risk is detectable and measurable. To increase headcount, for example - a sustained shortfall in supply against demand, quantified long enough in advance, may be appropriately mitigated by training new ATCOs. Increasing headcount, however, in response to sickness notified on the day of operation, relies on a different set of tactical interventions. The primary barriers applied by NERL in response to identified staffing resilience risks are outlined in Appendix 1.

2.1. Proactive resilience

The following sections outline the processes for determining demand and forecasting and managing the available supply to provide operational staffing resilience across NERL.

Our planning is split across three distinct time horizons: strategic, mid and near-term, and rostering. Each horizon has processes and tools tailored to the level of uncertainty and the interventions available, given the distance from the day of operation. Scenarios are tested at each stage to ensure a full range of likely outcomes, and the effectiveness of our barriers, should they materialise, are considered. An example scenario is different retirement ages being modelled for the ATCO workforce to understand the impact on supply.

Table 1:Summary of our operational staff planning across 3 distinct time horizons

	Strategic	Mid and near-term	Rostering
From the day of operation…	18+ months away	18 - 3 months away	3 months - 1 day away
Planning horizon objective	Assess high level balance of supply against demand; informing recruitment and training requirement	Assess deliverability of operational and project plans	Optimise deployment of resource
Supply modelling	Assumptions applied at a workforce level e.g. expected retirement age, % sickness etc.	Supply modelling refined to include projected shift patterns and annual leave where available	Individuals' daily availability to roster to specific activities
Demand modelling (Operational)	Current seasonal staffing models adjusted at macro level to reflect forecast traffic, expected project benefits etc.	Operational demand refined to include validations per day with known and anticipated changes to staffing models	Sector validations and shift coverage required per day
Demand modelling (non-operational)	High level project demand for the operational workforce	Project demand refined to include requirements per day	Duration and validations required to detach to each non-operational activity per day
Primary people planning tools	SAP *(NATS Enterprise Resource Planning platform)* | OMP *(Operational Manpower Planning; a SAP module)*	SAP | OMP	Quintiq (ATC operational staff rostering platform)
	Predictability		

Source: NATS' own elaboration

2.1.1. Operational demand planning

We have an established process for forecasting the number of ATCOs that we require for a safe operational service of the right quality and resilience, for example, to cover staff sickness, technical issues and disruption from weather. It considers strategic, mid- and near-term, and rostering timeframes, refining our understanding of the variables as we progress toward the day of operation.

This process considers the number of airspace sectors that we expect to open and for how long, the staff required to operate those sectors and the requisite service quality. The traffic forecast is only one variable in the planning process and is not the sole driver of ATCO headcount requirements. As outlined below, many other factors need to be considered. Our Operational Delivery and Planning and Resource teams use their expertise to model and predict how many airspace sectors we will need to open in the future and the corresponding number of ATCOs required to operate them.

The operational requirement is determined using the agreed-upon Working Practice (WP) model process. These models are created for WP Groups within our operations, such as Swanwick Area Control (AC) and Swanwick Terminal Control (TC) non-Heathrow Approach. The WP models use various inputs, including a position staffing schedule (PSS) that governs the opening hours of operational positions, rostering criteria, NATS and national resourcing regulations, and operational expertise.

The PSS is determined following joint assessments of both service demand and effective capacity to meet that demand, incorporating service commitments made by NATS to its customers. The PSS uses:

- Historical information - total workload, sector opening times taken from Operational Position Monitoring (OPM) records
- Variations in traffic patterns - hourly, daily, weekly and monthly
- Predicted traffic - customer demand and requirements
- Business requirements - including our regulatory regime, delay targets and contractual commitments.

We then create a roster pattern and shift palette to match the PSS efficiently. This iterative process can produce changes to the roster patterns, the PSS, or both, resulting in an agreed-upon WP model.

