

13 May 2010

## TERMINAL CONTROL SOUTHWEST (TCSW) AIRSPACE CHANGE REVIEW

### 1. Introduction

1.1 The Terminal Control South West (TCSW) Airspace Change was introduced on the 16<sup>th</sup> April 2008. This report details the outcome of a review of the effectiveness of the implementation and is based on data provided, obtained over an extended period due to the economic downturn, commencing 12 months following its introduction.

### 2. Background

2.1 Under the terms of its operating licence for en-route operations, NATS is required by the Civil Aviation Authority (CAA) to provide a safe and expeditious air traffic service under strict economic regulation. The titled proposal was put forward by NATS, and involved close coordination and cooperation with the Ministry of Defence (MoD). The proposal represented two new extensions of controlled airspace to the pre-existing route structure and was designed to address the complexity of conflicting flows of air traffic through the Compton and Woodley areas during periods of peak traffic demand, thereby delivering greater airspace efficiency and to address traffic operating into Southampton and Bournemouth airports from the north at certain times of the day.

### 3. Key Objectives

3.1 The TCSW development was undertaken by NATS, to facilitate the introduction of segregated north/south traffic flows for aircraft arriving to, and departing from, Bournemouth and Southampton airports. The design was an enhancement of the extant airspace route structure and in particular, was introduced to enable the introduction of a systemised<sup>1</sup> traffic flow.

3.2 The airspace design proposed was developed using forecasts of air traffic growth up to 2015 (10 years ahead at the time of the analyses). NATS does not attempt to forecast traffic more than ten years in the future. Beyond 10 years the reduced confidence in the accuracy of forecast traffic levels makes such predictions of little value, and at worst can be misleading<sup>2</sup>. It is anticipated that the airspace changes should accommodate the forecast growth in the TCSW region of airspace until at least circa 2012.

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<sup>1</sup> Process of organising air traffic flows into manageable streams, such that the frequency of conflicts between streams is minimised

<sup>2</sup> Some stakeholders have commented that they are more accustomed to working with 30 year forecast timescales for transport infrastructure plans. However it is relatively easy to change the position of airways (compared with changing the location of roads and railways), and the nature of air traffic demand is more volatile than other forms of transport, hence it has been found that 10 years is the maximum period practical for forecasting growth.

3.3 At the time the TCSW change was proposed, the current financial downturn could not have been predicted and, consequently, this had not been factored into the NATS traffic forecasts.



**Figure 1. Airspace structure after implementation**

3.4 The redesign and revised arrangements to the airspace are shown above, and were limited to air traffic services (ATS) routes below FL195 (19,500ft)<sup>3</sup>, and were based on a need to deal with increasing delays resulting from

<sup>3</sup> For the purposes of this document, all reference to Flight Level (FL) should be interpreted as referring to an equivalent value in thousands of feet; eg FL195 equates to approximately 19,500 feet

capacity limitations caused by the complex route structure in the TCSW Departures Sector. The two new extensions, one permanent and one based on Flexible Use of Airspace (FUA)<sup>4</sup> concept, were designed and introduced to improve overall airspace efficiency, both within and adjacent to the Solent Control Area, and to the airspace surrounding Woodley and Compton at periods of peak demand.

#### **4. Civil Air Traffic Management Requirements**

- 4.1 The TCSW Departures form part of the traffic handled by London Terminal Control (LTC) and take place adjacent to the London Terminal Manoeuvring Area (LTMA). From September 2005 to September 2006 the TCSW en-route Sectors<sup>5</sup> incurred 15,647 minutes of delay, 77% of which was due to insufficient ATC capacity. In the following 12 months, this figure had risen to 18,663 minutes, 86% of which was due to ATC capacity constraints. The proposed introduction of two new volumes of airspace, as an extension to the existing route structure, were designed to provide separate unidirectional tracks to allow lateral separation that would reduce complexity and controller workload and thereby permit an increased flow of traffic thorough the affected area.
- 4.2 Traffic figures at that time indicated that the reduction in flight delay should produce aggregated net benefits of £67.83M<sup>6</sup> in Present Value terms from the date of introduction up to 2015. Benefits would be obtained through improved efficiency of the available airspace and by the use of airspace sharing arrangements and enhanced FUA.

#### **5. Military ATM Requirements**

- 5.1 Although this proposal was not a Joint Future Airspace Development Team project, NATS sought to accommodate both military and MoD Boscombe Down requirements in the 2 areas under consideration and representatives from these organisations were involved in the planning of the proposal. The MoD therefore supported the changes subject to satisfactory airspace sharing arrangements being implemented.

