CAA CAP 1616 Economic Assessment and Statement

Title of airspace change proposal	SAIP AD5
Change sponsor	NATS
Project no.	2017-77
SARG project leader	[redacted]
Case study commencement date	27 May 2019
Case study report as at	3 July 2019

To aid the Decision process the status column of each question has been highlighted accordingly to illustrate if it is:

Resolved | Partially Resolved | Not Resolved | Not Applicable

Guidance

*The broad principle of economic impact analysis is **proportionality**; is the level of analysis involved proportionate to the likely impact from that ACP? There are three broad levels of economic analysis; qualitative discussion, quantified through metrics, and monetised in £ terms. The more significant the impact, the greater should be the effort by sponsors to quantify and monetise the impact.*

1. Background – Identifying the Do Nothing (DN) /Do Minimum DM) and Do Something (DS) scenarios		
1.1	**Are the *outcomes of* DN/DM and DS scenarios clearly outlined in the proposal?** Yes, the sponsor clearly outlined DN/DM scenarios in the Step 4A Update and Submit section 8.2 – Design Options Assessment.	**YES**
Direct impact on air traffic control		**Status**
2.1	**Are there direct cost impact on air traffic control / management systems?** **If so, please provide below details of the factors considered and the level in which this has been analysed.**	**YES**

2.1.1	*Examples of costs considered (please add costs that have been discussed, and any reasonable costs that the tech reg feels have NOT been addressed)*	**Not applicable**	**Qualitative Assessment**	**Quantified**	**Monetised**
	Infrastructure changes	X			
	Deployment		X	X	N/A
	Day-to-day operational costs / workload / risks	X			
	Other (provide details)	X			
	Comments The sponsor provided the qualitative/quantitative assessment for deployment costs to ANSPs. It is stated that approximately 140 LAC/LTC controllers would require full training and training staff are required to run the simulator and some operational support staff may require briefings. It is also said that the reduced availability of operational controllers during their conversion training means that operational rostering becomes a factor when considering continuous service delivery. The sponsor informed ANSPs acceptance of this proposal is a high-priority design principle and the proposal cannot be introduced without their agreement. However, the sponsor couldn't quantify the training cost for ANSPs and it is assumed such costs are acceptable to these agencies.				
2.2	**Are there direct beneficial impact on air traffic control / management systems?** **If so, please provide details and how they have been addressed:**				**YES**
	Examples of benefits considered	**Not applicable**	**Qualitative Assessment**	**Quantified**	**Monetised**
	Reduced work-load		X		
	Reduced complexity / risk		X		
	Other (provide details)	X			
	Details: As outlined in the Safety Assessment of Stage 4A Update Design document, the proposed volumes of CAS would contain Birmingham arrivals and departures within CAS. The sponsor claimed that this is a more predictable air traffic environment during the hours of operation, and flights within CAS are safer than those outside CAS. It is further added this would cause a reduction in the complexity of the region's airspace for the same amount of traffic for both ATC and pilots. The change sponsor concluded that there would be less coordination and fewer tactical actions required, thus reducing the number of controller interactions and which would also result in a lower RT loading.				

	The flows proposed for Heathrow offload routes were designed by the sponsor to provide a more predictable method for the tactical balancing of flows by reducing the need for late tactical stack swaps. The sponsor said this would consequently reduce the operational complexity currently experienced within this region and hence, a decrease in coordination and controller interactions would reduce ATC complexity.	
2.3	**Where monetised, what is the net monetised impact on air traffic control (in net present value) over the project period?** ***£----*** N/A	
2.4	**Are the direct impacts on air traffic management analysed accurately and proportionately?**	**YES**
	Yes, the sponsor provided a proportionate analysis on the impact of the proposal and provided both qualitative and quantitative/monetised economic analysis on the most significant changes.	

3.	**Changes in air traffic movements / projections**				**Status**
3.1	**What is the impact of the ACP on the following and has it been addressed in the ACP proposal?**				**Yes**
		Not impacted / not applicable	**Qualitative Assessment**	**Quantified**	**Monetised**
3.1.1	Number of aircraft movements	N/A	N/A	N/A	N/A
3.1.2	Type of aircraft movement	X			
3.1.3	Distance travelled	X			
3.1.4	Area flown over / affected	X			
3.1.5	Other impacts		X		
3.1.6	**Details:** There is no forecast increase in air transport movements as an outcome of this proposal according to the change sponsor's final options appraisal. The sponsor provided the qualitative assessment for capacity and resilience that would affect the wider society with increased flight planning options that can allow aircraft operators to avoid capacity-constrained areas and avoid				