Strategic time horizon (18 months + from the day of operation)

Given the degree of uncertainty this far before the day of operation, we forecast operational demand at the level of Full Time Equivalent (FTE) ATCOs required per month for each WP group. This requirement is determined by reviewing the current agreed WP model and extrapolating the impacts of variable macro factors across the strategic period. These include:

- The potential impacts of traffic growth, e.g. where sectors are likely to require more regular splitting as traffic grows
- Possible changes in aircraft routing, e.g. resulting from geo-political change, airport and airline growth plans (where known)
- Operating benefits from project delivery
- Benefit from continuous improvement in the operation
- Consideration of the expected target level of service performance

Mid and near-term time horizon (3-18 months from the day of operation)

We review the WP Group models at least every 6 months, considering:

- The timing, duration and frequency of airspace sectors used during the previous season and the delay that resulted
- Known and anticipated changes in flight volumes and routings
- Shift patterns, break allowances, leave allowance, and any updates to NATS and national resourcing regulations

Rostering time horizon

As discussed above, the WP model output is the number of shifts and activities required to meet the operational demand for a period. This demand is then reflected in Quintiq (the NATS rostering tool for operational ATC staff) and attached to a roster as the baseline demand against which to assign supply. As we approach the day of operation, we have additional intelligence available to refine the sector capacity required to deliver a safe, efficient, and resilient operational service. For example, the Eurocontrol Demand Data Repository (DDR), which we assess 5 days ahead of the day of operation, gives us a more granular view of anticipated traffic demand, and plans will be adjusted accordingly. We also build in trend analysis of traffic flows, sector openings and the outturn performance delivered from equivalent days of operation.

2.1.2. Non-operational demand planning

Alongside the requirement for ATCOs to provide the core operational service, we also need to ensure that our service is sustainable over the medium term. Therefore, we need ATCOs to undertake work necessary to maintain the operation. These include tasks such as competency assessments, professional training and development such as annual refresher training, supporting safety improvement work and the operational training of new ATCOs.

While we work to minimise ATCO involvement in projects to ensure their availability for the operation, we nevertheless require their input in developing technology and airspace. This involvement ensures high-quality outcomes from these projects and an accepted transition into service. In addition to input during the development phases, ATCOs must also undertake training to operate new equipment, procedures, and airspace before these enter into operation. This work is defined and planned through our investment programme and forms part of the overall requirement for the number of ATCOs we need to sustain the business over time.

Strategic time horizon

Non-operational activity owners (such as Projects and Training) levy demand for ATCOs in SAP in the strategic time horizon. As with operational demand, this far ahead of the day of operation, non-operational demand is estimated as the FTE required per month for each WP group.

Mid and near-term time horizon

As the timing and specific requirements for activities become more certain, SAP demand is refined iteratively toward the specific sector validations required each day. As we approach the near-term time horizon, activity owners must reflect demand as detachment requests for ATCOs through the Quintiq system.

Rostering time horizon

The detachment requests in Quintiq provide the granular details required to roster the activity, e.g., whether an ATCO holding a specific validation or general rating is needed or whether the timing is fixed or flexible within a date range. The Workforce Planning and Deployment team ensure the release is as efficient as practicable, weighing up each priority alongside other non-operational activities and operational service delivery.

2.1.3. Supply planning and balancing against demand

Our headcount supply plan aims to match the supply of ATCOs to the demands placed upon them to provide the operational service, sustain the operation, and support the investment programme.

In doing so, we aim to strike a good balance between having too many ATCOs, which would lead to higher prices, and too few, which could cause high indirect costs to our airline customers and their passengers through ATC delay as well as deferring the benefits that will be delivered by the

airspace and technology programmes. By having a margin for resilience, we aim to balance these risks.

Strategic time horizon

As with our modelling of demand in the strategic time horizon, we consider ATCO supply at the level of FTE per month for each WP group. Our supply is forecast by applying assumptions to the existing workforce, such as expected retirement age(s), non-retirement leavers (based on historical trends), and the proportion of time contributed by ATCOs who retain operational skills but whose primary role is devoted to other tasks such as training or supporting airspace design.

Given the lead time to train new controllers, the nearer portion of the strategic time horizon will contain trainees already progressing towards their initial validations, at which point they are counted as part of the ATCO supply. Where an individual's training has progressed sufficiently that a specific estimate of their validation timing can be made, this is incorporated in our supply models. For later years, data-driven assumptions are used to determine the timing and volume of trainees validating as ATCOs for each WP group.