#### **6. Key Elements**

- 6.1 The key safety objective was to enable a reduction in the complexity of the ATC function in the region by segregating key traffic flows and minimising the interaction between crossing traffic.
- 6.2 The key efficiency objective was to reduce delays by increasing capacity. Prior to the airspace change being implemented, this region regularly attracted significant air traffic control attributable delays, which caused it to be included in the Operational Partnership Agreement (OPA) top 10 issues list for several years. Bournemouth and Southampton routings require significant interaction in the Compton (Newbury) area against London Terminal Manoeuvring Area departures and inbounds, which detract from efficiency due to the multitude of crossing tracks requiring frequent tactical

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<sup>4</sup> FUA concept is airspace that can be switched on and off to accommodate all stakeholders requirements

<sup>5</sup> A 'sector' is an ATC means of dividing up the workload managed by an ATC Unit into either lateral or vertical areas, called sectors

<sup>6</sup> This figure is based on the ground delay cost per minute contained in the Eurocontrol 'Standard Values' document, updated to 2006 values, which is £54.24.

interventions. The additional airspace was planned to provide significant airspace efficiency by increasing capacity and reducing delay.

- 6.3 There is no promulgated route located within the FUA airspace. It is used as a tactical vectoring area, which means that aircraft do not by default fly along a particular route within the FUA airspace; rather, the entirety of the airspace is available to be used by air traffic controllers to direct individual aircraft on the most expeditious and safe course using all of the available airspace. As the flights using the FUA airspace during the Controlled Operational Hours are directed on an individual basis rather than along a promulgated route and this tends to lead to a dispersal of the traffic throughout the FUA airspace. As such it is unlikely that an individual in one location within the airspace will see all (if any) of the few additional flights flying through the FUA airspace.

## 7. Areas of Contention

- 7.1 **Environmental.** In accordance with Government requirements, the NATS' license dictates that it must accommodate forecast traffic growth when considering any airspace development. Environmental Guidance to the CAA from the Secretary of State for Transport and the Cabinet Office Code of Practice on Consultation determines a requirement for widespread environmental consultation in two circumstances:
- Changes to airspace below 7,000 feet above ground level.
  - Where visual intrusion by aircraft above 7,000 feet may be a consideration in exceptional cases such as National Parks and Areas of Outstanding Natural Beauty (AONB).
- 7.2 The lowest altitude of any new airspace associated with the TCSW changes is 5,500 feet. NATS consulted with organisations with an interest in the environmental impact of these changes. To attend to the requirements of all environmental stakeholders, including those groups that felt they had not been given adequate time to respond, the CAA decided that an extension to the consultation period should be provided by NATS.
- 7.3 Post consultation, NATS produced a Stakeholder Consultation feedback document that identified the following concerns from numerous stakeholder bodies:
- Large aircraft flying at night and sleep disturbance.
  - General issues of tranquillity relative to the CPRE tranquillity mapping project.
  - Growth in flight numbers that will result in increased CO<sub>2</sub> emissions.
  - Aircraft cause visual intrusion and impact upon nature of enjoyment of AONBs and National Parks.
- 7.4 An independent Environmental Research and Consultancy Department report was produced that identified there could be a number of environmental impacts that would result from the new airspace arrangements. Although some environmental factors showed a negative impact, others showed a positive impact. Overall, it was determined that as the noise assessment predicted that noise levels would be unlikely to cause additional sleep

disturbance, due in the main to the restriction placed on the operating hours of the FUA airspace, it was reasonable to conclude that the emissions benefits outweighed the noise and tranquillity impacts, thereby resulting in an overall environmental benefit.

- 7.5 The New Forest National Park, Cotswolds Area of Outstanding Natural Beauty (AONB) and North Wessex Downs AONB lie beneath the new TCSW airspace (see below). This section details the analysis undertaken by NATS to determine what extent a change has occurred to the number of aircraft overflying these areas. This analysis has been conducted to produce data required to form part of the Post Implementation Review of the TCSW airspace change, in accordance with the process laid down in CAA publication CAP725, Airspace Change Process Guidance Document.



**Figure 2. New airspace interaction with AONBs and National Parks**

- 7.6 A statistical cluster analysis sampling technique was used to calculate results covering the periods 1<sup>st</sup> July – 31<sup>st</sup> December 2007 and 2008. For brevity, these periods have been subsequently referred to as 'Before' and 'After' samples.

- 7.7 The flight levels shown in the following graphs represent the mean (averaged) level of the aircraft whilst in the lateral limits of that area<sup>i</sup>.
- 7.8 **Cotswolds AONB.** With the introduction of the new airspace arrangements, a greater area of the Cotswolds AONB is over-flown at some levels.