	consequential delay and cost. The sponsor stated in their Final Options Appraisal that the main change in impact to GA users would be from the volume of new proposed CAS base FL65, near to Birmingham. The sponsor explained that this would increase the area Birmingham radar can use for tactical vectoring, for their arrivals and departures but with a low impact on GA users with 94% of GA currently flying at FL65 or lower, in this region.				
3.2	**Has the forecasting of traffic done reasonably using best available guidance (e.g. DfT, Academic sources…etc?)**				**YES**
	Yes, the sponsor informed on Stage 4A Update and Design document that the airspace change for Birmingham arrivals and departures has been modelled using the fast-time simulation software AirTOp and annualised traffic figures are based on the 2017 NATS base case forecast. The sponsor further added fuel burn modelling has been undertaken using the KERMIT emissions model. However, the outcome of the model (the distance flight saving for each flight and the fuel burn per flight) has not been provided to the CAA. Therefore, from an economic perspective, the validation of the CO2e emissions -which is used as an input to WebTAG workbook- is not possible. At this stage, the CAA will not ask for the evidence from the sponsor as this is not a requirement in CAP1616. **Economist Note:** Just to flag the above issue for future references, it would be worth to provide the feedback to the sponsor after the decision stage to enable a process that would work better for future ACPs. From an economic perspective, it is crucial to cross check whether the methodology and sources used by the sponsor is in line with the Green Book and the DfT WebTAG. In order to adopt such robust process, CAP1616 should be amended accordingly, and for future ACPs sponsors should be asked to provide all relevant evidences that feed their analysis outcome.				
3.3	**What is the impact of the above changes on the following factors?**				
		Not impacted / not applicable	**Qualitative Assessment**	**Quantified**	**Monetised**
3.3.1	Noise	X	N/A	N/A	N/A
3.3.2	Fuel Burn		X	X	X

3.3.3	CO2 Emissions		X	X	X
3.3.4	Operational complexities for users of air space		X		
3.3.5	Number of air passengers / cargo	X	N/A	N/A	N/A
3.3.6	Flight time savings / Delays		X		
3.3.7	Other impacts	N/A	N/A	N/A	N/A
3.4	**Are the traffic forecast and the associate impact analysed proportionately and accurately according to available guidelines (e.g. WebTAG?)**				**YES**
	Yes, as the most significant impact is said to be net savings in fuel burn, the sponsor provided the quantitative/monetised economic assessment for savings in fuel burn and CO2e emissions. The sponsor stated that fuel burn modelling has been undertaken using the KERMIT emissions model. However, the outcome of the model and the methodology to calculate the fuel burn and CO2e emissions have not been provided to the CAA. So, as mentioned in Question 3.2, from an economic perspective the validation of the distance flight saving for each flight and the fuel burn per flight is not possible. At this stage, the CAA will not ask for the evidence from the sponsor as this is not a requirement in CAP1616. **Economist Note:** In line with the note above in Question 3.2, it would be worth to provide the feedback to the sponsor after the decision stage to enable a process that would work better for future ACPs. From an economic perspective, it is crucial to cross check whether the methodology and sources used by the sponsor is in line with the Green Book and the DfT WebTAG. In order to adopt such robust process, CAP1616 should be amended accordingly, and for future ACPs sponsors should be asked to provide all relevant evidences that feed their analysis outcome.				
3.5	**What is the total monetised impact of 3.3? (Provide details)**				**YES**
	The change sponsor provided the outcome of their internal analysis on the proposed changes which would result in a beneficial net saving in fuel burn of -1,806T in 2020, for the associated regions and in 2030, there would be an increased forecast fuel burn saving of -2,238T. The WebTAG analysis carried out by the sponsor for the proposed airspace change -which is a combination of the sponsor's				

preferred option (Option 1B), Heathrow Offload Routes and plus high-level ATS routes- shows that **the design would yield a positive Net Present Value of £601,249** which reflects a benefit in CO2e emissions reduction. According to the WebTAG analysis, there would be a reduction of CO2e emissions in the opening year 2020 of 4,353T and the total reduction would be 55,146T over a 60-year appraisal period.

The sponsor also provided their internal analysis for NPV of CO2e emissions for each proposed route as available in the below chart. According to the chart below, the proposed Heathrow offload route will result in a small increase of fuel usage and CO2e; however, this would constitute only 5% of the total reduction on CO2e emissions over 60-year appraisal period.

Traffic Flow	Net Present Value of CO_2 equivalent emissions of proposal (£) Traded Sector	Net Present Value of CO_2 equivalent emissions of proposal (£) Non-Traded Sector	Change in CO_2 equivalent emissions over 60 year appraisal period (T)	Change in CO_2 equivalent emissions in opening year (T)
Birmingham Arrivals and Departures	N/A	£188,926	-17,280	-1,479
Heathrow Offload Route	N/A	*-£28,873*	*2,641*	*226*
Q60 KOPUL - UGNUS	N/A	£265,660	-24,381	-1,889
Q60 MORAG – LANON - UGNUS	N/A	£37,699	-3,463	-261
P155 MORAG – FACTU - HON	N/A	£137,837	-12,663	-951
Total	**N/A**	**£601,249**	**-55,146**	**-4,353**