Our ATCO training programme is ongoing, and determining our requirement for new controllers is iterative. When we assess our modelled supply against expected demand, this may indicate a shortfall. We evaluate shortfalls to determine their likely impact and manageability. If a forecast shortfall persists and the lead time is sufficient, demand will be levied on Operations Training to increase supply by recruiting and training new ATCOs. Given the unpredictable nature of workforce attrition, the supply balance between WP groups can fluctuate. Again, with sufficient lead time and training capacity, it is possible to offset emerging imbalances by reallocating planned future supply between WP groups.

Mid and near-term time horizon

As outlined, in the mid and near-term, demand becomes more certain and refined, moving from FTEs per month per WP group to the specific sector validations required each day. Our supply forecast is refined too, and high-level assumptions are replaced with objective intelligence, such as notice given by retiring individuals, confirmed parental leave and lost medicals.

The above events are uncontrollable and contribute to the fluid balance of validations across watches. This requires ongoing management and must be factored in alongside flexible working requests, career progression, and development moves by ATCOs to roles outside the operation.

Initial training for new controllers gains them a student licence for a rating: Area or Approach. As supply gaps in specific validations become known, trainee controllers are funnelled to units and watches to target them. Training for existing ATCOs to extend and gain additional validations is also targeted to increase flexibility and resilience to meet demand.

ATCO leave for the following season is finalised in this horizon, providing increased certainty on the likely availability of specific validations on specific dates.

Rostering time horizon

We begin building rosters approximately three months ahead in monthly blocks, and they are published on the 20th of the preceding month. Supply at the start of roster build is more stable than in preceding planning phases. We are however always susceptible to unplanned personnel changes and work to incorporate these into the roster with as little impact as possible as and when they become known. These changes could include individuals becoming unavailable through loss of licence and sickness (short or long-term).

As noted, a number of controllers whose role is primarily outside of the operation retain an operational validation. To maintain recency, they are required to complete a minimum number of operational shifts per month. These shifts provide additional resilience and flexibility to meet demand.

Rosters are monitored daily following publication. This monitoring involves looking at the headcount and skills mix available on the day, taking any tactical changes to demand or supply into account, e.g., adverse weather impacts or sickness. Where we identify imbalances which require resolution, we apply mitigations in line with the primary barriers outlined in Appendix 1.

2.2. Reactive resilience

If short-term (e.g., single-shift) or sector-specific staff shortfalls occur on the day of operation, such as late-notice sickness, redress is achieved through a range of mitigations initiated by the operations supervisor following the Working Practice Agreements and local arrangements (see Appendix 1).

For events spanning multiple shifts or where widespread staff shortfalls occur or are anticipated, such as severe weather, we invoke the response plans and incident management (details of which are contained within the NERL Core Services Response Plan). Silver Team will coordinate the response following Incident Management procedures.

3. Appendices

3.1. Appendix 1 - Primary barriers for identified staffing resilience risks

Table 2: Primary barriers for staffing resilience

Proactive resilience barriers: Strategic time horizon	› Train new ATCOs › Redistribute future planned trainees across WP groups › Identify requirement for enhanced overtime provision › Restructure non-operational demand (e.g. re-plan project activities)
Mid and near-term	<u>Supply</u> › Watch balancing › Periods of restricted leave › Overtime agreements › Extension training › Review part-time and flexi agreements › Review secondments and supply back to the ops room <u>Ops demand</u> › Identify high priority days for airport and airline customers <u>Non-ops demand</u> › Restructure demand › Reprofile and deconflict activities
Rostering	› Target resource from the non-ops controller maintaining recency where individuals hold a valid skill › Cancel/reschedule non-essential detachments or courses › Request shift swaps to reduce surplus on one shift to support shortfalls on another › Offer overtime › Apply additional attendance and flexibility options within NATS Agreement 123 (Prospect ATCO Resourcing Agreement)
Reactive resilience barriers	› Obtain resource from the non-ops controllers where individuals hold a valid skill › Recall staff from non-essential detachments, or courses › Request shift swaps to reduce surplus on one shift to support shortfall › Close less essential positions and redistribute staff › Temporarily stop extension training to make available the instructor and valid controller training on a new sector › Offer overtime › Apply network regulations

