

No 1778 – Service Order 16: UK TANS Charge Benchmarking
Consultancy Services for CAA's Regulatory Policy Group
9th December 2013



Quality Management

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Glossary

Term	Definition
(S)AMOS	(Semi) Automated Meteorological Observation System
APP	Allocation of Approach Costs
ASMGCS / MLAT	ASMGCS = Advanced Surface Movement Guidance & Control System / MLAT = Multilateration System
ATM	Air Transport Movement
CAA	The Civil Aviation Authority
CAPEX	Capital Expenditure
CTB	Control Tower Building
DME	Distance Measurement Equipment
DRS	Data Recorder System
DUC	Determined Unit Cost
EDI/Edinburgh	Edinburgh Airport
EFPS	Electronic Flight Progress Strips
EU	European Union
FDMS	Flight Data Management System
FTE	Full Time Equivalent
GLA/Glasgow	Glasgow Airport
HR	Human Resources
IFR	Instrument Flight Rules air transport movements
ILS	Instrument Landing System
IRVR	Instrumented Runway Visual Range
KPI	Key Performance Indicator
LAMP	London Airspace Management Programme
LGW/Gatwick	London Gatwick Airport
LHR/Heathrow	London Heathrow Airport
LTN/Luton	London Luton Airport
MAN/Manchester	Manchester Airport

MLS	Microwave Landing System
MoD	Ministry of Defence
NDB	Non Directional Beacon
NERL	NATS (En Route) Limited
NSL	NATS (Services) Ltd
OPEX	Operational Expenditure
PI	Performance Indicator
PSR	Primary Surveillance Radar
RDP	Radar Data Processing
RP2	Reporting Reference Period 2 2015-2019
RPI	Retail Price Index
SMR	Surface Movement Radar
SSR	Secondary Surveillance Radar
STN/Stansted	London Stansted Airport
SWDS	Surface Wind & Display System
TANS	Terminal Air Navigation Services (for RP2 in this review)
TCZ	Terminal Control Zone
TSU	Terminal Service Unit (Eurocontrol metric)
UHF TX/RX	UHF Transmitter & Receiver
VCCS	Voice Control & Communication System
VDF	VHF Direction Finder
VHF TX/RX	VHF Transmitter & Receiver
WAM	Wide Area Multilateration

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Executive Summary

The CAA commissioned Capita in October 2013 to advise on the cost efficiency of the UK's terminal air navigation services (TANS) through benchmarking the charges levied by the provider through contracts at seven airports (TANS provided at each by NSL), with other UK towers and with comparable European services. The study is to assist the CAA in addressing the EU Commission's wish to implement regulation (EU) No. 390/2013 of 3rd May 2013 which addresses TANS and network functions for airports with greater than 70,000 IFR annual movements. As part of this study, there have been consultation meetings with NSL and the CAA. In addition there have been visits to all seven airports covered by the study.

The quality and availability of the data used to inform this benchmarking analysis, especially relating to the sample of European airports, is mixed with some evidence that there are varying approaches to both IFR charges and provider's costs items across Europe. The review is also based primarily on the forecast charges provided for a single year which may not prove representative of the complete RP2 period. Capita has taken the information at face value and, with its applied indicative adjustments, has assumed the resultant charges per IFR movement are comparable and any weight placed on the conclusions herein should therefore take these limitations into account.

NSL has provided commercial details of costs, service levels and resourcing at each airport. The total forecast charge for the TANS function across the seven airports for the five year period 2015 -2019 is circa £664m at 2015 forecast prices. All airports require a 24 hour TANS function. The specifics of the commercial arrangements vary from airport to airport including the treatment of assets and property. The arrangements for control of airspace in the UK (NSL providing the TANS & NERL providing en-route service) differ from some other European providers. Of particular interest in this review is the added complexity of the separate London Approach and Capita has estimated and applied an indicative adjustment for each London airport to achieve improved comparability. In addition Capita has also applied an indicative adjustment to normalise for different asset and property treatments.

The TANS contract charge levied on, and paid by, airports is driven by a number of factors, including the scope of service and contractual arrangements, the nature and layout of the airfield, the complexity of operation, the scheduling intensity of the airport, the resilience required by the airport operator, shift and working patterns, asset provision and maintenance arrangements.

For the purposes of benchmarking, Capita has converted the contract price into a charge per IFR. This does not reflect the basis on which airports pay for TANS, but has been done to aid benchmarking.

✂

It is apparent that the TANS charge is sensitive to demand with significant charge variations across the benchmark sample reflecting the challenge in accurate benchmarking especially in Europe where approach varies and information is limited. As all airports require a 24 hour service with only limited multi-functional resourcing the economy of scale is evident although often tempered by airport complexity.

✂

The UK airports are generally characterised by the provision of TANS by NSL as the principal provider of such services on broadly similar contract terms.

✂

All bar Heathrow have seen reduced demand post 2007 but most airports have sought to maintain service standards and available capacity despite the downturn in traffic. The lower utilisation at these airports (especially Stansted and Glasgow) has had a pronounced impact on the charge per IFR movement given the need to resource to match particular peaks within each shift. With increased demand potentially towards the end of RP2 charge efficiency (measured as charge/IFR) will improve.

✂

Other UK airports on service driven contracts have TANS charges per IFR movement generally reflecting their reduced demand and whilst capable of responding to increases in the same these are not likely to improve until well into the RP2 period.

✂

The increasing liberalisation of the UK TANS market will potentially see charges further challenged with provider's costs coming under increasing pressure.

1. Introduction

1.1 Terms of Reference

The CAA commissioned Capita in October 2013 to advise on the level of charges for the UK's terminal air navigation services (TANS and otherwise known as tower services) through benchmarking charges between its airport contracts, other UK towers and with comparable European services. The TANS function at all the selected UK airports is provided by NATS Services Ltd (NSL). It excludes forecasts for Birmingham Airport, which would otherwise be included in the review, as NSL will cease to be the TANS provider when its contract expires in 2015 and consequently no charge forecast is available from that point in time.

The advice offered within this review will be used primarily within the context of the EU regulations. This is the first time that this benchmarking has been undertaken for the CAA. The study, by its nature, will be a relatively high level review of the service charges given the differing nature of the service, complexity in specific airport requirements and limited data available in respect of EU comparable airports.

NSL is the unlicensed business of NATS Holdings Limited (NATS). NATS also holds the UK Licence for the associated 'En Route' airspace through its regulated arm NATS (En-Route) Plc (NERL). The core business of NSL is the provision of air traffic control (ATC) services at 15 UK airports (of which seven are covered by this study) plus Gibraltar, under contract to the airport operator. While these airports are not subject to formal regulation under domestic legislation those with more than 70,000 IFRs will be subject, in aggregate, to a five-year cost efficiency target under EU legislation; for which this study is intended to provide input.

In February 2013, at the request of the Department for Transport (DfT), the CAA published a report (CAP 1004) reviewing the presence of market conditions in the provision of UK Terminal Air Navigation Services pursuant to Annex I of the Charging Regulation (EU 391/2013). As a result of that study the CAA is currently considering the implementation of the regulation to the towers identified in the report for the period 2015-2019.

More specifically, on the basis of evidence derived from considering the specific issues, the review is to provide:

- Advice on the cost efficiency of NSL towers with over 70,000 IFRs per year.
- Benchmarking between the NSL towers (Heathrow, Gatwick, Manchester, Stansted, Luton, Edinburgh and Glasgow). Birmingham airport has been excluded from this review.
- A review with the scope covering full tower services for all ATC Tower functions including approach, visual control for take-off and landing as well as ground movement control. As the London Approach service is provided by NERL at Swanwick, an estimate of the revenue that NERL will receive from charges levied on airlines has been added in for the London Airports.
- Benchmarking against other tower services within the UK and Ireland;
- Benchmarking against a set of European tower operations.
- A view on the appropriate allowance for input price inflation.

1.2 Approach and Methodology

In undertaking this review the approach adopted may be briefly summarised as follows:

- A review of the current and historical documentation and published Performance Review Reports (refer to 1.3 below). These reports have been supplemented by various documents provided by NSL and the CAA. It should be noted that many of these documents are confidential in nature and should not be disclosed without the prior permission of the CAA and NSL
- Meetings with NSL and the CAA to understand the overall context

- Additional meetings with NSL and visits to individual towers at the seven airports. Such meetings being necessary as it was recognised that there would not be a published report from NSL covering the varying requirements and charges applicable to each of its TANS contracts. Information was therefore expected to be limited to overall costs given the programme available and the particular data requirements of the reviewer. NSL has provided both charging and cost details to support the review in addition to operational information at each meeting. This has been utilised in this review, although by necessity, reasonable assumptions have been made to support this review where precise information was not available or obtained in the limited time for the review.
- Interim reviews with the CAA.
- Benchmarking of data and comparison reviews.
- Consideration to inflation and risk allowances.

1.3 Source Documentation and Meetings

This report draws on the following existing and on-going studies and reports:

- 2010 – Maastricht Upper Area Control Centre Annual report 2010, Eurocontrol
- 2010, NATS (En Route) PLC , Regulatory Accounts 2012/13
- 2011, AIRSPACE Quarter 1, Global Performance report, CANSO results highlight wide variations in ANSP performance
- 2011, ICAO, COG Performance Task Force Workshop
- 2011 – ATM Cost – Effectiveness (ACE), Benchmarking Report with 2012 -2016 outlook, Performance Review Unit Eurocontrol
- 2012, CANSO, Global Air Navigation Service Performance Report 2012 [2007 – 2011 ANSP Performance Results]
- 2012, ANS charges (June) for States participating in the SES Performance Scheme
- 2012, ANS charges (December) for States participating in the SES Performance Scheme
- 2013, Annual Report and Accounts 2013, NATS Holdings Limited.
- 2013, EU Commission Implementing regulations (EU) No. 390/2013
- 2013, EU Commission Implementing regulations (EU) No. 391/2013
- 2013, Civil Aviation Authority, CAP 1004, Single European Sky – Market Conditions for Terminal Air Navigation services in the UK
- 2013, Eurocontrol – Performance Review Report - PRR 2012
- 2013, Eurocontrol - Overview of Terminal ANS Costs and Charges (2009-2014) for States participating in the SES Performance Scheme

Whilst a comprehensive and integrated summary document covering all aspects of the review did not exist for the NSL contracts, the following documents were provided. These collectively sought to support the forecast charges and where appropriate NSL's expenditure over the period, the range of services provided for this charge, the service levels resulting in the charge as well as detail within the contracts documents.

- TANS contract for each of the seven airports
- Summary data spreadsheet covering resourcing and charges

Also to inform the specifics of each airport, there have been visits and briefings at each air traffic control tower.

These documents are summarised as follows:

- 20130823 UK Zone B RP2 RT_TNC 2013 and airport tables
- 20131015 Introduction to NSL to Capita

- 20131015 LHR Presentation to Capita
- NSL Contract Performance Measures
- NSL Terminal Changing UK Zone B Supplementary Information
- NSL, TANS Summary, working document

In addition to the various client briefing meetings with the CAA, as well as briefing meetings with NSL. Example minutes of these meetings are attached in Appendix A.

- 15th October 2013 – NSL and LHR ATC tower visit
- 30th October 2013 – LGW tower visit
- 4th November 2013 – GLA tower visit
- 4th November 2013 – EDI tower visit
- 5th November 2013 – MAN tower visit
- 6th November 2013 – STN tower visit
- 6th November 2013 – LTN tower visit

2. Context and Overview

2.1 General Context and Regulations

Air traffic services across Europe are benchmarked at an ANSP level i.e. on a ‘gate to gate’ basis that includes all en-route, approach and tower services provided by that ANSP. Eurocontrol reports are issued periodically with the most recent applicable comparison at ANSP level undertaken for the year 2011. Overall NATS performance, covering its full ATC service at all 15 of the airports it covers, in 2011 at €385/composite flight hour is below the European average of €423¹:

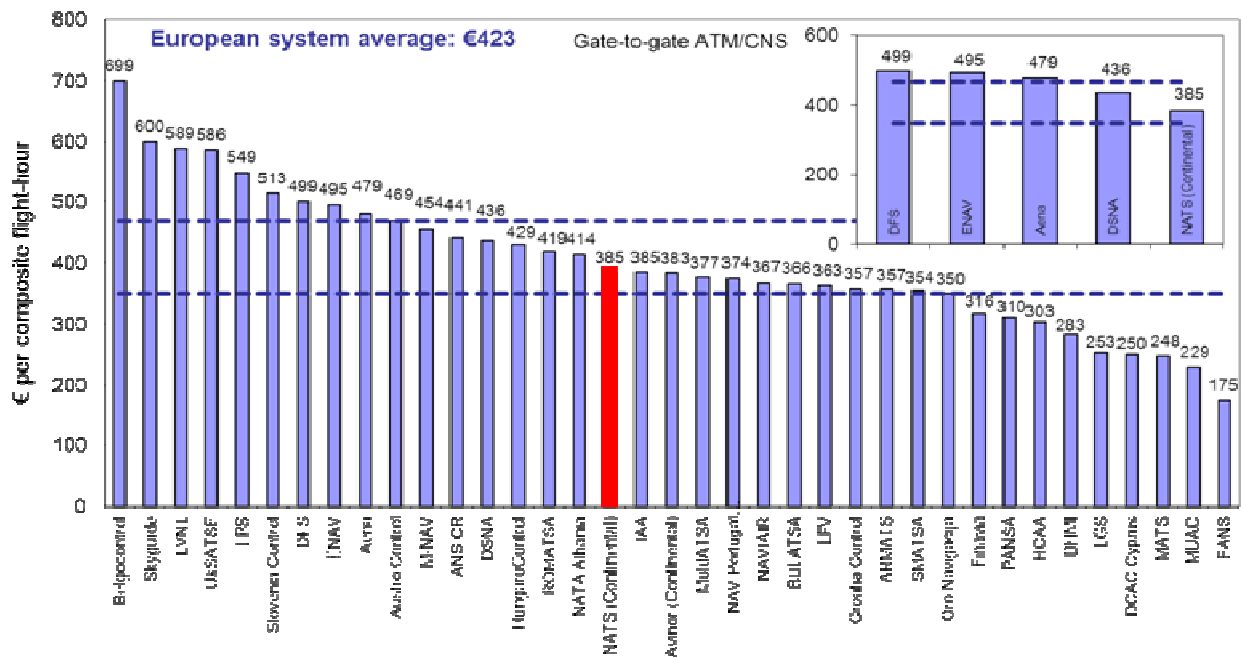


Figure 1: Composite Flight Hour Cost Comparison (Eurocontrol 2011 benchmarking report)

Additionally it is recognised that the airspace in the London region is potentially the most complex airspace and approach in Europe². The initiative to manage the London airspace as a combined service within NERL addresses this complexity and results in the ‘London Approach’ being a separate function charged directly to airline users rather than to the London airports.