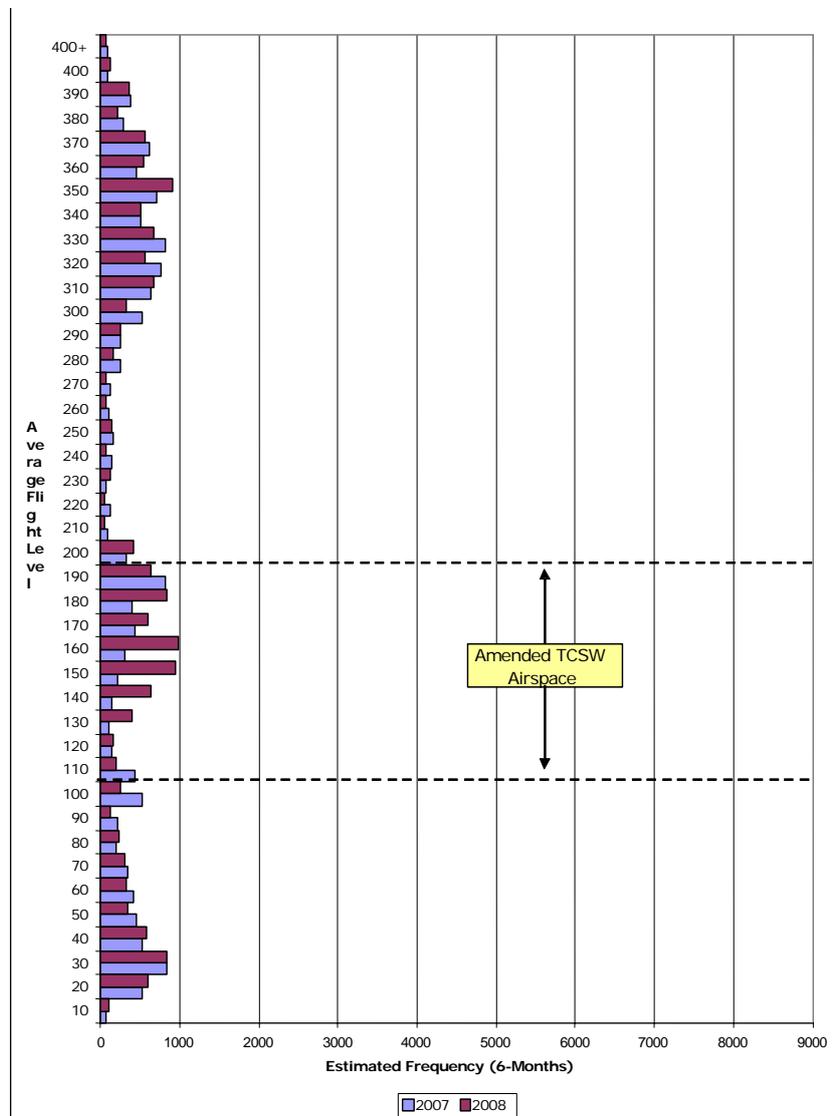


Figure 3. Distribution of aircraft Flight Level in the Cotswold region

- 7.9 The average altitudes of aircraft using the extended airspace above the Cotswold AONB are shown in Figure 3 above. The data shows that there has been an increase in the number of aircraft overflying between FL130 and FL180, in the new TCSW airspace, with the level band showing the largest increase between FL 50 and FL 160, where after the change was implemented an additional 720 movements were experienced over that 6-month period.
- 7.10 Overall, the new airspace arrangements have resulted in the numbers of aircraft overflying that portion of the Cotswold AONB increasing from approximately 17 to 30 flights per day between FL105 and FL195. However, at the lower levels, between FL105 and FL120, the numbers have decreased.

7.11 **North Wessex Downs AONB.** With the introduction of the new airspace arrangements, a greater area of the North Wessex Downs AONB is over-flown at some levels.

