

CAA CAP 1616 Options Appraisal Assessment (Full)

Title of airspace change proposal		Bournemouth Airport RNAV Approaches	
Change sponsor		[REDACTED]	
Project no.		ACP 2018-40	
<i>Case study commencement date</i>	20/11/2019	<i>Case study report as at</i>	29/11/2019

Account Manager: [REDACTED]	[Grey]	Engage & Consult: [REDACTED]	[Yellow]	IFP: [REDACTED]	[Orange]	OGC: [REDACTED]	[Dark Blue]
Tech Regulator: [REDACTED]	[Green]	Environmental: [REDACTED]	[Purple]	Economist: [REDACTED]	[Light Blue]	ATM: [REDACTED]	[Red]

Instructions: To aid the SARG project leader’s efficient project management, please highlight the “status” cell for each question using one of the four colours to illustrate if it is:

Resolved - GREEN
Not Resolved – AMBER
Not Compliant – RED
Not Applicable - GREY

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.*

Please refer to the Initial Options Appraisal Assessment associated with this ACP, and published on the Airspace Change portal, for input to date.

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?		<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
1.1.1	Has the change sponsor produced an Options Appraisal (Phase II - Full) which sets out how Initial appraisal is developed into a more detailed quantitative assessment, moving from qualitatively defined shortlist options to the selected preferred option? [E23]	The Sponsor provided the Full Options Appraisal which provides a detailed quantified analysis on noise and fuel burn/CO2 impact for RNP IAP sub options. The sponsor also filled in the WebTAG workbook for noise and greenhouse gases impact for all sub options of RNP IAP that is Option 3. Qualitative assessment is also developed in line with CAP 1616.	<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
1.1.2	Does each shortlist option include the impacts in comparison to the 'do nothing/minimum' option, in particular: -all reasonable costs and benefits quantified -all other costs and benefits described qualitatively -reasons why costs and benefits have not been quantified	Yes, the shortlisted options which are 3c and 3d are appraised qualitatively for each design criteria and environmental impacts are appraised quantitatively for all reasonable costs and benefits. The Sponsor provided the justification regarding why it wasn't possible or proportionate for them to quantify/monetise the impacts where necessary.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
1.1.3	Where options have been discounted, does the change sponsor clearly set out why?	The Sponsor provided the reason why Option 3a and Option 3b were discounted because they do not meet with safety criteria.	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
1.1.4	Has the change sponsor indicated their preferred option in the Options Appraisal (Phase 2 - Full)? [E23]	Yes, the preferred option is indicated as Option 3d due to a better noise and fuel performance compared to other viable option which is Option 3c.	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
1.1.5	Does the Full Options Appraisal (Phase 2 - Full) detail what evidence the change sponsor will collect, and how, to fill in any evidence gaps and how this will be used to develop the Options Appraisal (Phase III - Final)? Does the plan for evidence gathering cover all reasonable impacts of the change?	The Sponsor provided the evidence on their raw data and methodology adopted to produce the output of WebTAG for noise and greenhouse gases. They also provided the 10-year traffic forecast which supported their methodology for the opening and forecast year figures.	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

2. Direct impact on air traffic control					Status
2.1	Are there direct cost impacts 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.				
2.1.1	<i>Examples of costs considered (please add costs that have been discussed, and any reasonable costs that the tech reg feels have NOT been addressed)</i>	Not applicable	Qualitative	Quantified	Monetised
2.1.2	Infrastructure changes		X		
2.1.3	Deployment		X		
2.1.4	Day-to-day operational costs / workload / risks		X		
2.1.5	Other (provide details)	X			
2.1.6	Comments The Sponsor stated the only costs associated with Option 3c and 3d are as follows without providing any quantitative estimate due to commercially sensitive information: <ul style="list-style-type: none"> •IAP design, •Validation (flight and ground), •Safety assessment, •Airspace change and consultation, •Certification and •Training •Publication in AIP. It is also mentioned the costs of ownership of the straight-in RNP approach supported by GNSS is very low compared to a conventional approach which requires the provision of ground navigation aid infrastructure. In addition, the sponsor stated there would be maintenance of the approach procedure on a five yearly basis but no quantitative estimate is provided due to commercial sensitivity.				