Under the Single European Sky regulations, ANSPs are required to submit costs returns twice a year. These returns are completed according to specifications set out in the SES Charging Regulation.

With regard to the TANS provision, in isolation, the latest applicable data is for 2012 within the RP1 period and therefore not directly comparable to this RP2 review (note: reporting periods tend to have differing scope and airport content). The UK Zones A & B total 2012 TANS charges at the 13 in-scope airports are circa €152 million represented approximately 9½% of the EU costs for this service as indicated in the following table:

¹ Eurocontrol ACE Benchmarking report 2011 (on a ‘gate to gate’ basis)

² Eurocontrol ACE Benchmarking report 2011 (p104) contains an analysis of complexity. This shows that the London Terminal Control centre as the highest complexity score in Europe (score 33.5 average complexity score), with next busiest centre being Langen (aggregate complexity score 14.5)

No	Terminal Charging Zone	Airports covered in 2014	% TCZ Terminal ANS costs in SES total costs in 2014 (EUR)	Total Terminal ANS costs in 2009 ('000 EUR) A	Total Terminal ANS costs in 2010 ('000 EUR) A	Total Terminal ANS costs in 2011 ('000 EUR) A	Total Terminal ANS costs in 2012 ('000 EUR) A
1	Austria	6	2.5%	34 240	37 020	36 486	36 689
2	Belgium	1	2.2%	35 552	34 481	37 007	35 195
3	Bulgaria	5	0.7%	12 101	11 672	11 723	11 712
4	Cyprus	2	0.5%			7 434	7 647
5	Czech Republic	4	1.5%	23 034	23 714	22 462	20 556
6	Denmark	1	1.6%	24 830	22 346	26 515	26 362
7	Estonia	2	0.1%	1 076	1 039	1 278	1 988
8	Finland	1	0.9%	19 219	21 757	14 102	14 654
9	France	60	17.8%	265 468	269 193	271 492	268 435
10	Germany	16	14.6%	208 968	222 129	225 936	236 117
11	Greece	1	1.3%	27 324	25 614	25 636	21 003
12	Hungary	1	1.1%	17 514	18 522	17 995	15 777
13	Ireland	3	1.4%	21 783	23 241	25 246	23 163
14	Italy	47	14.4%	180 118	212 110	223 945	227 483
15	Latvia	3	0.5%			7 013	6 652
16	Lithuania	4	0.3%	2 743	3 178	3 307	4 012
17	Luxembourg	1	1.1%	12 204	12 071	13 155	14 187
18	Malta	1	0.2%				2 664
19	Netherlands	4	3.4%	62 604	55 908	55 545	51 423
20	Norway	4	3.9%		52 998	53 523	54 174
21	Poland	14	2.1%	29 735	28 138	29 439	29 463
22	Portugal	9	1.9%	28 746	27 075	31 228	29 578
23	Romania	2	0.8%	8 093	7 551	8 064	9 511
24	Slovak Republic	6	0.4%		5 528	5 625	5 879
25	Slovenia	3	0.3%	4 080	3 528	3 914	3 686
26	Spain	12	8.4%	296 699	207 969	193 055	171 080
27	Sweden-Arlanda	1	1.4%	21 305	23 344	20 858	24 535
28	Sweden-Landvetter	1	0.2%	2 607	2 954	2 927	3 274
29	Switzerland	2	5.2%	80 797	82 916	78 857	75 393
30	UK-Zone A	9	3.9%	68 658	66 408	61 593	62 907
31	UK-Zone B	4	5.6%	92 207	86 689	87 294	89 547
TOTAL (all):		230	100.0%	1 581 704	1 589 093	1 602 655	1 584 746

Figure 2: TANS Cost Comparison [2013 nominal] (Eurocontrol TNC preliminary data June 2013)

However, it should be noted there is a wide divergence of reporting practice across the EU, with some complying exactly with the minimum requirements of the regulation and others going beyond these minimum reporting requirements (e.g. France's reported costs cover 60 airports in France). Simple comparisons between the data should therefore be undertaken with caution.

The EU Commission implementing regulation (EU) No. 390/2013 of 3rd May 2013 revised the performance scheme for air navigation services and network functions. For TANS services, the threshold for inclusion in the scope of the performance scheme is raised to 70,000K IFR movements per annum, which has the effect of removing 5 UK airport TANS services from the scope of the scheme compared to RP1. Annex I of the Regulation defines Key Performance Indicators (KPI) and Performance Indicators (PI) for EU target setting and preface monitoring at Union level. The RP2 KPI's are Safety, Environment, Capacity and Cost Efficiency. It also addresses both en route and terminal air navigation services. It should be noted that:

- 'performance indicators' means the indicators used for the purpose of performance monitoring, benchmarking and reviewing;

- ‘key performance indicators’ means the performance indicators used for the purpose of performance target setting;
- ‘data’ means qualitative, quantitative and other relevant information relating to air navigation performance collected and systematically processed by, or on behalf of, the Commission for the purpose of implementing the performance scheme;

In section 2 of Annex I, it describes local target setting and performance monitoring at a local level for both the Key Performance Indicators and the Performance Indicators. More specifically, in terms of cost efficiency,

- Key Performance Indicator, the determined unit cost(s) (DUC) for terminal air navigation services, defined as follows:
 - the indicator is the result of the ratio between the determined costs and the forecast traffic, expressed in terminal service units, contained in the performance plans in accordance with Article 11(3)(a) and (b); EN 9.5.2013 Official Journal of the European Union L 128/17
 - The indicator is expressed in real terms and in national currency;
 - The indicator is provided for each year of the reference period.
 - For the purpose of these two indicators, local means at charging zone level.

In addition EU 391/2013 lays down a common charging scheme including costing proforma sheets for air navigation services. It allows for certain exemptions where market conditions prevail³.

The CAA addressed this issue in CAP 1004 and concluded

“The CAA considers that there is evidence pointing in different directions in judging market conditions against the criteria set out in Annex 1 of the Regulation. On the one hand, there are no statutory legal barriers - the market is liberalised and airport operators can choose to switch TANS provider. However, the degree of movement in the UK market and actual switching to date has been low.

Although the CAA has not identified any statutory barriers to service providers being able to provide or withdraw the provision of TANS in the UK, it has identified three economic barriers that may limit their ability to do so in practice. These economic barriers include a lack of clarity on the relationship between NATS Services Limited (NSL) and NATS En Route Limited (NERL), NATS Deed of a Trust of a Promise (ToaP) and air traffic control officer (ATCO) licensing requirements and career progression. Balanced against these barriers are a number of factors that might be considered to promote the development of market conditions. These factors include: the presence of competition law, the duration of contracts, and the arrangements in place for the transfer of physical and intellectual assets.

In drawing this evidence together, the CAA has taken into account all stakeholder views. With the exception of NSL, most stakeholders have indicated that they do not perceive that market conditions currently exist for airports over 70,000 IFR movements per year. These perceptions are influenced by airport operators’ current risk tolerance for what is a vital service and one that is often provided in a complex operating environment. It also reflects their current view on the breadth and track record of viable alternative providers. However, the CAA does not consider that these perceptions are, on their own, the reason for the relative lack of movement witnessed in the market. The potential economic barriers identified above may also have a role.”⁴

Hence in this study the benchmarking and format of costing should be in accordance with EU 390/2103 and CAP1004. The data used in CAP 1004 e.g. IFR data is also used here. The data format supplied by NSL is in accordance with EU 390/2013 albeit some aspects have been redacted.

³ EU 390/2013 and 391/2013 Commission Implementing Regulations

⁴ CAP 1004 Fig 7: TANS provided at Each Airport

For the total period of RP2 namely 2015 - 2019, the forecast total charges for TANS at the seven airports is circa £664m. This forecast is based on current contractual terms. All the contracts expire in the course of RP2. After expiry, for these charge reporting purposes, NSL has assumed that the existing contractual terms remain. However, the actual charges and contractual terms will be a product of the airport operators' commercial procurement process.

The allocation of approach costs (APP) to en-route and terminal cost bases varies between airports in the UK (with London Approach provided by NERL) and significantly between States. Of those States which do specify how this is done, seven (e.g. Czech Republic, Slovakia, Netherlands, Belgium) use distance-based allocation (the "20km rule"), and others (such as Slovenia and Norway) allocate fixed shares to each. More generally, for many States it is not apparent from the information submitted to the European Commission whether the scope of service, asset ownership and costs are fully comparable to those in the UK, and whether costs are reported in a consistent way⁵.

TANS unit costs are considered by the Performance Review Report (PRR 2012) to look particularly low in the UK TCZ B (€90 per TNSU)⁶. This could be partly due to approach control for the London airports being recovered through a separate London Approach Charge, for which no cost information is currently separately reported to the European Commission. Eurocontrol also suggests another reason could be the significant larger scale of operations at the UK TCZ B (airports > 150,000 commercial movements) compared to any other TCZ. Finally, another explanation from Eurocontrol could be the greater cost-efficiency provided by the UK model of potential "contestability" for aerodrome ATC services rather than the public sector provision in other TCZs. It is the benchmarking together with consideration to these particular issues that deserve further understanding to ensure a fair cost efficiency comparison.

In conclusion, a number of different reports on TANS costs are collected and published by the EC and Eurocontrol (ACE benchmarking, RP1 reporting tables and the Performance Review Report). These reports are based on different scopes of service and reporting methodologies and therefore are not necessarily directly comparable.

2.2 Structure of NATS and NSL

NATS Limited has two wholly owned operating subsidiaries namely NERL and NSL.

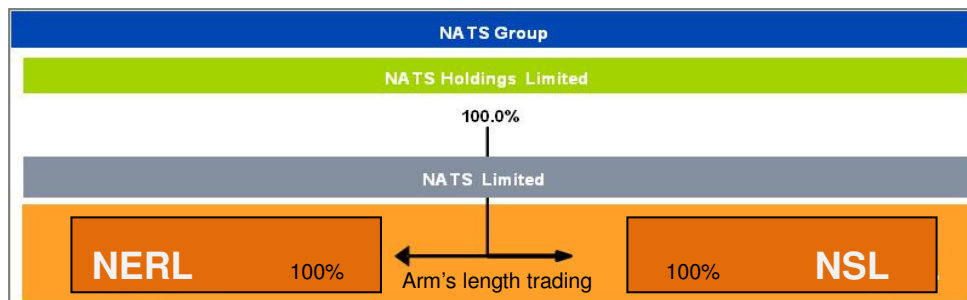


Figure 3: NERL within the NATS Group

The NSL business may be summarised as managing the Approach Control and Terminal control functions as well as "supplementary air navigation services" at airports. NERL, as well as handling the en-route functions, also handles the London Approach service for Heathrow, Gatwick, Stansted, Luton, Northolt, Southend and

⁵ There is some evidence of a divergent approach to pension arrangements, cost allocation models and cost of capital across European ANSPs.

⁶ EU Performance Review Report 2012

London City airports. The latter service is provided from Swanwick Terminal Control ensuring these airports' runways and surrounding airspace are managed in an integrated way.