3.2. Appendix 2 - Demand and supply modelling for Swanwick Terminal Control - Heathrow and non-Heathrow Approach functions and Terminal Manoeuvring Area (TMA)

Our objective is to manage supply to the level required to achieve the target service performance. As forecasts evolve, 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 SIP process on the evolution of traffic and associated service implications.

Section 2.1.1 details our processes for forecasting operational demand. Section 2.1.3 shares how we model supply and balance against demand(s). Since the last update to this NERL ATC Staffing Resilience Plan in January 2024, we have evolved our method for estimating the operational requirement for ATCOs. This evolution came as part of ongoing continuous improvement of our demand forecasting. The previous method took a baseline supply and traffic demand (most recently summer 2019). It calculated the future demand for ATCOs in direct proportion to traffic growth, i.e. a 3% growth in traffic from the baseline creates a corresponding 3% increase in demand for ATCO supply, compared to the baseline. Demand growth estimates were capped in areas of the operation where subject matter expertise determined this was not realistic or required.

The new method aims to be more robust by factoring in our evolving intelligence on how traffic growth in our network translates to a demand requirement for ATCOs. We use delay modelling, targeted to deliver minimal staffing delay for forecast traffic, to determine the required sector opening scheme in future years. This modelling targets only elemental delay from constrained airspace, though short notice absence in critical skill areas can still cause staffing delays. The sector opening schemes form the basis for modelling the ATCO demand requirement, which still includes capacity to deliver other key operational activities and a level of resilience for short-notice absence.

We have included below outputs using the previous and current methods to demonstrate the effect on forecast demand. This results in some WP groups in a material reduction in demand (for example, in Swanwick TC Heathrow Approach, an 6% lower demand forecast for the remainder of NR23 between former and current methods). In other WP groups, such as Swanwick TC non-Heathrow Approach, an 8% higher demand is forecast for summer 2026 between former and current methods.

Demand

The charts below are based on the STATFOR March 2024 base traffic forecast with adjustments for business intelligence. Full modelling will be completed for the forthcoming NR28 consultation with the most relevant forecast at the time. A full update cycle has therefore not been undertaken with NATS internal November 24 forecast as it would shortly be superseded.

Supply

The charts below contain the forecast controller headcount available for operational service delivery. This headcount includes a proportion of time (four shifts per month) from ATCOs who retain operational skills but whose primary role is devoted to other tasks, for example, training or supporting airspace changes. It does not include an estimate for additional supply provided through overtime.