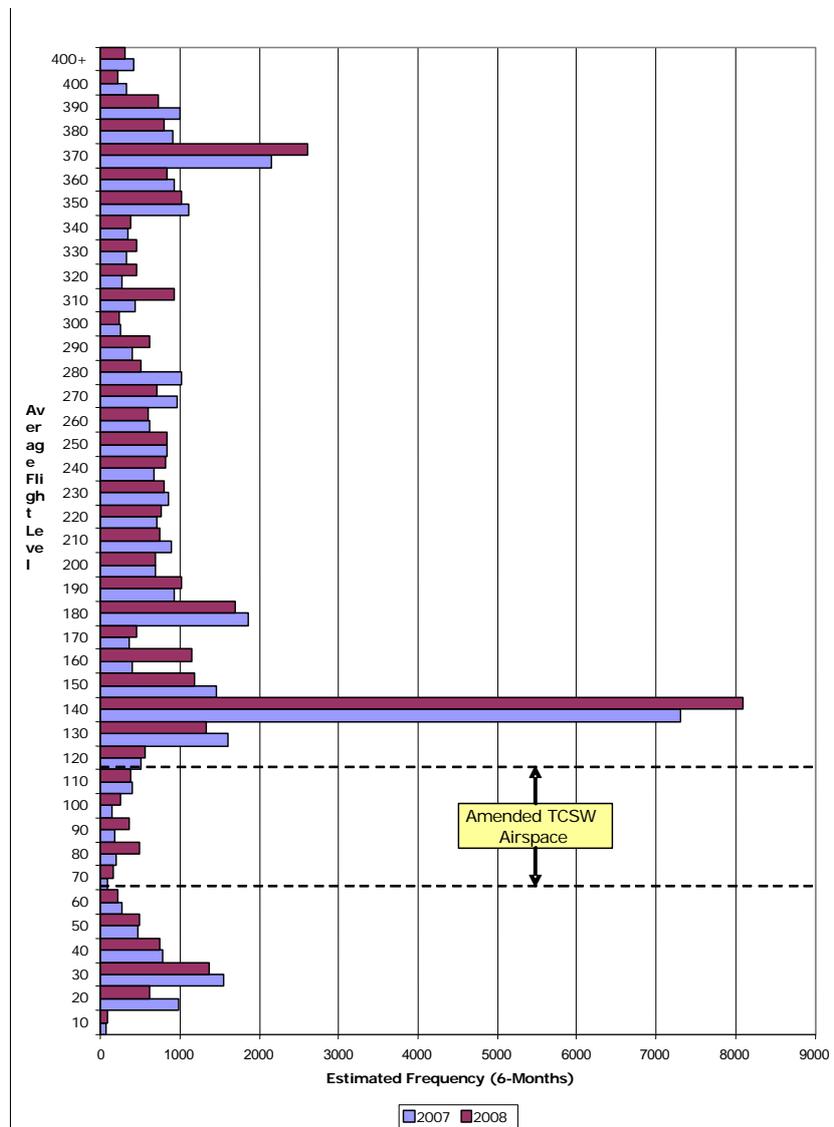


Figure 4. Distribution of aircraft Flight Level in the North Wessex Downs region

7.12 The average altitudes of aircraft using the extended airspace above the North Wessex Downs AONB are shown in Figure 4 above. The data shows that there has been an increase in the number of aircraft overflying between FL65 and FL105, in the new TCSW airspace.

7.13 Overall, the increase in the numbers of overflying aircraft in the new TCSW airspace has risen from approximately 6 per day before to 9 per day after.

7.14 **New Forest National Park.** With the introduction of the new airspace arrangements, a larger area of the New Forest National Park is over-flown at some levels.