The arrangement is indicated in the following graphic:

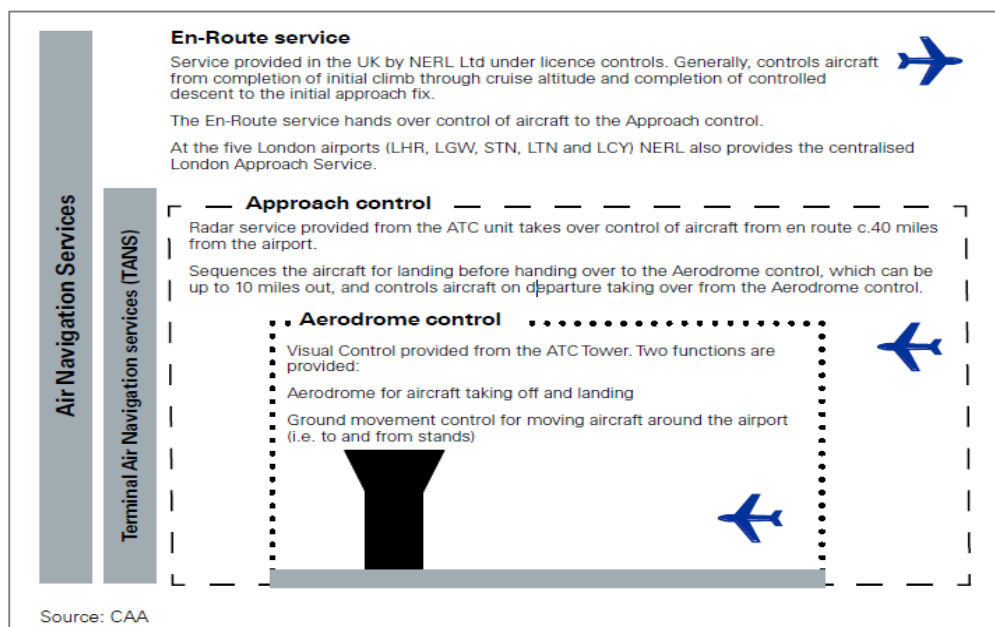


Figure 4: NSL Approach and Aerodrome Control (source CAP1004)

The CAA has recently considered the treatment of the London Approach charges⁷. Its consultation document included NERL estimated respective revenues and forecast charges for this function for the period 2012/13⁸. The costs for London Approach were based on figures provided by NERL to the CAA for the current London Approach function provided at Swanwick Air Traffic Control Centre. These costs reflected a fairly full allocation of costs at Swanwick some of which would not be necessary if the approach service was provided at the airport⁹. It remains to be determined how much of the London Approach service provides a service that should be considered en-route.

⁷ CAP 1098 'Regulatory treatment of London Approach charges in Reference Period 2 (2015-19) of the Single European Sky Performance Scheme – a consultation document' (October 2013)

⁸ CAP 1098 October 2013 Figure 1

⁹ The CAA recognised that there may be different reasonable ways to allocate costs that cannot be causally linked to a given activity.

	2012/13 (fully allocated accounting costs)	2012/13 (fully allocated determined cost basis)
LA: forecast costs	£27.7 million	£37.3 million
LA: revenue	£11.2 million	£11.2 million
Difference	£16.5m million	£26.1million
Percentage of planned costs of relevant workstations covered by planned revenue	40.4%	30.0%

Figure 5: London Approach estimated revenues and costs 2012/13 (source: CAP 1098/NERL)

Whilst a specific review and benchmarking of the costs of NERL’s London Approach control function falls outside the scope of this study, it is recognised that the function is an integral component of TANS at airports other than those serving London. To facilitate the benchmarking of the London airports an indicative adjustment derived from the estimates within CAP 1098 has been utilised within this report as detailed in section 2.4 following.

The NSL cost base is characterized, on the one hand, by its legacy staffing costs including high pension costs, working practices, high levels of staff training, etc. NSL has progressively addressed such components of its cost base within its control but on the other hand it must still respond to its client’s particular requirements in respect of service continuity and resilience, retention and training of staff at each airport, etc. The resulting charge for its TANS function reflects these constraints and requirements which are in part particular to the UK market.

2.3 Contract & Service Variability

2.3.1 Contract

Arrangements for TANS services in the UK are generally based on a fixed annual fee which includes a significant liaison and support function to both the airport operator and its customers. Contracts can also include performance based incentives and penalties. The details of these arrangements vary with the requirements of the airport operator.

The UK TANS market is progressively opening to competition, all current NSL contracts in the UK considered in this report, with the exception of Luton, have been let following, often extensive, commercial negotiations between the airport operator and NSL. Contracts are generally service (rather than resource) based and are characterized by their fixed annual fee nature which often incorporates a fluctuations provision for annual inflation over the contract period. They also include incentivisation allowing both positive and negative periodic adjustment for performance, based on KPI achievement.

The TANS provision at a number of the smaller UK airports is done on a self-provision basis often relying upon elements of training and support from NSL.

The ‘contestable’ fixed fee basis is favoured by the airport operators providing an appropriate transfer of risk, cost certainty and an inclusive cost approach covering the provision of the, not inconsequential, secondary service support¹⁰.

The following information is also relevant to the overall NSL contracts at each airport. The classification of airports into tiers by IFR volume reflects the approach generally taken in previous studies reflecting the potential impact of scale on service provision (see also 2.3.3 below). It should be noted that the TANS supplier, being NSL in each case, has not changed in the last 10 years at these airports although Luton has been retendered and won. ✂ It should be noted that the scope of services provided at each airport also varies¹¹. The following table details the disclosed estimated TANS charge at each airport assuming current contracts are renewed or extended on a comparable basis (requirements, terms, conditions, charge etc) inclusive of indexation. The actual TANS charges after the expiry of the current suite of contracts will be a result of the contract tender process run by the airport operators.

Tier 1 - >145,000 IFRs			Tier 2 - > 65,000 IFRs		
Airport	Projected Costs (2015-2019)	Expiry Date	Airport	Projected Costs (2015-2019)	Expiry Date
Heathrow	✂	31-Mar-18	Edinburgh	✂	31-Mar-18
Gatwick	✂	31-Mar-15	Luton	✂	31-Oct-15
Manchester	✂	31-Mar-15	Glasgow	✂	31-Mar-18
Stansted	✂	31-Mar-18	Birmingham	✂	Excl.

Figure 6: TANS Contract Details – Programme and Value (source CAP 1004)

¹⁰ Stakeholder liaison, policies & procedures, risk assessment, airfield efficiency initiatives, training, project support, reporting, visits etc

¹¹ NSL Information – Confidential

The TANS functions vary at each of the airports under consideration with each function, in the following chart, detailed further in their respective sections:

	Airport	Aerodrome ATC	Approach ATC	Asset Maintenance	Provision of Assets (e.g. leasing)	Property Rental
Tier 1 > 145,000 IFRs	Heathrow	✓	NERL	✓	✓	✓
	Gatwick	✓	NERL	✓	✗	✓
	Manchester	✓	✓	✓	Owned by airport operator	Free of Charge
	Stansted	✓	NERL	✓	✓	✓
Tier 2 > 65,000 IFRs	Edinburgh	✓	✓	✓	✓	✓
	Luton	✓	NERL	✓	Owned by airport operator	Free of Charge
	Glasgow	✓	✓	✓	✓	✓

Figure 7: TANS Services provided at Each Airport (source CAP 1004)

The importance placed on the TANS service by each airport operator is significant and driven by the consequential costs of a loss of service. The following provides an indication of the impact of a reduction in TANS service should it not meet the appropriate service levels:

Airport	Impact of a Reduction in Service
Heathrow	Heathrow Airport Limited (HAL) estimated that a 10% reduction in movements would cost the airport operator £370,758 per day and £741,515 per day for a 20% reduction. This equates to significantly more than the cost of the ANS contract per day.
Gatwick	Gatwick Airport Limited (GAL) considered that the airport operator would only transition between service providers in the winter to minimise the risks of service loss in the busy summer period. It noted for that period of the year the airport does not operate at full capacity and would therefore be able to recover from some disruption in the short term.
Manchester	Given the traffic mix at Manchester, Manchester Airport Group (MAG) considered that it is unclear what a reduction in service would mean in terms of costs as the loss of different slot times would affect different airlines. MAG stated that the complete closure of the airport for ash clouds had cost the airport operator in the region of £6m in revenue over 4 days.
Stansted	Stansted Airport Limited (STAL) considered that the impact of a small reduction in hourly capacity following the introduction of a new operator would not be significant at the current time because of the degree of spare capacity available. It considered that given its current traffic levels the risk of disruption during a transition period would be low. However it noted that disruption in its peak hours would affect the business and the confidence that airlines had in the airport, which could be significant in the longer term.
Other airports	The responses from the tier 2 and 3 airport operators were in a similar vein to those of MAG and STAL. A number noted that the impact varies with the traffic affected. Most, however, were comfortable that in the short term they would be able to handle some reduction in air transport movements as they were not operating near their declared capacity. Concerns were also made about the impact that any disruption would have on the airport operator's ability to retain and attract new airline business.

Figure 8: Effect of Reduction in Service Levels (source CAP1004)

2.3.2 Services

The NSL service, and that at other airports, varies in scope for a number of reasons. Primarily the service is driven by the inclusion, or otherwise, of the Approach service. It is also heavily influenced by movement volumes hence the two tier categorization of airports adopted.

NSL's service at each airport, in the tower control room, includes arriving and departing flight control, ground movement planning and control (aircraft and vehicles), meteorological observations and Airfield Ground Lighting wayfinding operation. These functions can be collectively grouped as an ATCO function. The ATCO function also covers the airport specific ATC training as well as the provision of all secondary service support.

In each case NSL provides, at least, the first response to ATC related assets maintenance and repair and in most cases full maintenance. This function can be grouped as an engineering function.

Additionally the NSL resource at each airport is managed and administratively supported by a small team comprising a general manager and at least one deputy, administrative staff and in some cases drivers. The latter facilitating airside visits and ATCO accessibility in periods of adverse weather where staff would otherwise not access the airport in non-specialist vehicles.

	Airport	Aerodrome ATC	Approach ATC	Asset Maintenance
Tier 1 > 145,000 IFRs	Heathrow	✓	NERL	✓
	Gatwick	✓	NERL	✓
	Manchester	✓	✓	✓
	Stansted	✓	NERL	✓
Tier 2 > 65,000 IFRs	Edinburgh	✓	✓	✓
	Luton	✓	NERL	✓
	Glasgow	✓	✓	✓

Figure 9: NSL service provision by airport (source CAP 1004)

2.3.3 Volume

In terms of this study the NSL services are limited to those over 70,000 IFR movements (note the CAA introduced a 5,000 IFR movements tolerance to accommodate annual variations in demand prior to RP2), and the airports may be summarised as follows¹²:

Tier 1 - >145,000 IFRs			Tier 2 - > 65,000 IFRs		
Airport	IFRs	ATCO Resource	Airport	IFRs	ATCO Resource
Heathrow	475,395	✂	Edinburgh	192,405	✂
Gatwick	246,933	✂	Luton	98,255	✂
Manchester	168,506	✂	Glasgow	77,506	✂
Stansted	141,839	✂	Birmingham	Excl.	✂

Figure 10: IFRs and ATCOs at Each Airport 2012 (source CAP 1004)

¹² CAP 1004 SES Market Conditions

The principle impacts of the two tier categorisation is operationally in the resilience of service requirement at the larger volume airports (LHR & LGW) and in the measure of cost efficiency, where high volumes would conventionally drive efficiency when costs are expressed by IFR movements.

2.3.4 Operational Hours

The Tier 2 movement volume is such that all airports under consideration require a full time TANS service provision 365 days a year albeit the service is at reduced levels during night times. The service involves a 3 shift day with varying active and rest periods in each shift. Each airport has its dedicated NSL staff, as a result of airfield specific competencies, resulting in 'within resource' coverage of shifts and absence periods. This latter specialist self-provision at each location is a characteristic of the service with its degree of inherent lack of cost flexibility. Staff cannot easily transfer between TANS contracts without additional bespoke training and certification.

2.3.5 Airfield Capacity & Complexity

Single and double runway operations (and runway crossings) influence the resourcing with a Flight Controller assigned to each of the runways in simultaneous operation. Linked to the runway provision is also the airfield configuration impacting the manoeuvring of aircraft including the efficiency of taxiways, on and off pier service, potential for push-back constraints, etc. Similarly the complexity of vehicle routing and movements determine the extent to which NSL must resource this aspect of the service.

2.3.6 Equipment provision

In turn the service cost is also influenced by the provision and maintenance of the ATC related assets. Each airport has a varying provision of equipment as a result of its physical characteristics.

There is also variation in the ownership, financing and maintenance of assets at each airport as indicated in the following chart. Equipment ownership and therefore its financing and cost recovery are indicated in the following charts. In all case ATC related asset maintenance is undertaken by NSL, while airfield lighting maintenance is undertaken by the airport operator.

The approach to maintenance of equipment is that whilst NSL provides the maintenance service at each airport it does so through varying sources which impact the comparability of staff cost benchmarking. Front line – first line/emergency services are undertaken on a self-provision basis using staff engineers. Non-critical repairs and planned maintenance is generally outsourced by NSL and hence is included in 'other direct costs' under 'other operating costs' in the comparisons.

Tier 1 - >145,000 IFRs				Tier 2 - > 65,000 IFRs			
Airport	Tower Building	Equipment	Property Rental	Airport	Tower Building	Equipment	Property Rental
Heathrow	Airport	Mainly 3 rd party with some NATS owned	✓	Edinburgh	Airport	Mainly 3 rd party with some NATS owned	✓
Gatwick	NATS	Mainly 3 rd party with some NATS owned	✓ NSL owned Tower	Luton	Airport	Mainly airport with some NATS owned	Free of Charge
Manchester	Airport	Airport	Free of Charge	Glasgow	NATS	Mainly 3 rd party with some NATS owned	✓ NSL owned Tower
Stansted	NATS	3 rd party leased contract	✓ NSL owned Tower	Birmingham	Excl.	Excl.	Excl.