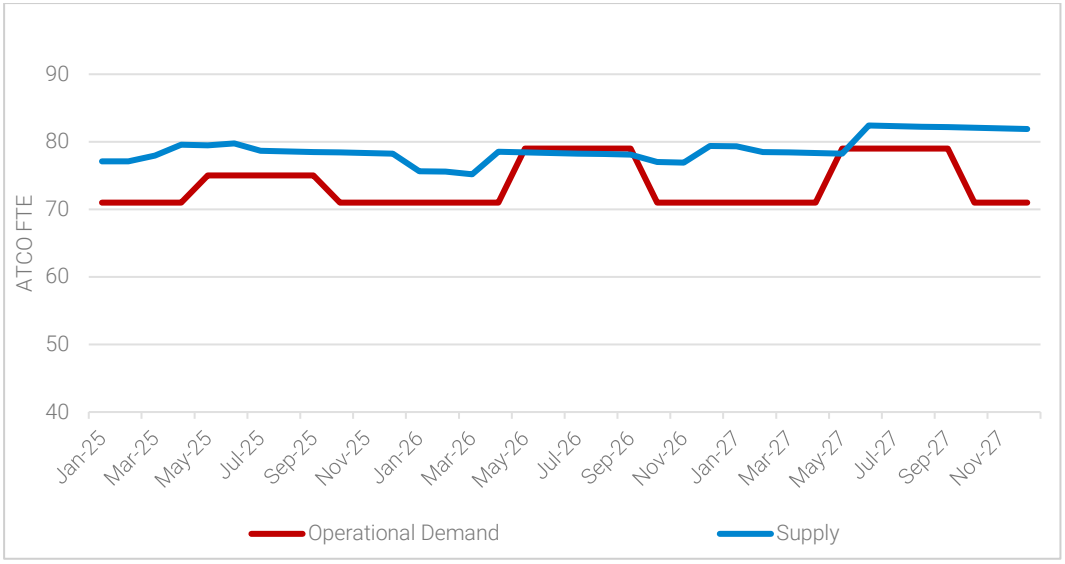
Supervisory demand and supply

We capture demand for supervisors within the TMA model. However, ATCOs that hold both radar and supervisor skills could be deployed against either an Approach or a TMA demand; therefore, they have been balanced in the graphs shown.

Flexibility and Resilience

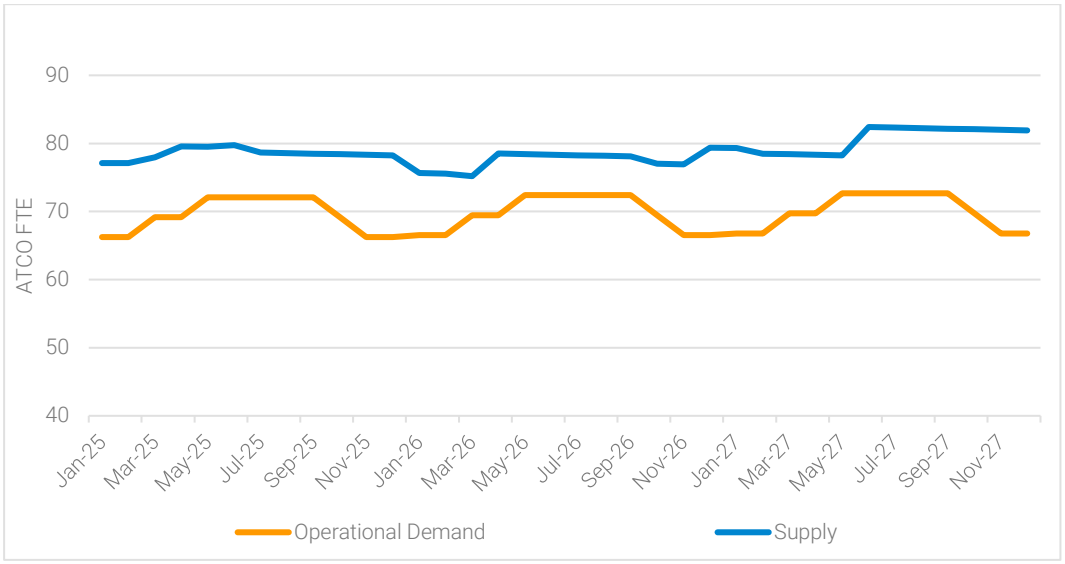
We build the Swanwick TC WP models taking account of the flexibility provided by ATCOs that hold validations across multiple sectors. Each operational unit sets a minimum unit requirement (MUR) for the validations controllers must hold. In TC, a Heathrow validation is MUR and has its own model. For the non-Heathrow Approach functions, two of these sectors represent MUR. ATCOs holding multiple sector validations allow us to distribute resource between them where required. This allows us to combine the non-Heathrow Approach functions into a single WP model, generating a more efficient total requirement than disaggregating the sectors. Although controllers are grouped separately for workforce modelling purposes, a selection hold both TMA and Approach validations. In conjunction with overtime which as noted, is not included in the supply forecast in these charts, this provides sufficient flexibility and resilience against potential imbalances suggested by the modelling in TC.