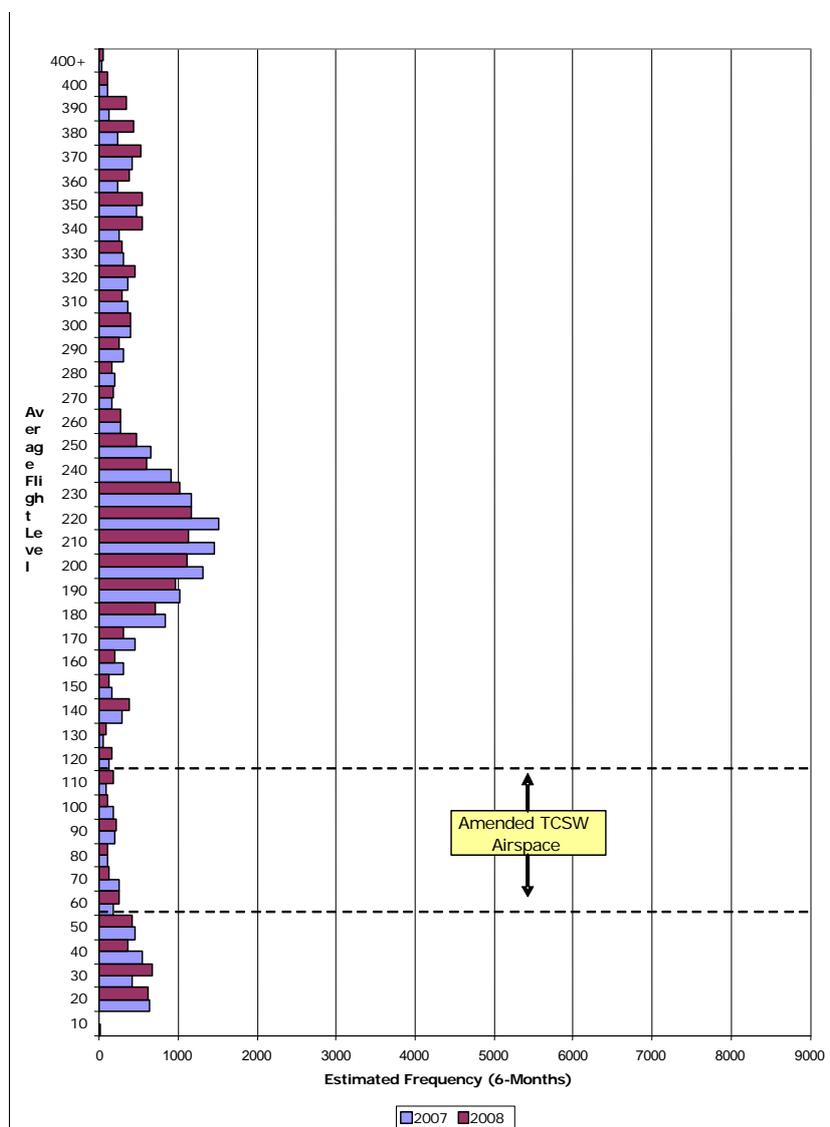


Figure 5. Distribution of aircraft Flight Level in the New Forest National Park region

7.15 The introduction of the new TCSW airspace parameters has had little impact on the number of aircraft overflying the New Forest National Park between FL65 and FL105. Figure 5 above shows that the traffic now overflying the national park has increased from an average of 5.57 flights per day before the change to 5.59 flights per day after the introduction of the new airspace arrangements. However, the figures also show that in airspace below the new airspace extension, the frequency of flights over the New Forest National Park has decreased slightly overall.

7.16 **Overflights Summary.** Whilst the introduction of the TCSW airspace change has resulted in the Cotswolds and North Wessex Downs AONBs and New Forest National Park experiencing an increase in numbers of over-flights, the actual increase for the New Forest National Park is very little at less than

0.5%. Table 1 below shows that the overall change in over-flights for the combined areas of AONBs and the New Forest National Park show an increase of 1.9% at all flight levels. The increase for the same combined areas at the TCSW flight levels is 59.2%.

		TCSW levels			All levels)	
		Total overflights	Average (Per day)	% Change	Total over flights	% Change
<b>Cotswolds AONB</b>	Before	3041	16.8		14,706	
	After	5411	29.9	77.9%	16,106	9.5%
<b>North Wessex Downs AONB</b>	Before	1012	5.6		35,754	
	After	1640	9.1	62.1%	36,732	2.7%
<b>New Forest National Park</b>	Before	1016	5.6		17,643	
	After	1021	5.6	0.5%	16,788	-4.8%
<b>Combined areas</b>				59.2%		1.9%

Table 1. Summary of Flights over AONBs and National Parks

**8 Environmental Conclusions.** This report has been prepared on the basis of analyses and other information provided by NATS. The main sources of information have been:

- Report 1 - TC-SW Post Implementation Review: Environmental Assessment
- Report 2 - NATS Additional Emissions Analysis for the TCSW Post-Implementation Review
- An analysis of post-implementation traffic within R41, contained within a letter sent by Lovells on behalf of NATS to Richard Buxton (Environmental Solicitors)

**8.1 Noise Analysis.** Little information on noise has been provided in either Report 1 or Report 2. If post-implementation profiles are as anticipated, it seems reasonable to assume that aircraft are flying no lower than was expected in the ACP. Fleet mixes have changed to some degree, but this reflects changes made by operators to their fleets for commercial reasons rather than an effect of the airspace change.

**8.2** In terms of the post-implementation usage of the new airspace, especially R41, NATS have referred to an analysis within an undated letter from Lovells to Richard Buxton. The conclusion of this analysis is that the introduction of the new airspace “has led to an additional 8 to 10 commercial flights per day in the R41 FUA during the R41 FUA Operational Hours”. However, this does not address the issue of whether or not these additional flights flew the anticipated improved profile – in fact, the analysis notes that “with respect to the R41 FUA in particular, over 25% of the flights were in the airspace for less than 20 seconds and over 50% were in the airspace for less than a minute”.