Figure 11: NSL ATC related equipment ownership by airport (source CAP 1004 + rental column insert)

Note: 3rd Party in the above graphic means NSL responsibility via leasing arrangements but charged to Airport

2.3.7 Accommodation and other charges

The ATC tower and associated accommodation is in some cases provided by the airport owner in the UK. In some of these cases no charge is made to the TANS provider for this provision. As can be seen in the above chart a number of the airports levy a charge which, in turn forms a component of the TANS charge from NSL to the airport operator. This latter arrangement has applied at the former BAA owned airports under consideration.



Figure 12: ✂

In relation to the NSL ATC related asset ownership, the following should be noted:

- Heathrow, Gatwick and Stansted - PSR/SSR assets are owned by NERL and are used primarily in the provision of the approach service at these airports which is delivered under NERL's License.
- Primary and Secondary Radar data is provided to a number of airports that do not have their own airfield radars by NERL through provision of onward routed radar data feeds from NERL owned radars. A fee is payable for this feed.

2.4 Service Charge Comparison Adjustment

Given the variability in demand, service requirements, airport operators' capacity requirements, conditions and characteristics at airports, both in the UK and the broader EU, the TANS charges in their raw form do not aid financial comparison. A simple denominated approach, whether by the Eurocontrol adopted metric of Terminal Service Units¹³, or the simple IFR movement metric used in this review which provides one possible comparison. It does not however reflect the complexity, inclusions and exclusions in service which characterize TANS charges across the wide range of airports.

Capita has briefly reviewed the implication of charging in terms of the TSUs adopted by Eurocontrol rather than IFRs. In TSU terms each aircraft is given a comparative TANS rating with an A380 aircraft rated as 4.43, a B747 as 3.35 and an A320 as 1.20.

The implication is that the annual charge for a TANS service based on TSU demand will be highest in the UK at LHR, with some 35% wide body aircraft, and to a lesser extent at the other UK airports which have a higher proportion of Code C aircraft (for example A320 and B737). With a fixed service TANS cost, as the proportion of wide body heavier aircraft increases, the corresponding charge efficiency improves in TSU terms. Conversely with greater lighter narrow body aircraft the TANS charge efficiency decreases in TSU terms.

Consequently, should this review be repeated in TSUs as opposed to IFRs (i.e. aircraft type is considered in the benchmark calculation), the charge for the TANS function at LHR for Code C aircraft, when taken in isolation, would probably appear far more competitive than that in the broader results of this review and in comparison to the other airports where the dominant aircraft type is currently Code C.

Within this IFR based review, to aid comparison an indicative adjustment has been included to the TANS charge, at the London airports, to compensate for the absence of the Approach charge (service provided by NERL). For the purposes of the comparison, the 2012/13 estimates of revenue and cost contained within CAP 1098 have been taken as indicative of the likely position in 2015¹⁴. As not all the London airports are considered within this review a notional 90% of the £11.2m revenues and costs have been taken to collectively apply to Heathrow, Gatwick, Stansted and Luton,

Additionally in the cases of Manchester and Luton estimated adjustments have been included to try to compensate for the absence of accommodation and equipment charges otherwise included at other airports. These adjustments substitute comparative charges from other airports rather than calculating a true charge from first principles.

Whilst the application of adjustments is not promoted as an ideal solution, it does provide an estimate of equalizing adjustments which potentially provide a better understanding of the respective TANS charges when viewed in an IFR movement denominated basis. Both the unadjusted and adjusted charges are indicated for each of the UK airports under consideration and in turn to the EU benchmark airports although the data available on the latter must be recognised as requiring greater validation than afforded by this report and therefore in detail the validity of the benchmarking comparison should be treated with caution.

¹³ $(\text{Max Take-Off Weight}/50)^{0.7}$

¹⁴ No forecast being otherwise available actual 2012 charge taken to be suitable for 2015

3. Overview

3.1 Overview of RP2 (2015 – 2019)

The total TANS charge for all airports under consideration is shown on the following table. Of the total charge of circa £664m for the period,



All charges in the table are expressed and taken to be in nominal terms i.e. 2015 includes inflation from the current date. All contracts are planned for re-tender during the RP2 period but for the purposes of the RP2 forecasts are taken to continue on the same terms and conditions. The actual charges after the expiry of the current contracts will depend on the outcome of the contract tender processes run by the airport operator.

Financial data forecast by NSL in the following table (June 2013 nominal terms) has subsequently been updated by NSL and used in this study. The data continues to be reviewed by NSL in forecasts to CAA.

Table 1 - Total Costs and Unit Costs

Charging zone name	UK Zone B - Terminal					Period of reference : 2015-2019				
Currency	GBP									
Entity name:	ANSP									
	Determined costs (performance plan)					Actual costs				
Cost details	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1. Detail by nature (in nominal terms)										
1.1 Staff	51,963	50,947	52,403	53,811	55,142					
1.2 Other operating costs	56,050	57,480	58,907	60,122	61,306					
1.3 Depreciation	1,009	754	526	474	483					
1.4 Cost of capital *	20,182	20,113	20,429	20,615	20,762					
1.5 Exceptional items	286	282	288	290	290					
1.6 Total costs	129,490	129,576	132,553	135,311	137,983					
Total % n/n-1		0.1%	2.3%	2.1%	2.0%					
Staff % n/n-1		-2.0%	2.9%	2.7%	2.5%					
Other op. % n/n-1		2.6%	2.5%	2.1%	2.0%					
* See section E for additional information										
2. Detail by service (in nominal terms)										
2.1 Air Traffic Management	109,715	109,788	112,310	114,647	116,911					
2.2 Communication (1)	3,125	3,127	3,199	3,265	3,330					
2.3 Navigation (1)	5,088	5,091	5,208	5,317	5,422					
2.4 Surveillance (1)	10,405	10,412	10,651	10,872	11,087					
2.5 Search and rescue	0	0	0	0	0					
2.6 Aeronautical Information (1)	0	0	0	0	0					
2.7 Meteorological services (1)	1,158	1,158	1,185	1,210	1,233					
2.8 Supervision costs	0	0	0	0	0					
2.9 Other State costs	0	0	0	0	0					
2.10 Total costs	129,490	129,576	132,553	135,311	137,983					
Total % n/n-1		0.1%	2.3%	2.1%	2.0%					
ATM % n/n-1		0.1%	2.3%	2.1%	2.0%					
CNS % n/n-1		0.1%	2.3%	2.1%	2.0%					
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3. Complementary information (in nominal terms)										
Average asset base (see Section E for additional information)										
3.1 Net book val. fixed assets										
3.2 Adjustments total assets										
3.3 Net current assets										
3.4 Total asset base										
Cost of capital % (see Section E for additional information)										
3.5 Cost of capital pre tax rate										
3.6 Return on equity										
3.7 Average interest on debts										
Cost of common projects										
3.8 Total costs of common projects										
Costs exempted from cost sharing (Article 14(2)(b))										
3.9 Total costs exempted from cost										
4. Total costs after deduction of costs for services to exempted flights (in nominal terms)										
4.1 Costs for exempted VFR flights										
4.2 Total determined/actual costs	129,490	129,576	132,553	135,311	137,983					
5. Cost-efficiency KPI - Determined/Actual Unit Cost (in real terms)										
5.1 Inflation % (2)	1.75%	1.80%	1.90%	1.91%	1.98%					
5.2 Price index (3)	105.3	107.2	109.3	111.4	113.6					
5.3 Total costs real terms (4)	122,918	120,826	121,297	121,495	121,483					
Total % n/n-1		-1.7%	0.4%	0.2%	0.0%					
5.4 Total Service Units										
Total % n/n-1										
5.5 Unit cost										
Total % n/n-1										

Figure 13: Forecasts contained in NSL June RP2 cost reporting submission (Source: CAA)

3.2 Inflation

Annual cost fluctuation (inflation or deflation) has a limited bearing on this review given that all charges herein are expressed in nominal 2015 price terms with subsequent years inflated using NSL forecast indices. These do not appear unrealistic given current expectations.

By way of background, since 2008, there has been low economic activity and confidence. Demand at airports has generally reduced although many TANS contracts are fixed fee, the cost fluctuation provisions have applied although adjustments have been modest reflecting general economic inactivity. Supply prices in many areas, with the notable exception of utilities costs and employment costs, have dropped and wages have generally only modestly increased.

The October 2013 European Harmonised Consumer Price Index (HCIP) was reported as 0.74%, while the current UK CPI has reduced to 2.17%. The Bank of England's forecast is set at 2.00%.

Through continuing attention to legacy costs and through staff retirement, NSL's cost base is increasingly reflecting market conditions with legacy pension and other historic provisions naturally reducing. For example, NATS has made two rounds of significant changes to its defined benefit pension scheme to mitigate the costs associated with this scheme. Notwithstanding this NSL faces continuing cost pressures in its funding of its legacy pension schemes and in line with recent trends this can be expected to remain a constant challenge during RP2 and beyond and consequently a further burden over and above that otherwise reflected in published indices.

The table below provides a range of forecasts from different sources.

Financial year	CPI (Office of Budget Responsibility)	RPI (HM Treasury ¹⁵)	CPI (Harmonised Consumer Price Index ¹⁶)
2013 - 14	2.6	3.1	2.2 – 2.9
2015	2.5	3.0	2.0
2016	2.2	3.2	2.0
2017	2.0	3.5	Not available
2018	2.0	Not available	Not available
2019	2.1	Not available	Not available

Figure 14: Forecast inflation allowances (annual % adjustments)

¹⁵ November 2013 Independent Average Forecast

¹⁶ Bank of England Inflation Report November 2013

4. Review of Tier 1 >145,000 IFR movements

4.1 Overview

✂

✂

Figure 15: ✂

The impact of IFR movement demand necessitates further consideration. The airports have a forecast demand ranging from 148,000 at Stansted to 478,000 IFR movements at Heathrow. With the exception of Heathrow where movements are constrained and have remained relatively constant, the other three airports have experienced reductions in annual movements since the pre-recession peak in 2007. In the five years since their peak, movements have reduced by 7% at Gatwick and nearly 30% at both Manchester and Stansted. These three airports have under-utilised capacity, and therefore potentially higher TANS charge per IFR movement, with all forecast to grow but importantly not necessarily to a full-day demand profile which reflects the level of service and resourcing generally driven by the peak busy periods in the day .

There remains an underlying constant, as all four airports source their TANS function from NSL on varying versions of fixed fee service driven contracts. Whilst the client requirement may vary there will be a consistency in provision given the use of the same provider and its systems and procedures.

The contract services, and therefore charges, at the airports are relatively fixed in nature when demand varies. Under the terms of the contracts the airport operator carries the cost risk in periods of reduced demand and the

provider (NSL) in periods of increasing demand. This inflexibility is further compounded by the 24 hour operation required by the airport operator which necessitates a staffed three shift day. The nature of the ATC operation means that while the winter and summer schedule can differ in terms of airport movements, the level of resource NSL requires to deliver these different schedules does not vary significantly unless there is a very significant change in demand or airfield infrastructure.

NSL's TANS contracts are generally fixed price in nature and do not have significant volume risk associated with them. This is because within certain parameters, the level of resource and therefore the level of charge associated with delivering different levels of ATC capacity do not change significantly (e.g. within certain parameters, an increase in movements on a single runway may, or is likely to, require the same level of resource, and conversely a reduction in movements, often between the daily peaks in traffic, may not reduce the level of resource required to deliver the service).

It is also worth noting that in some cases as a result of commercial terms, the contract charges are profiled over a period of time to reflect the requirements of customers. This means the charges levied for any individual year may not necessarily reflect the underlying economics of the contracts over the whole of their terms.

Whilst Heathrow has a higher degree of resource matching and utilisation, the other three airports only forecast relatively small increases in movements from their current volumes and hence the service retains inherent challenges in utilisation given the characteristics of their operational day when compared to Heathrow.

Given the necessity for service in a number of functions and busy hour peaks in traffic there are only limited opportunities to introduce flexible resourcing and multi-skilling hence the TANS charge is higher per IFR movement at this stage in the economic cycle than would otherwise be the case with higher demand.

The logic evident in the comparison by annual charge in Fig 15 is also apparent in the following graphic indicating demand and charge per IFR movement.



Figure 16: ✂

Given the rather inflexible nature of TANS resourcing the charge per IFR proportionately increases with reducing demand.

Whilst there are clearly economies in scale with greater staff and asset utilisation, which are the prime influence on the charge per IFR movement, there are also a range of other complexities and contributors impacting the TANS charge. For example, the more intensively scheduled an airport operation, particularly as it approaches maximum capacity, the level of investment in technology and staff can increase significantly to be able to deliver that capacity and maintain the best possible resilience.

The specific service requirements, asset ownership and the complexity of the operational environment all impact to a degree the TANS charge efficiency. Some of the main variations include: the service requirements of the airport operator (opening hours, resilience in TANS operations etc), the pace of traffic recovery following the reductions post the 2007 peak, the complexity of the airport operations (which in turn drives the requirement for ground movement controllers), treatment of approach control (it is excluded for all the main London airports since NERL provides this service) and treatment of assets and property costs.

NSL's operational resourcing requirement is governed by the legal SRATCOH¹⁷ rules (set by the CAA) and its Working Practice Agreement (agreed with the NATS Trade Unions).

The treatment of ATC assets in particular varies considerably across the contract portfolio. Unlike in many other European countries where the TANS provider generally owns the relevant assets, in the UK the majority of the TANS assets are owned or leased by the airport operator.

These particular characteristics are considered by airport in the following sections.

¹⁷ Scheme for the regulation of air traffic controllers' hours.