4.	Benefits of ACP				Status
4.1	**Does the ACP impact refer to the following groups and how they are impacted by the ACP?**				**YES**
		Not impacted / Not applicable	**Qualitative Assessment**	**Quantified**	**Monetised**
4.1.1	Air Passengers	X	N/A	N/A	N/A
4.1.2	Air Cargo Users	X	N/A	N/A	N/A
4.1.3	General aviation users		X		
4.1.4	Airlines		X		
4.1.5	Airports		X		
4.1.6	Local communities	X	N/A	N/A	N/A
4.1.7	Wider Public / Economy		X	X	X
4.1.8	**Detail:** The change sponsor referred to the above groups and indicated whether they would be affected from the proposed routes on the Final Options Appraisal that was embedded to Stage 4A Update Design document. Communities are said to be not affected by the proposed routes because changes to commercial air traffic patterns are all above 7,000ft. So, the sponsor concluded the potential noise impacts caused by a small number of non-commercial GA-type flights, descending to FL65 at certain times under certain conditions, is neither measurable nor describable and this is same for air quality as there wouldn't be any change below 1,000ft. The statements are in line with CAP1616. Please see the answer provided to Question 4.2.6 for the details of the potential impacts of the proposed change on GA users, airlines and airports.				
4.2	**How are the above groups impacted by the ACP, especially (but not exclusively) looking at the following factors:**				

		Not impacted / not applicable	Qualitative Assessment	Quantified	Monetised
4.2.1	Improved journey time for customers of air travel		X		
4.2.2	Increase choice of frequency and destinations from airport	X	N/A	N/A	N/A
4.2.3	Reduced price due to additional competition because of new capacity	X	N/A	N/A	N/A
4.2.4	Wider economic benefits		X	X	X
4.2.5	Other impacts	X			
4.2.6	**Details:** The Sponsor said increased flight planning options can allow aircraft operators to avoid capacity-constrained areas and as forecast traffic levels grow, the ability to avoid restrictions by utilising alternative flight plan routes would reduce the likelihood of delays, thus improving the resilience of the wider route network. The sponsor suggested the proposed changes would result in a beneficial net saving in fuel burn for associated regions. WebTAG was used to assess the greenhouse gas impact over the appraisal year period (60 years) from the proposed change implementation date of 2020. According to the WebTAG assessment result, this design option would yield a positive Net Present Value which reflects a benefit that is CO2e emissions reduction. Please see Question 3.5 above for the quantified/monetised figures related to fuel burn and CO2e emissions.				

4.3 **What is the overall monetised impacts associated with 4.1 and 4.2 the above?**

Traffic Flow	Net Present Value of CO_2 equivalent emissions of proposal (£) Traded Sector	Net Present Value of CO_2 equivalent emissions of proposal (£) Non-Traded Sector	Change in CO_2 equivalent emissions over 60 year appraisal period (T)	Change in CO_2 equivalent emissions in opening year (T)
Birmingham Arrivals and Departures	N/A	£188,926	-17,280	-1,479
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Total	**N/A**	**£601,249**	**-55,146**	**-4,353**

4.4 **What are the non-monetised but quantified impacts of the above?**

The change sponsor provided their forecast on the savings in fuel burn that is quantified to reach the reduction in CO2e emissions. The sponsor claimed the proposed changes would result in a beneficial net saving in fuel burn of -1,806T in 2020, for the associated regions and further added there would be an increased forecast fuel burn saving of -2,238T for 2030.

The sponsor further provided that the impact assessment indicates that c.124,000 flights would be impacted by the change by 2020, rising to c.148,000 by 2030.

4.5 **What are the qualitative / strategic impacts described above?**

Please see the answer to Question 4.2.6.

4.6 **What is the overall monetised benefits-costs ratio (BCR) of the policy? Is it more than 1?**

The CAA calculated the overall monetised benefits-costs ratio of the policy by using the net present value assumptions of the change sponsor and the outcome is more than 1 (BCR=21.82).

4.7 **Have the sponsors provided reasonable justification for the proportionality of analysis above?** **YES**

4.8	**If the BCR is less than 1, are the quantitative and qualitative strategic impacts proportional to the costs of the ACP?**	**NO**
5	**Other aspects**	
5.1	N/A	

6	**Summary of Assessment of Economic Impacts & Conclusions**
6.1	The change sponsor completed the Full options appraisal in accordance with CAP1616 process. The sponsor adopted a proportionate and accurate approach during Final options appraisal by taking into account the significant impacts of the proposed airspace development. The Final appraisal consists of the Full appraisal with the refinements and changes made as a result of the Stage 3 formal consultation with stakeholders as pointed out in CAP1616. WebTAG was used to assess the greenhouse gas impact for the combined over the appraisal year period (60 years) from the proposed change implementation date of 2020. According to the WebTAG assessment result, this design option would yield a positive Net Present Value which reflects a benefit that is CO2e emissions reduction. The change sponsor assessed all reasonable costs and benefits qualitatively and valued all relevant costs and benefits of the airspace change and justified the reasons why costs and benefits have not been quantified where necessary.

Outstanding issues?		
Serial	Issue	Action required
1		
2		

Economic assessment and statement sign-off and approval	Position	Name	Signature	Date
Economic assessment and statement completed by:	[redacted]	[redacted]	[redacted]	03.07.2019
Economic assessment and statement approved by:	[redacted]	[redacted]	[redacted]	02.08.2019