Figure 1: Swanwick TC Non-Heathrow Approach | Gatwick, Stansted, Luton, Thames | current method – supply derived from the sector opening scheme to minimise staffing delay



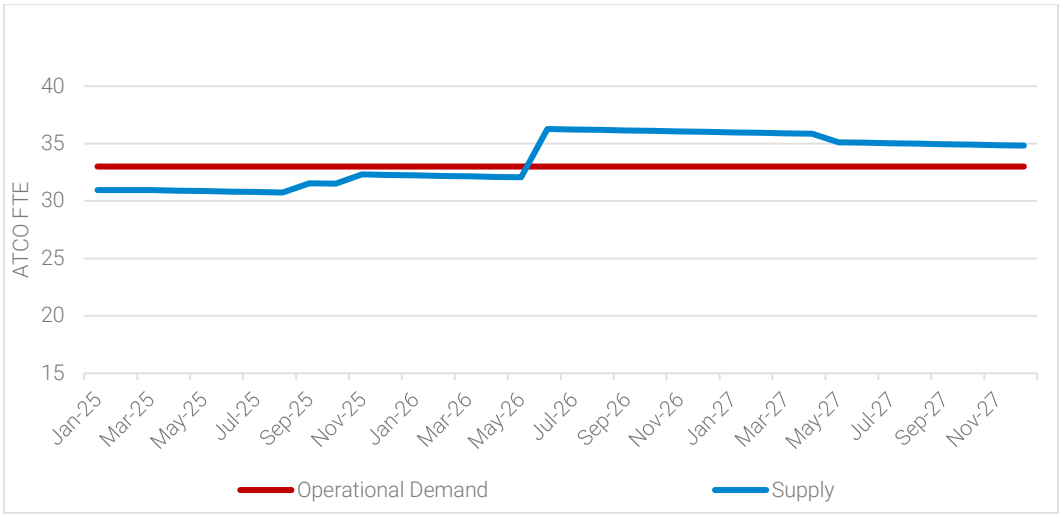
Source: NATS own elaboration

Figure 2: Swanwick TC Non-Heathrow Approach | Gatwick, Stansted, Luton, Thames | previous method – supply in direct proportion of traffic growth



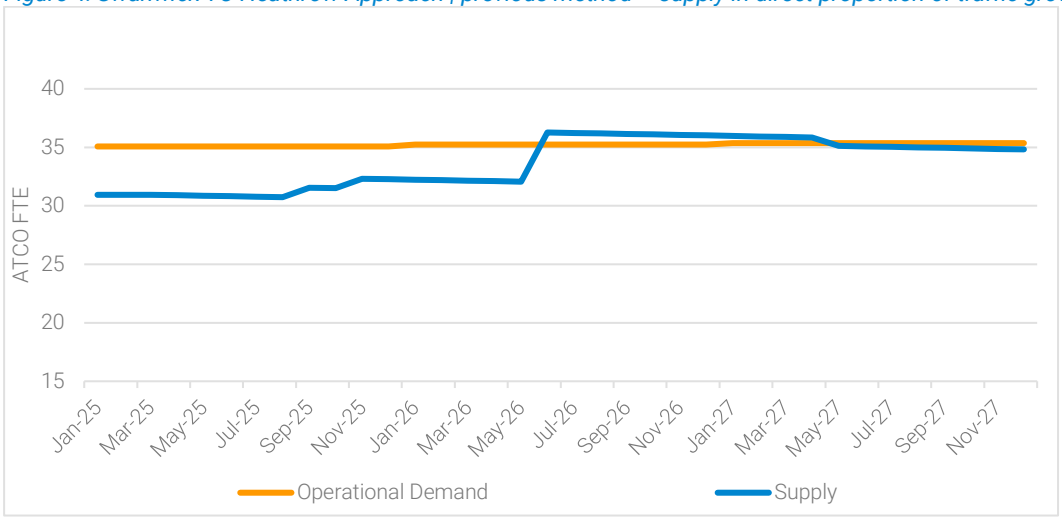
Source: NATS own elaboration

Figure 3: Swanwick TC Heathrow Approach | current method – supply derived from the sector opening scheme to minimise staffing delay