4.2 Heathrow

4.2.1 Overview

NSL has been a long-term provider of the TANS function. Its contract expires in March 2018. The NSL service currently operates with a dedicated (self sufficient in many respects), NSL resident team reporting to the NATS Director Operations (Airports) reflecting the demands of this contract.



4.2.2 Service Characteristics

Heathrow is a large international hub multi-airline airport and has a degree of complexity in excess of both smaller hubs and point to point airports. The TANS contract is service and not resource based.

The top priority for all airport customers is the safety of their airport ATC services. Thereafter, the airport customers' priorities vary considerably. Heathrow, for example, is scheduled to utilize approximately 99% of maximum available capacity and therefore even minor adverse weather conditions can have a major impact on punctuality. In the case of Heathrow, the airport's priority is improving resilience and adherence to the schedule.



The approach control at Heathrow along with all other airports in the London system is characterised by NERL's provision of the London Approach function. Heathrow Tower therefore receives the approaching aircraft from NERL sequenced for arrival and handles the final approach function typically covering the final 7-8 nautical miles.

The TANS function at Heathrow is characterised by a number of aspects particular to the airport:

- Full capacity - High levels of service and resilience required. ATCO & management seniority requirement
- Tactical management as real time operations fails to adhere to pre-planned schedule TANS includes analytical support to HAL scheduling process
- Only Final Approach service as London Approach provided by NERL. Although final approach management is critical to achievement of the high movements – not mixed mode so separation and vortex avoidance is critical
- Dual segregated runways in simultaneous operation with daily ARR & DEP alternation at 1500hrs.
- Complex airspace, airfield and terminal arrangements with T4/Cargo runway crossing
- 365/24 TANS coverage
- Mixed fleet characteristic of a hub operation with high proportion of Code E (B747, B777, A340 families) aircraft
- Specific requirements for Code F (A380) aircraft including operational restrictions with all Code F movement based around the south runway. The volume of Code F movements will increase to and through the RP2 period
- 5 terminal multi pier layout with cul-de-sacs. In future this may reduce as and when the Terminal 1 facilities are remodelled.
- Continuous airfield build and repair disruption with implication to TANS and its equipment
- Final approach and departure flight control
- Aircraft ground movement planning, 'delivery' from stand function and control
- Vehicle movement control
- AGL operation (aircraft wayfinding)

- Heathrow Operational Efficiency Cell (perpetual joint efficiency improvement)
- Full VCR and systems contingency provision
- Full 3D simulator and on-site training succession programme
- Full engineering repair and maintenance support via self-provision and contractors to ATC related assets

The control tower and accommodation (including facilities management) together with utilities and business rates are provided and charged to NSL by the airport. NSL in turn recharges the same to the airport within its TANS charge.

The TANS contract includes a range of financial adjustments which can be applied by the airport should various aspects of the service be deficient. These are calculated using various IFR movement punctualities, environmental and overall performance considerations and if fully levied would represent \approx of the annual TANS charge.

NSL TANS Summary - LHR		
Driver and Component		LHR - 2015 (F Nominal) Data
Demand	Airport IFR forecast (thousand IFR pa, source: STATFOR September forecast)	478,000
	IFR actual (CY2012, thousand IFR pa, source: STATFOR)	475,000
	Pax (mppa)	75
	Runways	2
	Busy Hour	90
	Busy Month	7/11 - 42,030
	Operational Day	24hrs
	Night Coverage	Yes
	Change Orders/CAPEX impact	Risk fully borne by NATS for all people resource and assets included within the existing scope of the contract
	Spec	Bespoke service specification in line with airport operator requirements.
Service	Flight Control (Approach & Departure)	Yes
	Area Approach	No
	A/C Ground Movements	Yes
	Transport Ground Movements	Yes
	Stand & Movement Planning	Yes
	AGL Management	Yes
	MET Observation Services	Yes
	Runway crossings	Yes
	Others	Concurrent runways in switched variable modes
		Stakeholder liaison etc
		HOEC (Heathrow Operational Efficiency Cell - tactical real time management facility & service to optimise capacity/operations; Collaborative Decision Making Tool; Driver Training
	Accommodation & Utilities provision	By airport charge-levied
	Systems & Nav aids provision	NSL owned or leased
	Engineering provision	Engineering maintenance
	Training Requirement	Yes airport bespoke
Simulator	3D	
Contingency Facility	Yes Full	

Figure 17: LHR 2015 TANS function summary (source NSL)

4.2.3 Analysis



NSL TANS Summary - LHR		
Driver and Component	LHR - 2015 (F Nominal) Data UNADJUSTED	LHR - 2015 (F Nominal) Data ADJUSTED
Service Resourcing		
Price		
Contract Charges (NSL Figures)		

Figure 18: ✂

4.2.4 Cost Efficiency

✂

NSL TANS Summary - LHR		
Driver and Component	LHR - 2015 (F Nominal) Data UNADJUSTED	LHR - 2015 (F Nominal) Data ADJUSTED
Efficiency		

Figure 19: ✂

✂

4.3 Gatwick

4.3.1 Overview

NSL has been a long-term provider of the TANS function at Gatwick with its contract due to expire in March 2015. GAL has recently commenced the early stages of a competitive tendering process. The dedicated NSL service team resident at Gatwick reports to a Group Account Manager in NATS' Airport Service Line.

✂

4.3.2 Service Characteristics

The service at Gatwick is dominated by the highly utilised single runway with its busy hour performance at up to 60 ATMs. As with Heathrow, the Tower function at the airport excludes the London Approach service which is undertaken by NERL. Notwithstanding this, the final approach and departure function at the Gatwick Tower in busy periods is critical to achievement of the high utilisation on the single runway.

In comparison to many UK airports, Gatwick's traffic has remained relatively consistent despite the reduction in demand experienced by all following 2008. By 2015 movements will be ca. 7% below the 2007 peak although the reduction has not been reflected in the airport's busy hours with its large airport based fleet. Consequently NSL has had and will have little opportunity to moderate its service or resourcing.

The TANS function at Gatwick is characterised by a number of aspects particular to the airport:

- High volume single runway (ARR-DEP-ARR sequence)
- No Approach service as provided by NERL although final approach management is critical to achievement of the high movement achievement on the single runway
- 365/24 TANS coverage
- High proportion of Code C aircraft (less vortices)
- 2 terminal multi pier layout with cul-de-sacs
- Continuous airfield build and repair disruption
- Tactical management responding to real time failure of airlines to adhere to pre-planned schedule
- Final approach and departure flight control
- Aircraft ground movement planning, 'delivery' from stand function and control (High use of remote stands)
- Limited vehicle movement control
- AGL operation (aircraft wayfinding)
- High level of liaison with airport and airlines in joint efficiency improvement, safety cases etc
- Back-up VCR in old tower
- 2D simulator and on-site training succession programme
- Full engineering repair and maintenance support via self-provision and contractors to ATC related assets

The control tower and accommodation (including facilities management) and ATC related assets together with utilities and business rates are provided by NSL and charged to the airport as a component of the TANS charge.

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The following chart summarises key service data for the NSL contract at Gatwick:

NSL TANS Summary - LGW		
Driver and Component		LGW - 2015 (F Nominal) Data
Demand	Airport IFR forecast (thousand IFR pa, source: STATFOR September forecast)	251,000
	IFR actual (CY2012, thousand IFR pa, source: STATFOR)	247,000
	Pax (mppa)	34
	Runways	1
	Busy Hour	60
	Busy Month	895 in a day
	Operational Day	24 hrs
	Night Coverage	Yes
	Change Orders/CAPEX impact	Risk fully borne by NATS for all people resource; CAPEX requires change order within the confines of current operational scope
	Spec	Bespoke service specification in line with airport operator requirements.
Service	Flight Control (Approach & Departure)	Yes
	Area Approach	No
	A/C Ground Movements	Yes
	Transport Ground Movements	Yes
	Stand & Movement Planning	Yes
	AGL Management	Yes
	MET Observation Services	Yes
	Runway crossings	Yes
	Others	Standby runway
		Stakeholder liaison etc
		Aerodrome technical safeguarding; Driver Training; slot performance
	Accommodation & Utilities provision	By airport charge-levied
	Systems & Nav aids provision	NSL owned or leased
	Engineering provision	Engineering maintenance
	Training Requirement	Yes airport bespoke
Simulator	2D	
Contingency Facility	Yes Full	

Figure 20: LGW 2015 TANS function summary (source NSL)

The TANS contract includes a range of financial adjustments which can be applied by the airport should various aspects of the service be deficient. These are calculated using various IFR movement punctualities, environmental and overall performance considerations and if fully levied would represent \approx of the annual TANS charge.

4.3.3 Analysis

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NSL TANS Summary - LGW		
Driver and Component	LGW - 2015 (F Nominal) Data UNADJUSTED	LGW - 2015 (F Nominal) Data ADJUSTED
Service Resourcing		
Price		
Contract Charges (NSL Figures)		

Figure 21: ✂

4.3.4 Cost Efficiency

Management of the approach is undertaken by NERL as a function of the London Approach service and as such the costs are not part of the TANS charge.

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NSL TANS Summary - LGW		
Driver and Component	LGW - 2015 (F Nominal) Data UNADJUSTED	LGW - 2015 (F Nominal) Data ADJUSTED
Efficiency		

Figure 22: ✂

✂

4.4 Manchester

4.4.1 Overview

NSL has been a long-term provider of the TANS function at Manchester. Its contract expires in March 2015. Initial stages of the process for the next contract will commence shortly and there is a possibility that the service requirements and forecast charges for RP2 may change as a result.

The NSL service currently operates with a dedicated resident NSL team at Manchester reporting to a Group Account Manager in NATS' Airport Service Line.

✂

4.4.2 Service Characteristics

The TANS services at Manchester have the following characteristics:

- Radar approach service provided from about 40 miles distance. NERL's Prestwick centre hand over at this distance.
- There are operational staff in the VCR (Visual Control Room) and the Radar Room on the ground floor
- 365/24 TANS coverage
- Two runways. Runway 2 open between 0630 -1030 and 1600 – 2000. This Summer 2013 a trial took place where runway 2 was additionally open between 1300 - 1600
- Access to Runway 2 requires Runway 1 to be crossed approximately at the half way point. Runway 2 is only 375m from runway 1 and thus only one runway operates at any time.
- Three terminals with one cul-de-sac. Access from the operational runway to Terminal 2 is restricted and requires significant ground movement control
- Landside location so easy access although the Tower is a 10-15 minute drive from the Central Terminal area
- Tower opened in 2013 and all equipment was new at that date. The old tower remains in-situ but not used apart from a legacy IT link to Bristol Airport.
- As the tower is new and landside, NATS staff are requested to host visits from organisations that are not stakeholders in TANS services
- Full approach and departure flight control
- Aircraft ground movement planning, 'delivery' from stand function and control
- Limited vehicle movement control
- AGL operation (aircraft wayfinding)
- High level of liaison with airport and airlines in joint efficiency improvement, safety cases etc
- 2D simulator and on-site training succession programme
- Full engineering repair and maintenance support via self-provision and contractors to ATC related assets

The control tower and accommodation (including facilities management) and ATC related assets together with utilities and business rates are provided free of charge by the airport and consequently there is no component in the NSL charge.

NSL TANS Summary - MAN		
Driver and Component		MAN - 2015 (F Nominal) Data
Demand	Airport IFR forecast (thousand IFR pa, source: STATFOR September forecast)	173,000
	IFR actual (CY2012, thousand IFR pa, source: STATFOR)	169,000
	Pax (mppa)	20
	Runways	2
	Busy Hour	64/46
	Busy Month	July
	Operational Day	24 hrs
	Night Coverage	Yes
	Change Orders/CAPEX impact	Risk fully borne by NATS for all people resource; CAPEX requires change order within the confines of current operational scope
	Spec	Bespoke service specification in line with airport operator requirements.
Service	Flight Control (Approach & Departure)	Yes
	Area Approach	Yes
	A/C Ground Movements	Yes
	Transport Ground Movements	Yes
	Stand & Movement Planning	Yes
	AGL Management	Yes
	MET Observation Services	Yes
	Runway crossings	Yes
	Others	Single and dual runway use
		Stakeholder liaison etc
		Aerodrome safeguarding
	Accommodation & Utilities provision	Free of Charge?
	Systems & Nav aids provision	Airport owned
	Engineering provision	Engineering maintenance
	Training Requirement	Yes airport bespoke
Simulator	2D	
Contingency Facility	Not bespoke	

Figure 23: MAN 2015 TANS function summary (source NSL)

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4.4.3 *Analysis*

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NSL TANS Summary - MAN		
Driver and Component	MAN - 2015 (F Nominal) Data UNADJUSTED	MAN - 2015 (F Nominal) Data ADJUSTED
Service Resourcing		
Price		
Contract Charges (NSL Figures)		

Figure 24: ✂

4.4.4 Cost Efficiency

Management of the approach at Manchester is undertaken by the Tower. Manchester is a two runway airport but the runways are not always used simultaneously.

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NSL TANS Summary - MAN		
Driver and Component	MAN - 2015 (F Nominal) Data UNADJUSTED	MAN - 2015 (F Nominal) Data ADJUSTED
Efficiency		
Efficiency		

Figure 25: ✂

✂

4.5 Stansted

4.5.1 Overview

NSL has been a long-term provider of the TANS function since 2001. Its contract expires in March 2018. The NSL service currently operates with a dedicated resident NSL team at Stansted reporting to a Group Account Manager in NATS' Airport Service Line.