2.2	Are there direct beneficial impacts on air traffic control / management systems?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	If so, please provide details and how they have been addressed:			
2.2.1	<i>Examples of benefits considered</i>	Not applicable	Qualitative	Quantified	Monetised
2.2.2	Reduced work-load	X			
2.2.3	Reduced complexity / risk	X			
2.2.4	Other (provide details)	X			
2.2.5	Details	N/A			
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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The Sponsor stated in the Full Options Appraisal that no quantitative estimate was provided because operational and deployment/infrastructure related costs were commercially sensitive. However, according to CAP 1616, change sponsors should take a pragmatic approach to valuing the various costs and benefits which may mean the use of ranges rather than precise figures. So, this is highlighted by the CAA for sponsor's reconsideration should they want to add more informative quantified detail on the costs associated with RNP approach implementation.				

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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Not impacted / Not applicable	Qualitative	Quantified	Monetised
3.1.1	Number of aircraft movements	X			
3.1.2	Type of aircraft movement		X		
3.1.3	Distance travelled		X		

3.1.4	Area flown over / affected					
3.1.5	Other impacts	X				
3.1.6	<p>Details</p> <p>The Sponsor stated the provision of RNP approaches would provide capacity and resilience benefits. However, no quantitative assessment is made of the increase in the capacity as a result of the RNP approach compared to the ILS.</p> <p>For Option 3c, the sponsor stated that the aircraft would join the procedure by self-positioning with the initial approach segment, with less predictable route there won't be a benefit of distance reduction and therefore they haven't conducted a quantified or monetised analysis for Option 3c.</p> <p>In terms of the preferred Option 3d, it is stated there would be a small proportion of arriving commercial aircraft benefiting from the change of distance reduction during out of the hours operations and therefore the sponsor carried out the quantified and monetised analysis for this option to appraise the savings in the volume of CO2, fuel burn and carbon emissions.</p>					
3.2	<p>Has the forecasting of traffic done reasonably using best available guidance (e.g. DfT WebTAG, the Green Book, Academic sources...etc?)</p> <p>The Sponsor provided the 17-year traffic forecast as an evidence on their calculations for CO2 emissions. They have used their internal assumption and provided the forecast of total number of arrivals during out of operations for the period 2018-2035 as they stated there would be a small proportion of arriving commercial aircraft benefiting from the change to distance reduction.</p>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	<p>What is the impact of the above changes on the following factors?</p> <p>Of the 11 areas considered to be impacted by this ACP which represents an increase back to 2008 traffic levels and has been modelled as such, only 3 areas were considered to be impacted adversely in terms of noise, the Leq Noise contour exercise completed showed that the proposal would slightly extend the Leq Contours to the East of the airport, the same was true for both the daytime (16hr) and night time 8 hr contours both of which were produced for the purposes of the acp. Emissions assessment was carried out for this acp using the FAA AEDT tool. The results obtained were then also entered into WebTAG as per the requirement of CAP1616. Qualitatively the results of the assessments undertaken indicated that emissions would be maintained or reduced slightly as a result of this change.</p>					
		Not impacted / Not applicable	Qualitative	Quantified	Monetised	
3.3.1	Noise			X		