- 8.3 The numbers of additional flights noted above are in line with the numbers estimated in the ACP. This information, coupled with the information provided about profiles and fleet mix mean that it is reasonable to conclude that noise levels are likely to be in line with the anticipated noise impact in the ACP. However, it should be borne in mind that this conclusion is derived by considering information presented across the two Reports, plus other supporting documents rather than a specific post-implementation noise assessment undertaken by NATS.
- 8.4 **Emissions Methodology and Analysis.** The second assessment (Report 2) undertaken by NATS is consistent with the assessment for the ACP and so direct comparisons could be made, but it is only with the receipt of the latest information (received in April 2010) on usage of the A34 airspace by Southampton and Bournemouth arrivals from the north that some more robust conclusions can be made about the emissions impact.
- 8.5 Report 2 advises that the representative profiles for the four routes modelled in the ACP are also representative of the profiles for actual traffic following implementation, when they use the new airspace. On this basis, it would be fair to conclude that, on a flight-by-flight basis, flights affected by the airspace change should be achieving the CO<sub>2</sub> reductions that were estimated in the ACP.
- 8.6 To try and eliminate factors that are outside the influence of the airspace change, the information provided by NATS has been used to estimate the impact on annual CO<sub>2</sub> emissions but assumes that there have been no changes in post-implementation traffic volumes or fleet mix. In this way, a clearer picture emerges of the direct impact of the airspace change rather than factors such as the downturn in traffic or changes to more efficient aircraft. On this basis, three of the four effected profiles are achieving the expected benefits (Southampton arrivals, Bournemouth arrivals and Heathrow departures). However, it should be noted that the benefit achieved by the Heathrow departures is in part due to fewer than anticipated restricted climbs, which is not a benefit that can be attributed solely to the airspace change.
- 8.7 **Southampton Arrivals from the North.** The report indicates that almost 100% of the aircraft that were expected to use the new profile via A34 are in fact doing so.
- 8.8 **Bournemouth Arrivals from the North.** The report also indicates that almost 100% of the aircraft that were expected to use the improved “restricted” profile (i.e. via A34) are in fact doing so. However, because R41 FUA is used for tactical vectoring, it is difficult to determine what proportion of these arrivals is achieving the improved “unrestricted” profile (i.e. via A34 and R41). Whilst both of the new profiles offer a CO<sub>2</sub> reduction, the “unrestricted” profile offers a greater reduction. Therefore, the worst case is that all aircraft are flying the “restricted” profile, and the best case is that they are all flying the “unrestricted” profile. Due to the operational restrictions of R41 FUA, it is unlikely that all aircraft are achieving the “unrestricted” profile.
- 8.9 **Heathrow Departures via CPT.** The emissions benefit was to be achieved by those aircraft that were flying a restricted climb prior to the airspace change. Upon implementation, an improved (yet still restricted) climb would be possible which would achieve an emissions reduction. There was no anticipated change in the proportion of aircraft that would be using a restricted

climb – at the time of the ACP the proportion was 15%, and it was expected that this would be the same after implementation. However, the data provided for the PIR showed that just over 13% of aircraft were on restricted climbs prior to implementation, and only 10% following implementation. Based on this information, an annual emissions reduction is being achieved, but this will be in part due to less aircraft on restricted climbs (i.e. 10% rather than 15%) and therefore not entirely due to the improved restricted profile.

8.10 Whilst the fourth effected route (Luton departures) does show a reduction in CO<sub>2</sub> emissions, it is far less than was anticipated by the ACP. This is due to a significant difference in the actual proportion of flights that achieve restricted climbs when compared with the proportion expected in the ACP.

8.11 **Luton Departures via CPT.** In the ACP, the emissions benefit was to be achieved by reducing the proportion of aircraft on restricted climbs from 20% before implementation to 10% after implementation. However, the data provided for the PIR showed that only 2.2% of aircraft were on restricted climbs prior to implementation, and this fell to 1.5% after implementation. So, whilst there is an annual emissions benefit due to the reduced proportion of restricted climbs, it is much smaller than was anticipated in the ACP due to smaller change in the proportion (i.e. a change of 0.7% rather than the expected 10%).

## 9. General Aviation

9.1 The General Aviation (GA) community were consulted via NATMAC and their concerns were mainly based on the introduction of the FUA controlled airspace and their inability to obtain access to that airspace during hours of operation in the summer months, which is their peak period. However, since implementation of the new airspace, there have not been any complaints made or concerns raised by any members of the GA community with regard to the FUA arrangements.

## 10 Effectiveness of Change

10.1 **Safety – Incident Analysis.** When comparing information extracted from the NATS' STAR database from before and after the TCSW airspace change, for the period 10<sup>th</sup> April 2007 to 10<sup>th</sup> April 2009, the analysis of incident counts and rates (within the MOR Scheme<sup>7</sup> and all reported events) in the 12 months following the airspace change demonstrates that the reported incidents in the relevant Sectors have decreased; the total number of incidents in the specific control sectors attributed to this change was too low to give a meaningful comparison. However, the number of incidents in the LTC as a whole over the same time periods has increased by 5% (for MORs) and 9% (for all incidents). This indicates that the new TCSW airspace arrangements, by showing a decrease in incidents, have had no detrimental impact on safety.