Stansted is dominated by the low cost carrier business with Ryanair and Easyjet as its principal airlines. Both operate fleets of Code C aircraft. Movements at the airport have reduced by ca. 30% since the peak of 2007. Traffic is forecast to grow up to and during RP2 but movements are unlikely to return to the pre-recession peak of 208,000 ATMs during the period.

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4.5.2 Service Characteristics

The service at Stansted is dominated by Ryanair's airport based fleet (40+ overnight) and its use of the single long runway. Busy hour performance historically has been 50 ATMs (45 is normal busiest hour) with the operating day dominated by early morning, mid day and late evening departures and arrivals of Ryanair's European fleet. Business aviation and cargo aircraft also use Stansted with both often arriving overnight.

As with Heathrow, the Tower function at the airport excludes the London Approach service which is undertaken by NERL. The final approach and departure function at the Stansted Tower is characterized by the predominance of Code C aircraft. Similarly the airfield is well arranged with easy access to taxiways and stands with good levels of holding areas.

The peak hour traffic which is evident in every one of the three daily shifts will provide little opportunity for NSL to further moderate its service or resourcing.

The TANS function at Stansted is characterised by a number of aspects particular to the airport:

- No Approach service as provided by NERL
- 365/24 TANS coverage
- High proportion of Code C aircraft (less vortices)
- Single terminal with well organised taxiways and aprons
- Long runway and multiple paths facilitate easier maintenance and less disruption
- Generally pre-planned schedule and hence less tactical real-time management
- Final approach and departure flight control (little interference with LTN)
- Some aircraft ground movement planning and control. 'Delivery' from stand function is only necessary in high peaks.
- Limited vehicle movement control
- AGL operation (aircraft wayfinding) is a shared function by ATCO and GMC
- High level of liaison with Ryanair and Easyjet (25 min turnarounds) in joint efficiency improvement, safety cases etc
- NSL owns the Tower but pay STN for ground lease and utilities.
- ATC related assets owned by NSL/NERL.
- Back-up VCR in fire station
- 2D simulator and on-site training succession programme
- Full engineering repair and maintenance support via self-provision and contractors to ATC related assets

The control tower is owned by NSL and the cost (including facilities management) and ATC related assets are charged to the airport by NSL as a component of the TANS charge.

The following chart summarises key service data for the NSL contract at Stansted:

NSL TANS Summary - STN		
Driver and Component		STN - 2015 (F Nominal) Data
Demand	Airport IFR forecast (thousand IFR pa, source: STATFOR September forecast)	148,000
	IFR actual (CY2012, thousand IFR pa, source: STATFOR)	142,000
	Pax (mppa)	20
	Runways	1
	Busy Hour	50
	Busy Month	August
	Operational Day	24 hrs
	Night Coverage	Yes
	Change Orders/CAPEX impact	Risk fully borne by NATS for all people resource; CAPEX requires change order within the confines of current operational scope
	Spec	Bespoke service specification in line with airport operator requirements.
Service	Flight Control (Approach & Departure)	Yes
	Area Approach	No
	A/C Ground Movements	Yes
	Transport Ground Movements	Yes
	Stand & Movement Planning	Yes
	AGL Management	Yes
	MET Observation Services	Yes
	Runway crossings	Yes
	Others	
		Stakeholder liaison etc
		Aerodrome safeguarding
	Accommodation & Utilities provision	All NSL owned. Utilities levied by STN
	Systems & Nav aids provision	NSL owned or leased
	Engineering provision	Engineering maintenance
	Training Requirement	Yes airport bespoke
	Simulator	2D
Contingency Facility	Yes Partial	

Figure 26: STN 2015 TANS function summary (source NSL)

The TANS contract includes a range of financial adjustments which can be applied by the airport should various aspects of the service be deficient. These are calculated using various IFR punctualities, environmental and overall performance considerations and if fully levied would represent \times of the annual TANS charge.

4.5.3 Analysis

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There is no appreciable adjustment to the TANS service expected during the RP2 period and the airport and the TANS function both have the opportunity to handle increased traffic especially in non-peak periods which would provide economy in the TANS charge per IFR movement.

NSL TANS Summary - STN		
Driver and Component	STN - 2015 (F Nominal) Data UNADJUSTED	STN - 2015 (F Nominal) Data ADJUSTED
Service Resourcing		
Price		
Contract Charges (NSL Figures)		

Figure 27: ✂

4.5.4 Cost Efficiency

Management of the approach is undertaken by NERL as a function of the London Approach service and as such the costs are not part of the TANS charge.

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NSL TANS Summary - STN		
Driver and Component	STN - 2015 (F Nominal) Data UNADJUSTED	STN - 2015 (F Nominal) Data ADJUSTED
Efficiency		
Efficiency		

Figure 28: ✂

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4.6 Tier 1 Benchmarking

4.6.1 UK Comparison

The following graphic indicates the comparative demand at each of the Tier 1 airports and the respective TANS charge in 2015. It also indicates the resulting charge should the estimated revenue, received by NERL, for the London Approach and an allowance in lieu of asset charging are included.

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Figure 29: ✂

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Figure 30: ✂

The opportunity to benchmark the Tier 1 TANS service to other airports in the UK and Ireland is limited with only Dublin as a potential comparator (East Midlands having relatively low volume but commercially sensitive due to self-provision and Birmingham under tender). Dublin has a relatively low demand with IFR movements in 2015 forecast to be ca.156,000 p.a. in this respect it is only comparable to Stansted given that the other three airports are, especially in the cases of Heathrow and Gatwick, considerably larger.

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Figure 31: ✂

4.6.2 EC Comparison

The total TANS charge and the charge per IFR movement in Sterling equivalent at Heathrow are both high in comparison to the large European airports.

The volumes at the remaining UK Tier 1 airports tend to be less than the European airports used as comparators (only Dublin is comparable as the larger European airports are similar to Heathrow) and

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Figure 32: ✂

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On both an unadjusted and an adjusted charge (allowing for London Approach revenue and accommodation) basis the impact of volume, as shown by orange markers in Figure 33 below, is initially considered to be significant indicating the high charge per IFR movement at the lower volume Tier 1 airports in the UK and at Dublin. However the situation is potentially less clear when these lower volume Tier 1 airports are compared to the high volume airports in Europe (with the exception of Paris) where volumes are significantly greater but where the charge does not significantly benefit from economies of scale.

For example, from the following graphic,

✂

Charles de Gaulle airport in Paris is the exception to this comparison given its very low published TANS charge for 2015¹⁸ which appears to benefit greatly from its economy of scale but also may reflect a standardised airports wide cost component within the French TANS charging system.

¹⁸ France RP2 RT – TNC 2013_JUN_01062013



Figure 33: ✂

The larger number of runways generally at the European airports will require more resources but this does not potentially explain the parity in charge per movement with so great a volume differential. Excepting the low TANS charge per movement at Paris,



Figure 34: ✂

5. Review of Tier 2 >65,000 IFR movements

5.1 Overview

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Figure 35: ✂

The Tier 2 airports are only dissimilar to those in Tier 1 by demand with forecast volumes in 2015 less than 145,000 IFR movements. All three are relatively similar in demand being somewhat larger than the 65,000 movements set by the CAA.

The Tier 2 airports all operate with a requirement for a three shift day and also have a mix of services with some including their own Approach function and, in the case of Luton, one that is covered by NERL's London Approach service.

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Figure 36: ✂

The comparison, together with further consideration to the impact of the omission of the approach function at Luton, is undertaken further in the sections that follow.

5.2 Luton

5.2.1 Overview

NSL has been the provider of the TANS function since 2001 and renewed its current contract in 2012 following a competitive tender process. Its contract expires in October 2015. The dedicated resident NSL team based at Luton reports to a Group Account Manager in NATS' Airport Service business.

✂

5.2.2 Service Characteristics

The TANS provision at Luton has the following characteristics:

- Approach services as provided by NERL as part of London Approach and not included within NSL's TANS charge.
- 365/24 TANS coverage
- High proportion of Code C aircraft
- Single terminal
- Airfield is challenging with short runway, back-tracking, lack of taxiways, limited apron and holding space and a one-way circuit to and from stands. Business jets (represent 27% of movements and increasing) and access to aircraft maintenance areas also via one-way circuit. Now a level 3 co-ordinated airport.
- Short runway and limited aircraft paths result in disruptive maintenance
- Easyjet overnight 30+ aircraft resulting in peak periods in each shift with morning departures coinciding with arrivals from Eastern Europe.
- Generally pre-planned schedule and hence less tactical real-time management
- Final approach and departure flight control. Little interference from STN but Northolt is disruptive on DEP.
- Some aircraft ground movement planning and control. 'Delivery' from stand function is only necessary in high peaks.
- Limited vehicle movement control
- AGL operation (aircraft wayfinding) is a shared function by ATCO and GMC
- High level of liaison with Easyjet and Ryanair (25 min turnarounds) in joint efficiency improvement, safety cases etc
- Tower and ATC related assets owned by the airport and provided free of charge consequently no recovery in NSL charge.
- No back-up VCR
- No simulator or on-site training and limited succession programme relying on NSL wide training provisions
- Full engineering repair and maintenance support via self-provision and contractors to ATC related assets

The control tower and accommodation (including facilities management) together with utilities and business rates are provided free of charge by the airport.

NSL TANS Summary - LTN		
Driver and Component		LTN - 2015 (F Nominal) Data
Demand	Airport IFR forecast (thousand IFR pa, source: STATFOR September forecast)	104,000
	IFR actual (CY2012, thousand IFR pa, source: STATFOR)	98,000
	Pax (mppa)	11
	Runways	1
	Busy Hour	34
	Busy Month	August
	Operational Day	24 hrs
	Night Coverage	Yes
	Change Orders/CAPEX impact	No risk to NATS on current people resource however CAPEX requires change order within the confines of current operational scope
	Spec	Bespoke service specification in line with airport operator requirements.
Service	Flight Control (Approach & Departure)	Yes
	Area Approach	No
	A/C Ground Movements	Yes
	Transport Ground Movements	Yes
	Stand & Movement Planning	Yes
	AGL Management	Yes
	MET Observation Services	Yes
	Runway crossings	Yes
	Others	Complex Airfield with back track and limited exits, congested stands, integrated maintenance and bizjets and push back blockage
		Stakeholder liaison etc
		Aerodrome safeguarding
	Accommodation & Utilities provision	Free of Charge
	Systems & Nav aids provision	Airport owned
	Engineering provision	Engineering maintenance
	Training Requirement	Limited
Simulator	2D	
Contingency Facility	No	

Figure 37: LTN 2015 TANS function summary (source NSL)

The TANS contract includes a financial adjustment provision should overall performance be deficient and if fully levied would represent \times of the annual TANS charge.

5.2.3 *Analysis*

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NSL TANS Summary - LTN		
Driver and Component	LTN - 2015 (F Nominal) Data UNADJUSTED	LTN - 2015 (F Nominal) Data ADJUSTED
Service Resourcing		
Price		
Contract Charges (NSL Figures)		

Figure 38: ✂

5.2.4 Cost Efficiency

Management of the approach is undertaken by NERL as a function of the London Approach service and as such the costs are not part of the TANS charge.

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NSL TANS Summary - LTN		
Driver and Component	LTN - 2015 (F Nominal) Data UNADJUSTED	LTN - 2015 (F Nominal) Data ADJUSTED
Efficiency		
Efficiency		

Figure 39: ✂

✂

5.3 Edinburgh

5.3.1 Overview

NSL has been a long-term provider of the TANS function at Edinburgh. Its contract expires in March 2018. The dedicated resident NSL team at Edinburgh reports to a Group Account Manager in NATS' Airport Services business.

✂

5.3.2 Service Characteristics

The TANS provision at Edinburgh has the following characteristics:

- Radar approach service provided from about 40 miles distance. Prestwick centre hand over at this distance.
- There are operational staff in the VCR (Visual Control Room) and the Radar Room on the ground floor
- 365/24 TANS coverage
- Two runways but Runway 2 only used when Runway 1 is closed for maintenance. Thus single runway operation
- One terminal and no cul-de-sacs as terminal is linear
- Landside location so easy access
- Tower opened in 2007 and all equipment was new at that date
- The tower is part of EAL's brand and thus NATS staff are requested to host visits from organisations that are not stakeholders in TANS services
- The Tower utilises five radar feeds (two at Edinburgh, Glasgow, Prestwick and Kincardine (which was financed by a grant from Scottish Power)
- Stand allocation by EAL
- Full approach and departure flight control
- Aircraft ground movement planning and control
- Limited vehicle movement control
- AGL operation (aircraft wayfinding)
- 2D simulator and on-site training succession programme
- Full engineering repair and maintenance support via self-provision and contractors to ATC related assets

The control tower and accommodation (including facilities management) together with utilities and business rates are provided and charged to NSL by the airport. NSL in turn recharges the same to the airport within its TANS charge.

NSL also includes a charge for the provision of ATC related assets which in turn it sources via a range of leasing contracts.

The TANS contract includes a range of financial adjustments which can be applied by the airport should various aspects of the service be deficient. These are calculated using various IFR punctualities, environmental and overall performance considerations and if fully levied would represent ✂ of the annual TANS charge.