3.3.2	Fuel Burn		X	X	X
3.3.3	CO2 Emissions		X	X	X
3.3.4	Operational complexities for users of airspace	X			
3.3.5	Number of air passengers / cargo	X			
3.3.6	Flight time savings / Delays	X			
3.3.7	Air Quality	X			
3.3.8	Tranquillity		X		
3.4	<p>Are the traffic forecast and the associate impact analysed proportionately and accurately according to available guidelines (e.g. WebTAG or the Green Book?)</p> <p>Yes, the sponsor carried out the quantified analysis for fuel burn/CO2 impact. The sponsor used The Bournemouth Webtrack arrivals data for 2018 as an input to their 17-year traffic forecast of night arrivals of commercial aircraft benefiting from the change to distance reduction. The sponsor then estimated the savings in terms of reduced emissions and monetised fuel burn saving impacts on commercial airlines. The appraisal conducts the potential fuel burn/CO2 impact for all the options in sponsor's comprehensive list which would have an impact on the distance travelled.</p>				<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.5	<p>What is the total monetised impact of 3.3? (Provide details)</p> <p>The total monetised impact of the preferred option (Option 3d) is conducted in sponsor's cost benefit analysis only for the fuel burn impact on commercial aircraft benefiting from the change to distance reduction. The total benefits estimated over 10 years from 2020 assessed from sponsor's cost benefit analysis are listed below for each runway together with the total net present values.</p> <p><u>Option 3d: Limited T-bar 2 IAF RWY 26</u> Fuel savings: £394,594 CO2e emissions savings (traded): £39,058 CO2e emissions savings (non-traded): £23,252 Total NPV: £444,374</p> <p><u>Option 3d: Limited T-bar 2 IAF RWY 08</u> Fuel savings: £181,787 CO2e emissions savings (traded): £14,626 CO2e emissions savings (non-traded): £8,707</p>				

	<p>Total NPV: £166,408</p> <p>The sponsor has not conducted any quantified analysis for Option 3c because no change is anticipated in relation to fuel burn and CO2 emissions.</p>

4. Benefits of ACP				Status	
4.1	Does the ACP impact refer to the following groups and how they are impacted by the ACP?				
		Not impacted / Not applicable	Qualitative	Quantified	Monetised
4.1.1	Air Passengers	X			
4.1.2	Air Cargo Users	X			
4.1.3	General aviation users		X	X	X
4.1.4	Airlines		X	X	X
4.1.5	Airports		X		
4.1.6	Local communities			X	
4.1.7	Wider Public / Economy		X	X	X
4.1.8	<p>Details</p> <p>on the General Aviation/Commercial Air Transport mentioned above in answer to Question 3.5, the sponsor also informed that the inclusion of Initial Approach Fixes would increase the range of GA training and test exercises that could be provided at Bournemouth due to the fuel burn and operating cost savings from reduced transit flights. In addition to the fuel burn and emissions impact that is set out below; the inclusion of Initial approach fixes – that has potential to Increase in GA/Commercial Air transport Movements and the consequent increase that is possible in GA training and test exercises these movements would occur within the swathe of current existing movements and as such are not likely to represent any change from what would occur outside the effects of this ACP.</p>				

4.2	How are the above groups impacted by the ACP, especially (but not exclusively) looking at the following factors:			
		Not applicable	Qualitative	Quantified
4.2.1	Improved journey time for customers of air travel	X		
4.2.2	Increase choice of frequency and destinations from airport	X		
4.2.3	Reduced price due to additional competition because of new capacity	X		
4.2.4	Wider economic benefits		X	X
4.2.5	Other impacts	X		
4.2.6	Details Please see the answers to Question 3.5 and 4.1.8.			
4.3	What is the overall monetised impacts associated with 4.1 and 4.2 the above?			
	Please see the answers to Question 3.5.			
4.4	What are the non-monetised but quantified impacts of the above? (Insert details of description)			
	Savings in CO2 emissions was quantified by the sponsor for Option 3a, 3b and the preferred option 3d. The sponsor's estimation of the savings in terms of reduced emissions for 10-year forecast scenario from the CBA is as follows:			
	<u>Option 3a:</u>			
	CO2 emissions savings (kg): 818,043			
	CO2 emissions savings (t): 818			
	Fuel saved (kg): 259,696			
	<u>Option 3b: Limited T-bar 1 IAF (South) RWY 26</u>			
	CO2 emissions savings (kg): 1,617,806			
	CO2 emissions savings (t): 1,618			
	Fuel saved (kg): 513,589			
	<u>Option 3b: Limited T-bar 1 IAF (South) RWY 08</u>			
	CO2 emissions savings (kg): 694,651			