10.2 **Analysis of Structural Risk of the Airspace Design.** There is no established method for quantifying the safety associated with an airspace structure, however, through analysis of radar data it is possible to measure the propensity for a given airspace structure to lead to aircraft being on converging trajectories. This measure can provide an indication of whether

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<sup>7</sup> MOR: Mandatory Occurrence Reporting Scheme contributes to the improvement of air safety by ensuring that relevant information on safety is reported, collected, stored, protected and disseminated.

an airspace design has achieved the aim of separating key flows and reducing conflict points; this measure is referred to herein as 'structural risk'. Analysing radar data to assess the likelihood of aircraft being on converging trajectories whilst in the revised TCSW airspace was undertaken to identify the "structural risk" of the airspace design. By comparing the new airspace structure with the old using this methodology it was found that with the new design, aircraft are less likely to be on converging trajectories.

10.3 **Capacity/Delay.** The airspace design was developed using forecasts of air traffic growth up to 2015. It was anticipated that the proposed changes should accommodate the forecast growth in the TCSW region of airspace until at least circa 2012. NATS use two methods to determine the capacity increase that the airspace change realised; these are:

- Investigating capacity change based on Monitor Values and throughput.
- Investigating capacity change based on relative throughput and delay.

10.4 **Monitor Values.** By comparing Monitor Values (MV)<sup>8</sup> before and after the changes for the TCSW Sectors, a basic assessment of the capacity change can be made. The figures in Table 2 highlight that the MV for TCSW post-implementation has increased across all Sectors and Sector arrangements, with an averaged increase of over 3.6%.

TCSW Sector Group (Sector)	Monitor Value (pre-change)	Monitor Value (post-change)	% Change
COWLY West	30	32	<b>+6.7</b>
COWLY Combined	55	56	<b>+1.8</b>
SW Deps	38	40	<b>+5.3</b>
OCK/SW Deps	45	46	<b>+2.2</b>
OCK/SW DEPs/WILLO	45	46	<b>+2.2</b>

Table 2. Monitor Values implemented as a result of the TCSW airspace change

10.5 **Throughput.** The combined total number of aircraft handled by the TCSW Sectors for the 6 months July-December 2007 was 337,113. After the airspace change had been implemented the total for the same July to December period for 2008 had risen to 339,435. This figure equates to an increase of 0.7% throughput of traffic for this group of sectors.

10.6 **Delay.** Table 3 shows the total delay per year generated as a result of capacity restrictions being imposed on the TCSW Sectors. The figures show that the overall level of delay for the TCSW Sectors post-implementation has reduced by 81%. This figure should be viewed in the context of an increased

<sup>8</sup> Monitor Values (MV) are used by Air Traffic Flow Managers, as a guideline, to regulate the numbers of aircraft a controller can expect to work in a given time period over and above which regulations are often imposed.

change in throughput of 0.7% through the TCSW Sectors. Post-implementation, whilst the National figures for aircraft movements has declined, the throughput in the TCSW Sectors has increased.

Sector	Delay (mins)		% Change
	2007	2008	
Cowly West	570	0	-100%
Cowly Combined	9081	1676	-82%
SW DEPS	8713	1864	-79%
OCK/SW DEPs	13310	1864	-86%
OCK/SW DEPs/WILLO	20285	4560	-78%
<b>Total</b>	51959	9964	<b>-81%</b>

Table 3. ATC Capacity En-route Delay generated by TCSW Sectors

10.7 **Capacity versus Delay Summary.** Tables 2 and 3 illustrate that as a result of the airspace development, the post-implementation capacity of the TCSW Sectors based on MV assessment, during a period where there has been a National decline in aircraft movements, has increased. This has enabled the TCSW Sectors to handle an increased throughput of traffic of 0.7%, while at the same time delays have reduced by 81%.

## 11 Other Benefits

11.1 **Flexible Use of Airspace.** Although the FUA working relationships between NATS, MoD and Boscombe Down were a new initiative for the TCSW airspace region, the airspace sharing arrangements have worked well and have lead to a more efficient use of airspace. This will enable more efficient working practises and is likely to have a positive impact on further reducing delays.

## 12 Operational Impact - Feedback from ATC Units

12.1 **NATS Swanwick LTC (John Henderson, TCSW ATCO).** The A34 extension and transfer of airspace from LAC Sector 23 to TCSW was a great benefit for TCSW, TC MIDS and TC North as it provides more airspace to the west of CPT. That said, a lower base overhead Brize Norton to mirror the FL85 base of N859 would have provided more benefit to TCSW.

12.2 The shape and dimensions of the FUA are very beneficial for TCSW, however the flexible use timings are still not something TC controllers have become accustomed to. Feedback has been that some controllers don't want to have to think about whether it's available or not so they do not use it. I personally, find it useful but the routes do not go through the FUA and therefore it can occasionally increase workload, as controllers need to pro-actively take arrivals off the STAR and vector into the airspace in order to utilise the FUA.