NSL TANS Summary - EDI		
Driver and Component		EDI - 2015 (F Nominal) Data
Demand	Airport IFR forecast (thousand IFR pa, source: STATFOR September forecast)	111,000
	IFR actual (CY2012, thousand IFR pa, source: STATFOR)	109,000
	Pax (mppa)	10
	Runways	1
	Busy Hour	40
	Busy Month	July
	Operational Day	24hrs
	Night Coverage	Yes
	Change Orders/CAPEX impact	Risk fully borne by NATS for all people resource; CAPEX requires change order within the confines of current operational scope
	Spec	Bespoke service specification in line with airport operator requirements.
Service	Flight Control (Approach & Departure)	Yes
	Area Approach	Yes
	A/C Ground Movements	Yes
	Transport Ground Movements	Yes
	Stand & Movement Planning	Yes
	AGL Management	Yes
	MET Observation Services	Yes
	Runway crossings	Yes
	Others	
		Stakeholder liaison etc
		Aerodrome safeguarding
	Accommodation & Utilities provision	By airport charge-levied
	Systems & Nav aids provision	NSL owned or leased
	Engineering provision	Engineering maintenance
	Training Requirement	Yes airport bespoke
	Simulator	2D
Contingency Facility	Yes Partial	

Figure 40: EDI 2015 TANS function summary (source NSL)

5.3.3 Analysis



NSL TANS Summary - EDI	
Driver and Component	EDI - 2015 (F Nominal) Data
Service Resourcing	
Price	
Contract Charges (NSL Figures)	

Figure 41: ✂



5.3.4 Cost Efficiency

✂

NSL TANS Summary - EDI	
Driver and Component	EDI - 2015 (F Nominal) Data
Efficiency	
Efficiency	

Figure 42: ✂

5.4 Glasgow

5.4.1 Overview

NSL has been the long-term provider of the TANS function at Glasgow. Its contract expires in March 2018. The dedicated resident NSL team reports to a Group Account Manager in NATS' Airport Services business.

✂

5.4.2 Service Characteristics

The TANS services at Glasgow have the following characteristics:

- Radar approach service provided from about 40 miles distance. Prestwick centre hand over at this distance.
- There are operational staff in the VCR (Visual Control Room) and the Radar Room on the ground floor
- 365/24 TANS coverage
- Single runway operation
- Two terminals with two cul-de-sacs. Restrictions caused by the cul-de-sacs are only a problem during the morning and evening peaks.
- Airside location so access is restricted. Photo passes required from the GLA Pass office even for temporary visits. NATS employ a driver who spends a considerable amount of time transporting visitors to and from the Tower and Pass Office
- The tower was constructed in 1966. It remains functional as a building
- Stand allocation by GLA
- Full approach and departure flight control
- Aircraft ground movement planning and control
- Limited vehicle movement control
- AGL operation (aircraft wayfinding)
- 2D simulator and on-site training succession programme
- Full engineering repair and maintenance support via self-provision and contractors to ATC related assets

The control tower and accommodation (including facilities management) together with utilities and business rates are provided and charged to the airport by NSL.

NSL also includes a charge for the provision of ATC related assets which in turn it sources via a range of leasing contracts.

The TANS contract includes a range of financial adjustments which can be applied by the airport should various aspects of the service be deficient. These are calculated using various IFR punctualities, environmental and overall performance considerations and if fully levied would represent ✂ of the annual TANS charge.

NSL TANS Summary - GLA		
Driver and Component		GLA - 2015 (F Nominal) Data
Demand	Airport IFR forecast (thousand IFR pa, source: STATFOR September forecast)	79,000
	IFR actual (CY2012, thousand IFR pa, source: STATFOR)	78,000
	Pax (mppa)	7
	Runways	1
	Busy Hour	34
	Busy Month	July
	Operational Day	24hrs
	Night Coverage	Yes
	Change Orders/CAPEX impact	Risk fully borne by NATS for all people resource; CAPEX requires change order within the confines of current operational scope
	Spec	Bespoke service specification in line with airport operator requirements.
Service	Flight Control (Approach & Departure)	Yes
	Area Approach	yes
	A/C Ground Movements	yes
	Transport Ground Movements	yes
	Stand & Movement Planning	yes
	AGL Management	yes
	MET Observation Services	yes
	Runway crossings	yes
	Others	
		Stakeholder liaison etc
		Aerodrome safeguarding
	Accommodation & Utilities provision	By airport charge-levied
	Systems & Nav aids provision	NSL owned or leased
	Engineering provision	Engineering maintenance
	Training Requirement	Yes airport bespoke
Simulator	2D	
Contingency Facility	Yes Partial	

Figure 43: GLA 2015 TANS function summary (source NSL)

5.4.3 Analysis



NSL TANS Summary - GLA	
Driver and Component	GLA - 2015 (F Nominal) Data
Service Resourcing	
Price	
Contract Charges (NSL Figures)	

Figure 44: ✂



5.4.4 Cost Efficiency

Glasgow Tower operates as a complete service including the Approach function.

NSL TANS Summary - GLA	
Driver and Component	GLA - 2015 (F Nominal) Data
Efficiency	
Efficiency	



Figure 45: ✂

5.5 Tier 2 Benchmarking

5.5.1 UK Comparison

The three airports considered in this section are the only three airports in the UK with IFR movements in excess of 65,000 p.a. that operate on a daily three shift basis. As stated previously Birmingham, which also operates on a three shift basis, is excluded from this study. Whilst London City meets the 65,000 criterion it does so on a 6 day week with night time closure making it unsuitable for comparison. By way of reference Dublin with its 156,000 IFRs is shown on the following graphic albeit its demand is approximately 50% greater than that at Edinburgh and Luton.

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Whilst the Approach revenue and the asset adjustment would in part explain the variance in charge across the airports,

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Figure 46: ✂

5.5.2 EU Comparison



Figure 47: ✂

There is a noticeable correlation in the following graphic when the contract charge (red markers) and charge per IFR movement (blue bars) are mapped with a consistency apparent across the airports.



Figure 48: ✂



Figure 49: ✂



Figure 50: ✂

6. Conclusions

6.1 Generally

The information provided by NSL in the preparation of this study, both current and forecast for 2015, has generally proven consistent with the current information received through the meetings with NSL's manager at each airport. Whilst we have been provided with copies of the relevant contracts, we have taken all the figures issued by NSL at face value and have not sought to verify the client requirements or forecast charges with the clients involved. No financial auditing exercises have taken place being beyond the scope of this commission.

Despite the commonality of provider and the adoption of a three shift 24 hour operating day at each of the seven airports visited, it is apparent that there remains a wide variation in both requirement and delivery which is evident in the data collected. Services are primarily influenced by the inclusion or otherwise of the Approach function and by way of adjustment this review has sought to facilitate the comparison. The provision of assets whether the tower itself or the ATC related assets varies at each airport with costs not always contained within the TANS charge, again this review has sought to adjust such charges to ease the comparison. Importantly physical and operational complexity varies from airport to airport. In certain circumstances there is relatively low-utilisation of the service given the reduction in IFR movements since their peak in 2007.

NSL has been supportive at all levels in the provision of data for this study. It has been able to provide financial data by airport and cost heading but was unable in the timescales to provide financial information supporting its charge on a cost head basis. It does not, at present, summarise its costs or charges by ATC function.

The functions forming the TANS are:

- Air Traffic Management
- Communication
- Navigation
- Surveillance
- Search and rescue
- Aeronautical Information
- Meteorological services
- Supervision costs
- Other State costs

The provision of such a cost breakdown would be beneficial in the future allowing comparison with charges in Europe.

Whilst the information obtained for the UK airports has been sufficient to facilitate the comparative adjustments, it remains an extrapolation of costs and estimates and should not be taken as a substitute for a full review of London Approach and asset charges. The comparative charges for European TANS is similarly unsupported without a detailed assessment of scope of service or detailed charging methodologies and it should be noted that no verification visits have been undertaken for this review.

NSL has confirmed that the charge head "Cost of Capital" covers its charges in respect of return on its investment/cost of capital as well as allowances against service and financial risk as well as a profit contribution to NATS (and corporation tax liabilities).

It is assumed that European TANS providers have adopted the same approach but Capita has not been able to verify this in detail. The state owned nature of European ANSPs may mean that the approach to pension and cost of capital costs in particular may not be comparable. Similarly forecast charges are liable to change¹⁹.

NSL was unable to split profit from its homogenous financial and performance risk allowances which vary with each contract. Airport operators have in the main requested fixed fee contracts with the majority having a form of service incentivisation, so performance risk rests with NSL.

✂

The true contribution to the NSL business is more complicated than these basic proportions given the mixed ownership and leasing of assets.

✂

There is no transparency regarding the forecast of indirect costs, overhead costs and other direct costs in the breakdown of charges. These are recognised as an annual calculation and will adjust given the size and support requirement from each contract annually.

6.2 Dependencies & Planning

NSL devotes a considerable amount of time on non-TANS provision activities such as:

- Tower visits for airport operators and their stakeholders
- Meetings with the airport operator regarding future initiatives
- Local PR
- Educating flying clubs regarding air space infringements
- NATS working group attendance

Senior NATS staff at the airports (e.g. General Managers, Ops and Training Managers) estimated that as much as 20% of their time could be spent on such activities. This is especially true where the towers are either new and/or landside. Whilst such activities are understandable and needed, it would be of assistance to all should such activities be specified with the appropriate charge clearly identified.

6.3 Trends

It is apparent that there is an increasing liberalisation of the TANS market in the UK with airports having either recently prepared or let tenders, or increasingly likely to do so in RP2.

✂

With self-provision, shorter contract terms, novation of assets to the client and a potential shift in the reimbursement methodology NSL faces considerable challenges going into RP2. The release of information by both airport and provider is currently commercially sensitive and will become more so.

Our analysis is based on current RP2 submitted figures by NATS.

¹⁹ ENAV/Italian Government Ministries have reduced TANS prices by 25% for one year to support the local economy (<http://www.canso.org/cms/showpage.aspx?id=5142>).

6.4 Benchmarking

There is limited opportunity to benchmark both the Tier 1 and Tier 2 airports in this study with others of comparative size or complexity in the UK other than Dublin as Birmingham has been excluded, as a result of tender action, and London City has a very different operating day and week. All other UK airports are significantly smaller in annual IFR movements. A more representative benchmark has been undertaken against both a selection of Tier 1 and Tier 2 airports in Europe. In detailed financial terms the charges forecast for these European airports are not as comprehensively supported as the corresponding data available for those in the UK which adds a corresponding challenge to the accuracy of the benchmarking.

Staff costs, and the under-pinning salaries paid by NSL at each airport, generally reflect the value of the annual TANS charge which in turn reflects the complexity of the airport. ✂

This can be seen in the following graphic:



Figure 51: ✂

There is a consistency in NSL resourcing. It is possible to approximate the resourcing through mapping to IFR movements at airports which operate the 3 shift full day and night system where all the UK airports considered tend to follow resourcing which mirrors the annual IFR volumes curve as indicated in the following graphic where the significantly larger demand and complexity of service at Heathrow indicates the exponential type increase in resourcing to provide the necessary support and resilience.



Figure 52: ✂

The TANS charge is very sensitive to IFR traffic volume given the commonality of the 24 hour operating day at each airport with the average unadjusted charge across all 18 airports considered at

✂

Conversely charges at Charles de Gaulle are at the lower end of charging in comparison with its peers at an unadjusted charge of ca. £54 per IFR movement. In itself this variation indicates the challenge in international benchmarking where the resulting charges vary in excess of that anticipated given the common levels of service and working practices across the industry.



Figure 53: ✂

6.5 Summary

It is apparent that the TANS charge is very sensitive to volume changes when expressed on a per IFR movement basis. The reduction in demand at all but the most constrained airports since the peak in demand in 2007 has resulted in a degree of under utilisation evident in this study (shift resourcing determined by shift peak traffic). It also demonstrates the inherent issues regarding flexibility in service response at airports where a three shift and an inconsistent demand profile day, results in a relatively inflexible resource provision. To a certain degree ATCO multi-skilling is apparent and helps to mitigate this within the Towers at the smaller airports but this remains a challenge given the safety critical nature of the function.

From the review of NSL charging data in the UK and its comparison, albeit in general terms, with the European sample of airports it is apparent that charges are generally higher reflecting the recharging of assets costs and the complexity and concentration of the London system. The service resilience requirement coupled in many cases with a slow pace of traffic recovery post 2007 results in potentially higher TANS charges per IFR movement than the service would otherwise deliver with greater throughput of traffic. ✂

There is a possible profile contained in Figure 53 which would suggest, subject to complexity adjustments and a number of notable airport exceptions,

✂

The increasing liberalisation of the UK market with an increasing propensity to either self-provide or competitively tender the TANS provision in parallel with a future growth in traffic handled within the current levels of charging will potentially, during the RP2 period, serve to moderate the TANS charge per IFR movement at many of the UK airports. ✂

The potential liberalisation, and in part the growth, will place increasing financial pressure on NSL as the incumbent provider at many of the UK's airports.

With planned tender action due at many airports in the UK during RP2 and with some likelihood for significant increases in demand towards the end of RP2 the expectation must be for TANS charges per IFR movement to be more economic than those forecasts at this time at many of the UK airports considered in this study.