	<p>CO₂ emissions savings (t): 695 Fuel saved (kg): 220,524</p> <p><u>Option 3b: Limited T-bar 1 IAF (North) RWY 26</u> CO₂ emissions savings (kg): 1,151,659 CO₂ emissions savings (t): 1,152 Fuel saved (kg): 365,606</p> <p><u>Option 3b: Limited T-bar 1 IAF (North) RWY 08</u> CO₂ emissions savings (kg): 461,577 CO₂ emissions savings (t): 462 Fuel saved (kg): 146,533</p> <p><u>Option 3d: Limited T-bar 2 IAF RWY 26</u> CO₂ emissions savings (kg): 2,184,495 CO₂ emissions savings (t): 2,184 Fuel saved (kg): 693,491</p> <p><u>Option 3d: Limited T-bar 2 IAF RWY 08</u> CO₂ emissions savings (kg): 818,043 CO₂ emissions savings (t): 818 Fuel saved (kg): 259,696</p>	
4.5	<p>What are the qualitative / strategic impacts described above? Please see the answers to Question 3.5 and 4.1.8.</p>	
4.6	<p>What is the overall monetised benefits-costs ratio (BCR) of the policy? Is it more than 1? BCR has not been calculated by the sponsor. However, with the given monetisation for the benefits of the ACP and because there isn't any cost specifically mentioned and monetised, it is concluded that BCR is higher than 1.</p>	
4.7	<p>Have the sponsors provided reasonable justification for the proportionality of analysis above? The Sponsor has provided justification around the reason why they considered it would be disproportionate or not possible to provide monetised or quantified analysis by following the process outlined in CAP 1616. The issues where the CAA interpreted more detailed information could have been provided, these were highlighted in this document as a list of outstanding issues.</p>	<p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>

4.8	If the BCR is less than 1, are the quantitative and qualitative strategic impacts proportional to the costs of the ACP? BCR >1
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5. Other aspects	
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6. Summary of Assessment of Economic Impacts & Conclusions	
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6.1	The Full Options Appraisal is developed into a more detailed quantitative assessment, moving from a qualitatively defined shortlist options to the selection of preferred option as outlined in CAP 1616. Each shortlist options developed including the 'do nothing/minimum' option in particular all reasonable costs and benefits appraised qualitatively and quantitatively where proportionate. The sponsor also included the reasons why costs and benefits have not been quantified. The preferred option is appraised in detail setting out reasons of the preference in a clear explanation.
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Outstanding issues?		
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Serial	Issue	Action required
1	According to CAP 1616, change sponsors should take a pragmatic approach to valuing the various costs and benefits which may mean the use of ranges rather than precise figures. So, this is highlighted by the CAA for sponsor's reconsideration should they want to add more informative quantified detail on the infrastructure/deployment and operational costs associated with RNP approach implementation.	This is a suggestion from the CAA should the sponsor want to provide more informative cost and benefit analysis for the potential business users.
2		
3		
4		

CAA Full Options Appraisal Assessment Completed by	Name	Signature	Date
Airspace Regulator (Technical)	[REDACTED]	[REDACTED]	29/11/2019
Airspace Regulator (Economist)	[REDACTED]	[REDACTED]	29/11/2019
Airspace Regulator (Environmentalist)	[REDACTED]	[REDACTED]	29/11/2019
ATM – Inspector ATS (Ops)	[REDACTED]	[REDACTED]	29/11/2019