- 12.3 The R41 FUA airspace as permanent CAS would have provided greater benefits, but it is recognised that this would not have been acceptable to the MOD.
- 12.4 **MoD/Defence Aviation Air Traffic Management (Squadron Leader Mike Duffy: representing Military Stakeholders, including: RAF Brize Norton, RAF Boscombe Down).** I have spoken to the interested parties regarding the TCSW Implementation, and can confirm that the changes have had no adverse impact to our operations.
- 12.5 **Southampton Airport ATC (Roy Foderingham, ATC Watch Manager).** When the FUA is available, it is of great benefit to Solent. We particularly like to see EGGH traffic positioned into it as they are then not in the flow of Southampton arrivals when we are on RWY 20. When we are on RWY 02 it is useful for Southampton arrivals as it then gives us more space to position DWL RWY 02 as the VORDME final approach track is to the west of the centreline for RWY 02.
- 12.6 I feel there is a positive impact on safety due to the fact we don't have to climb and descend in close proximity to each other (e.g. 5nm apart), with one aircraft in the FUA segment and the other in R41. This in turn reduces our workload and probably would give us scope for more capacity.
- 12.7 **Bournemouth Airport ATC (Greg Fanos, Senior Air Traffic Controller).** The introduction of the FUA west of the SAM VOR had a minimal impact on our operations. Only northwest Departures and Arrivals (in our case Ryanair flights into and from Dublin) use the Airspace occasionally but due to the hours that the flights operate, they cannot always use it. I believe the introduction had more of an impact on the London Airports' operations rather than Bournemouth or Southampton.

### 13 Conclusion

- 13.1 The NATS justification behind the TCSW airspace change proposal was based on a need to increase capacity to help reduce delay and maintain safety. NATS had to also be cognisant of the environmental impact of the airspace change and to therefore mitigate the effect to ensure there was not an overall environmental detriment.
- 13.2 From an environmental perspective, although little information on noise was initially provided by NATS, it seems reasonable to assume that on the information that was eventually received, the increase in number of flights is in line with the estimated numbers and that it is reasonable to conclude that the noise levels are as anticipated. Looking at the emissions data received as part of NATS' second assessment (January 2010), the figures were consistent with the assessment for the ACP. However, it was not until we received further information (in April 2010) were we able to factor in the usage of the A34 airspace for Southampton and Bournemouth arrivals from the north. Overall, the Southampton, Bournemouth and Heathrow modelled profiles are achieving the expected benefits, whilst the Luton CPT departures, although showing an annual emissions benefit, is much smaller than was anticipated. It should be noted that the emissions savings at Heathrow can be attributed at least in part to a change in fleet operations to more efficient aircraft, as well as to circumstances credited to the TCSW airspace change.

- 13.3 Overflight of AONBs and the New Forest National Park show that there has been an increase of approx 13 aircraft per day overflying the Cotswold AONB above 10,500 feet in the new TCSW airspace. The figure for the North Wessex Downs AONB show that the number of aircraft overflying between 6,500 feet and 10,500 feet in the new TCSW airspace has increased by approximately 3 per day. However, in the FUA airspace during hours of operation, the number of aircraft overflying the New Forest National Park has not increased and remains at an average of between 5 and 6 per day.
- 13.4 Concerns and enquiries generated by environmental groups and members of the public in the run up to the airspace change have not been repeated since the implementation of the revised airspace arrangements. This could indicate that from a public perspective, there are no environmental issues existing at this time.
- 13.5 Although the increase in capacity has only been moderate, this has been in contradiction to National figures where the trend has shown a decline in traffic figures. However, this capacity increase has contributed appreciably to the significant reduction in delay and to the encouraging safety assessment analysis, whereby aircraft are now less likely to be on converging trajectories than they were before the changes were implemented.
- 13.6 From an operational stakeholder perspective, the feedback is encouraging. Controllers at the London Terminal Control Centre (LTC) and Southampton have benefited from the airspace change, whereas there has been little impact on Bournemouth operations. However, as there is no dedicated route in the FUA airspace, LTC controllers do not always use it as a tactical option. It is also confirmed that the airspace change has had no adverse impact on Military operations.
- 13.7 In sum, the TCSW airspace change is considered to have overall delivered significant benefits in the reduction of delay, by increasing capacity and not compromising safety levels in any way. There has been an overall reduction in CO<sub>2</sub> emissions, albeit minor.

*Original signed*

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<sup>i</sup> To create accurate representation of data, certain information displayed in Figures and Tables has been extracted from the NATS PIR.