Appendix A – Example Meeting Minutes

A.1 Meeting of 15th October - LHR

	Minutes 15 Oct 2013	NSL Tower – Cost Efficiency Benchmarking Heathrow House – 10.30 – 12.00 and LHR Control Tower 13.00 – 15.00	
	Present	✂	
		✂	
	Apologies	✂	
	FINAL VERSION		Action
	Heathrow House		
1.	The purpose of the introductory meeting was for the two teams to meet each other, for NSL to provide a high level overview of its relevant airport ATC operations, and for an initial discussion on the methodology for the NSL Tower Cost Efficiency Benchmarking study.		
2.	<p>Project Scope</p> <p>a) This is a 4 week study with completion 11 November 2013. This is a high level study and was not undertaken previously.</p> <p>b) The scope of the study is summarised in CAA Regulatory Policy Group – Ref 1778 (service Order 16) and may be summarised as advice on the cost efficiency of NSL towers with over 70,000IFRs per year for input into the consultation process and includes</p> <p style="padding-left: 20px;">b.1. Benchmarking between the NSL towers (Heathrow, Gatwick, Manchester, Stansted, Luton, Edinburgh and Glasgow); Birmingham is currently excluded from this study.</p> <p style="padding-left: 20px;">b.2. Benchmarking against other tower services within the UK and Ireland;</p> <p style="padding-left: 20px;">b.3. Benchmarking against a set of European tower operations.</p> <p>c) The period of benchmarking is RP2 namely 2015 – 2019</p> <p>d) The CAA have issued</p> <p style="padding-left: 20px;">d.1. EU Regulation 390/2013</p>		Capita

	<p>d.2. EU Regulation 391/2013</p> <p>d.3. CAP 1004 Single European Sky – Market Conditions for Terminal Air Navigation Services in UK</p> <p>d.4. The CAA will issue additional documents on costs as available.</p> <p>e) Capita were referred to NSL for additional information and this is addressed elsewhere in these minutes</p> <p>f) As part of the study there will be visit to the ATC towers are each of the seven airports. Capita will issue a schedule of visits, which will be agreed with NSL</p> <p>g) [Post Meeting Note, clarification from CAA – <i>“That is the study would include both parts of aerodrome control, aircraft take off and landing and ground movement control. The study should also include approach control as shown in the diagram. That is approach control provided from the ATC unit (i.e. Edinburgh, Glasgow and Manchester), but not where it is provided by NERL (i.e. Heathrow, Gatwick, Stansted or Luton”).</i>]</p>	
	<p>Management</p> <p>h) From the viewpoint of managing the study the main points of contact are, Rod Gander CAA, Tim Johnson NSL, and John O’Gorman Capita.</p> <p>i) All draft reports will be issued to CAA. The CAA will consult NSL on the draft report as appropriate.</p> <p>j) A confidentiality agreement – non disclosure agreement has been signed by Capita as part of the Regulatory Framework. This was further discussed and confirmed with the CAA pre appointment.</p> <p>k) The programme of work is as follows:</p> <p>k.1. Initial 2 weeks data collection and majority of site visits</p> <p>k.2. Confirm scope with CAA</p> <p>k.3. Completion of draft report 11 November 2013</p> <p>k.4. Following comments from CAA – completion of report.</p> <p>l) NSL will set up a NATS Share-file site for document control and issue</p> <p>m) Capita’s initial thoughts on report format are as follows:</p> <p>m.1. Introduction</p> <p>m.2. Context - high level view of the key issues and constraints and financial plans</p> <p>m.3. Cost efficiency analysis and benchmarking</p> <p>m.4. Conclusion</p>	
<p>3.</p>	<p>NSL issued two documents, namely a brief introductory presentation to the UK TANS market and supplementary financial information previously (confidentially) supplied to the CAA in compliance with SES regulation. In support of this material, NSL made the following points:</p>	<p>NSL</p>

	<ul style="list-style-type: none"> • The nature of the airports within the portfolio varies considerably, from a large international hub airport (Heathrow) to smaller point to point airports (eg Glasgow). • The top priority for all airport customers is the safety of their airport ATC services. Thereafter, the airport customers' priorities vary considerably. Heathrow, for example, is scheduled to around 99% of maximum available capacity and therefore even minor adverse weather conditions can have a major impact on punctuality. In this case, the airport's priority is improving resilience and adherence to the schedule. For some other airport operators, which are less capacity constrained, the emphasis of the airport operator is more on the cost efficiency of its TANS services. • The main factors conditioning the performance of the airport – principally the ground infrastructure and schedule - are controlled by the airport operator and not the TANS provider. • Scope of services provided under each TANS contract can vary considerably. Some of the main variations include: complexity of the airport operations, which in turn drives the requirement for ground movement controllers; treatment of approach control (it is excluded for all the main London airports since NERL provides this service); and treatment of assets and property costs. • NSL's operational resourcing requirement is governed by the legal SRATCOH rules (set by the CAA) and its Working Practice Agreement (agreed with the NATS Trade Unions) • The treatment of ATC assets in particular varies considerably across the contract portfolio. Unlike in many other European countries where the TANS provider owns the relevant assets, in the UK the majority of the TANS assets are owned by the airport operator or a leasing company • NSL's TANS contracts are generally fixed price in nature and do not have significant volume risk associated with them. This is because within certain parameters, the level of resource and therefore the level of cost associated with delivering different levels of ATC capacity do not change significantly (eg within certain parameters, an increase in movements on a single runway may likely to require the same level of resource, and conversely a reduction in movements may not reduce the level of resource required to deliver the service). • Some of NSL's contracts are output performance based, others (eg Luton) specify the level of input resource that NSL must provide to deliver the operation • The SES regulations presume a return on capital asset model applies to all ANSPs. Airport operators or leasing companies own the majority of TANS assets and therefore this return model is not appropriate for the UK TANS 	
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	<p>market. NSL’s methodology for completing these is set out in the accompanying explanatory note.</p> <ul style="list-style-type: none"> • NSL’s business is not managed on the basis of the “detail by service” classification contained in the SES return, and therefore its financial systems do not produce information in this way. Accordingly, NSL has not provided the information in this way on the SES returns. • NATS is not aware that any comprehensive and robust TANS benchmarking study has been completed either at a UK or European level. The SES RP2 financial returns are, in NSL’s view, probably the best single source of information to inform benchmarking. The annual Eurocontrol ACE benchmarking study contains some useful information at an aggregated level. However, there are significant comparability issues due to differing service scope, airport complexity and business and charging models. • In light of the above challenges, NSL felt that the timescales for the study were particularly challenging. <p>Electronic copies of the financial information and explanatory note will be provided to Capita.</p>	
4.	In the following discussion, the following additional points were made.	
5.	En Route control, provided by NERL typically manages the aircraft up to about 60 miles from the airport. The Approach control function typically manages aircraft from about 60 miles from the airport to within about 10 miles. Tower/aerodrome control manages aircraft within about 10 miles from the airport and their movement on the ground. The precise handover points between the different types of control vary between airport and can change within operational circumstances.	
6.	NSL described the sources of European TANS benchmarking data it was aware of and also described some of the challenges and limitations of this information. In its view, Germany was probably the closest relevant benchmark as the German ANSP (DFS) was established on a more commercial basis than many other European ANSPs and therefore had more similarities to NATS. However, other European ANSPs may have some relevance to benchmarking..	Capita
7.	For Heathrow and Gatwick, the main airport requirement is resilience of their operations and the schedule. For other airports, the requirements of the TANS provider vary on a case by case basis.	
8.	The service at LHR includes tower/aerodrome ATC, ground movement including operating the airfield ground lighting operating panel, Heathrow Operational Efficiency Cell, provision of a contingency facility for the tower operations, training (including provision of a 360 simulator capability), analytical support to the airport led scheduling process, management, first/second maintenance of ATC equipment	NSL

	owned by Heathrow or a leasing company and rental charges on property owned by Heathrow airport. A fuller scope of services will be provided through the Capita data request.	
9.	At LHR the contract is related to a level of service. Some of the other contracts are based on number of ATC personnel.	
10.	Customers generally have wanted fixed price contracts that do not contain significant volume risk but with the price risk lying with NATS.	
11.	The nature of the ATC operation means that while the winter and summer schedule can differ in terms of airport movements, the level resource NSL requires to deliver these different schedules does not vary significantly unless there is a very significant change in demand or airfield infrastructure.	
12.	ATCOs require considerable training before they can legally provide ATC services at any individual unit. Even if an ATCO is valid at one unit, they would need to undergo considerable re-training to enable them to become valid to provide control services at a different airport. Because of this, and the relatively stable levels of demand for ATCO resources throughout the year, there is relatively little movement of ATCOs between airports.	
13.	NATS own few assets at the airports. Tend to be supplied through financial leases. Property assets tend to be owned by the airports and either given to NATS as free issue or a rental is charged.	
14.	Capita will produce standard table for services at the airports. Some services may not be required at every airport.	Capita
15.	The 10 cm radar is part of the tower function as are all equipment on the runway and taxiway systems. The 23 cm radar is part of NERL and has been relocated from LHR.	
16.	Stand allocation is an airport operator function and is not provided by NSL.	
17.	As part of Capita's data request, NSL was asked to provide numbers of operatives and type of operations will be confirmed for each of the seven airports under consideration.	NSL
18.	Wherever possible, NSL allocates direct overheads to individual contracts. There are some indivisible corporate overheads that are allocated to contracts centrally.	
19.	Key KPI's are safety, delivering capacity, environment and resilience	
LHR ATC Tower Visit		
20.	The purpose of this introductory meeting was to provide a brief overview of the NSL Heathrow Tower operation. A presentation of the service was given and a copy will be uploaded to the share file. The following comments were made in relation to the presentation and services	NSL

21.	As the airport is at full capacity the main driver is to meet demand (c99% of maximum capacity is scheduled). The runways operate in segregated mode, with some arrivals permitted on the departure runway in certain limited circumstances (at certain times of the day if delays rise above a certain threshold, known as TEAM (Tactically Enhanced Arrival Model)). Mixed mode operations have been ruled out by Government policy. It is being considered by the Davies commission, but Heathrow feels that its real benefit does not outweigh the cost in particular the cost to community relations (2 arrivals streams all day). From an ATC prospective it would take significant airspace and infrastructure work to make it effective.	
22.	Different airline carriers have different protocols for operating aircraft (eg conditional landing clearances, rolling take offs) This adds complexity to the system.	
23.	T4 crossing occurs between larger vortex gaps.	
24.	Front line support (level 1-2) for the airport ATC equipment (including the 10cm radar, ILS, localiser, EFPS, ASMGCS systems) is included in the Heathrow ATC contract and is provided by a NSL Engineering Team based in the Tower. Level 3/4 maintenance and facilities management is outsourced.	
25.	The airfield ground lighting infrastructure at Heathrow is owned and managed by the airport operator. NSL operates the airfield ground lighting panel located in the tower.	
26.	The 23 cm radar is owned by NERL and has recently been relocated from LHR. It is not relevant to the Heathrow Airport ATC operation.	
27.	All ATCOs start with basic level (known as ab-initio) training before moving on to unit specific training. At a complex airport, this requires considerable time in the airport specific training simulator and on the job training. Once this is complete, an ATCO would be licenced to provide control services without supervision. End of end, this training process could take up to 2/3 years. The NATS training college is owned by NERL. NSL buys a pre-agreed number of trainee ATCOs from NERL each year that have successfully completed their ab-initio training.	
28.	Staff rostering, number and type based on 3 shift/5 watch system will be issued. Total number of staff will also be provided as part of the follow up Capita data request.	NSL
29.	Control over aircraft within the BA maintenance area is not provided by NSL. NSL takes control of the aircraft once it crosses the East Church Road onto the aerodrome.	
30.	The Heathrow tower does not have full eyesight visibility of all stands in normal weather conditions, nor of any stands during low visibility procedures. Dedicated systems (such as the ASMGCS) are used in both these circumstances to allow ATCOs to safely move aircraft.	
31.	Some changes and upgrades to the ATC tower systems and IT etc. will be required	

	when T2 goes live.	
32.	Complexity of the operation and maintaining resilience on the system to achieve the 480k ATM is prime concern. For example while the A380 can use both runways the taxiways on the northern part of the airfield able to take this aircraft are very limited, different runway threshold configurations at runway ends, position and number of RETS, A380 in T4 and runway crossings etc.	
33.	On Westerly operations, the runways used for arrivals/departures is alternated at 3pm. On Easterly operations there is no alternation pattern. The direction of take offs and landings is determined by the wind conditions, with a preference for Westerly operations when the component wind is less the 5 knots blowing to the West.	
34.	The A380 causes significant operational complexity for the ATC operation: slow to line up; slow to depart; large vortexes and the tail fin (24m high) interferes with the radar and therefore the aircraft cannot access certain parts of the airfield. The A380 can operate on the Northern runway, but taxiways able to take this aircraft are very limited on the Northern half of the airfield. Currently there are 16 A 380 flights per day but this is forecast to rise significantly over the next 10 years.	
35.	Daily record is 1389 movements. Daily average is 1350 movements indicating that the airport is operating at almost full capacity (c.99%).	
36.	Typical staffing pattern includes: one supervisor; 2 Tower ATCOs (one for each of the runways); 3 ground movement ATCOs; 1 ground movement planner (ATCO); 3 lighting panel operators and 1 support staff supporting met services.	
37.	Three shifts and a total number of circa 60 staff on duty per day. 0700-1430 1430-2200 2200-0700 Some staff “bridge” the shifts Fewer staff on duty during the night. Full staff numbers to be provided as part of the Capita data request.	NSL

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