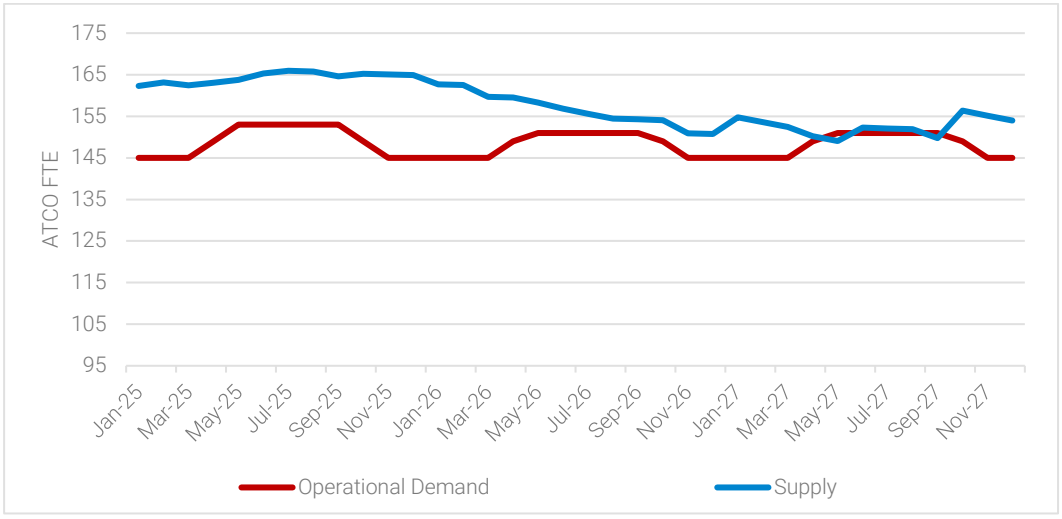
Source: NATS own elaboration

Figure 4: Swanwick TC Heathrow Approach | previous method – supply in direct proportion of traffic growth



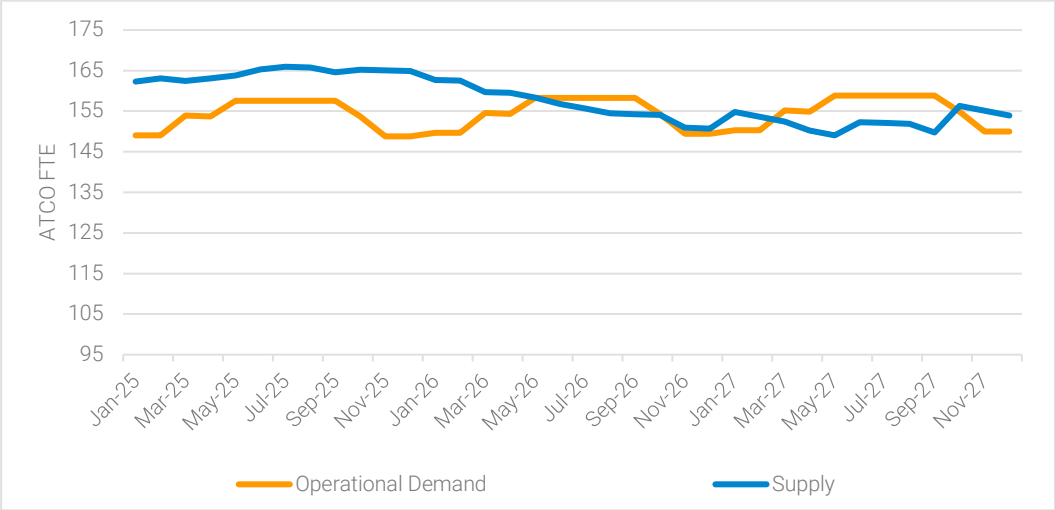
Source: NATS own elaboration

Figure 5: Swanwick TC Terminal Manoeuvring Area (TMA) | current method – supply derived from the sector opening scheme to minimise staffing delay



Source: NATS own elaboration

Figure 6: Swanwick TC Terminal Manoeuvring Area (TMA) | previous method – supply in direct proportion of traffic growth



Source: NATS own elaboration