| INITIAL OPTIONS API<br>KEY Carry Forward<br>Carry Forward<br>Reject | PRAISAL<br>Meets objectives, insignificar<br>procedure<br>Meets objectives or has an in<br>Fails to meet one or more obj  | nt impact, and is the Preferred Option for this   | Rejected - Doos not meet constraints (e.g.<br>aingeace modemization, nor doos it meet<br>technical create of CAP1563); With be canned<br>forwards for 41 (Operation of proposal against<br>miniforment 121 comparison of proposal against<br>the baseline. Compliance<br>Compliance  | Preferred by staleholders - This is a Post<br>Engagement option where staleholders had<br>on-PANS OPS their input: Power track milks and fewer<br>overflown.   | hut loss attractive than the Post Engagement  | rs Preferred option of some non-aviation<br>t stakeholders but loss attractive than the Post<br>Engagement option (SID 27 AGGER Option 1D)  | (renicates current WA) denarture) but track   | s Stakeholder preferred option; follows shorted<br>possible route over the residential areas   | Only one practical option for direct routing to<br>TEMP2  | This option meets objectives but is assessed<br>expose more people on the ground to nois<br>than S10 09 AGGER Option 2.   | to Stakeholder preferred option; avoids residentia<br>e areas and follows the route of the motorway<br>initially   | Less attractive to stakeholden; increased nois<br>exposure versus SID 09 CAVEN Option 4 as<br>more people are overflown  | <ul> <li>Longer - more track miles, and does not<br/>minimize noise or people overflown versus<br/>other options.</li> </ul>   | Preferred by some non-aviation stakeholders;<br>fewer people overflown and follows the<br>motorway (Tigher ambient noise).  | Preferred by Stakeholders, and is the option that minimises overfight of people on the ground.  | Does not minimises noise or people overflown<br>versus other options  | Less attractive to stakeholders; increased nois<br>exposure versus SID 09 CORKA Option 3 as<br>more poople are overflown and significant<br>difference in track miles flown   | e<br>Preferred by Stakeholders, and is the option<br>that minimises overlight of people on the<br>ground.   |
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| Continuantes:<br>Continuantes:<br>Health and<br>exaiting of The     | Appraisal: Qualitative moise<br>protoc<br>delive<br>been<br>minim<br>also<br>i.e. w<br>sensi<br>erwir<br>of th  | Vend Approx all or the interfaceCond P<br>interface Provide Approx and P<br>explored Interface Approx and Approx and Approx<br>explored Interface Approx and Approx and Approx<br>explored Interface Approx and Approx and Approx<br>promotes Approx and Approx and Approx and Approx<br>and Approx and Approx and Approx and Approx and<br>a address and approx and Approx and Approx and<br>Approx and Approx and Approx and Approx and Approx<br>and Approx and Approx and Approx and Approx and Approx<br>and Approx and Approx and Approx and Approx and Approx<br>and Approx and Approx and Approx and Approx and Approx<br>and Approx and Approx and Approx and Approx and Approx<br>and Approx and Approx and Approx and Approx and Approx<br>and Approx and Approx and Approx and Approx and Approx<br>and Approx and Approx and Approx and Approx and Approx<br>and Approx and Approx and Approx and Approx and Approx and Approx<br>and Approx and Approx and Approx and Approx and Approx and Approx<br>and Approx and Ap | to hothing, continue with nature procedures 2002 77 AGRR Option 1<br>he track them by aircraft using communication of potent registrate at DME stage that<br>he track the the theorem is grown and the theorem is and the BME stage that and the BME stage that the theorem is and the BME stage that the theorem is and the BME stage that the stag | PE SID 27 AGGER Option 1b<br>to non-<br>Flown at optimum aircraft performance and<br>with continuous Climb profile to minimise nois<br>The procedure takes a more direct route to  | SID 27 AGGER Option 2<br>Flown at optismum alreadt performance but<br>worfflies a cloud at 2000th and a hospital at<br>4000th within but up areas. Incorporate<br>continuous clines to minimise noise and offler<br>flewer residential areas overflown companed to<br>SID AGGER Option 3.   | O 27 Addite Option 3     Proper of optimizations, performance, measures across performance, performace, performance, performace, performance, performance, performanc | SD27364264051<br>Beart optimum carbon professional<br>memory carbon professional professional<br>carbon professional carbon in resultant<br>temporalization of the transmission<br>resultant<br>temporalization of the transmission<br>results  | SID 27 WAL Option 2<br>Flow at optimum already and an analysis of the second se | SID 27 TEMP2<br>Flow at optimum aircraft performance;<br>minimize noise. The procedure overfiles<br>Easthane Country Park after departure, 3.2 em<br>on the extended centrelime. The procedure also<br>files in the vicinity of schools in Bebington.<br>Incorporates continuous Celler particles to<br>minimize the impact of noise. Fles over<br>non-labeler azies of Alsinoteto and Halow More | So the address and the second performance<br>means rate in the proceeding of the second performance<br>means and the second performance of the<br>second performance of the second performance<br>and the second performance of the second performance<br>the second performance of the second performance<br>the second performance of the second performance<br>of the second performance of the second<br>performance of the second period performance<br>of the second performance of the second<br>period performance of the second period period period<br>period period period period period period period period<br>period period period period period period period period<br>period period period period period period period period period<br>period period period period period period period period period period<br>period period period period period period period period period period<br>period period period period period period period period period period<br>period period period period period period period period period period<br>period period period period period period period period period period period<br>period period p | SID 09 AGGER Option 2<br>Flown at optimum aircraft performance;<br>minimises noise. 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Overflies Hale Primary School   | 50.00 CARSA Spatien 4<br>Bears et aptismum and particular production and spatial<br>memory reals. The procedure anarchical performance,<br>memory reals. The procedure anarchical performance<br>and the state of the spatial spatial spatial<br>perplanted areas of the spatial spatial<br>spatial spatial reaso of the spatial spatial<br>spatial spatial spatial spatial spatial spatial spatial spatial spatial spatial spatial<br>spatial spatial spatial spatial spatial spatial spatial spatial spatial spatial<br>spatial spatial spatial<br>spatial spatial spatial<br>spatial spatial spatial<br>spatial spatial spa | SID 09 CORKA Option 1<br>Flown at optimum aircraft performance;<br>minimises noise. Unavoidably overflies Hale<br>Primary School after departure, 1.5 mm on the<br>extended centreline. The procedure also<br>overflies schools in Buncom and Frodsham.   | So the Clock Applies 2<br>How at applications alterating performance,<br>melinisis and automatic performance,<br>and enganture, 15 and on the astandard<br>therapprotection and and the source<br>incorporates contributions of direct to<br>be applied at a size of Walnes, Neyton and<br>Deepool.   | 50.00 COMA Option 3<br>Book of cytoma wyster performance<br>mennes notes. The procedure average for the many<br>strange for the date date of the second second second<br>attended names, estimate the second second second<br>attended names, estimate and a popula<br>works and the second second second second<br>represents the minimum nucleus of popula<br>works and second second second second<br>second second second second second second second second second<br>second second second second second second second second second<br>second second second second second second second second second second second<br>second second |
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| Wider Society Capacity and resilience                               | capa<br>onig<br>The c<br>desti<br>struc<br>the h<br>comm  | earbly, the introduction of PNN is based on<br>energy benefits in terms of increasing increase<br>acity leading to more predictable routins, leven<br>pround and in air delays experiences of a virines. In<br>completion of the entrie route from airport to<br>insider via PNI leading to a more effective route in<br>insider via PNI leading to a more effective route in<br>fliphese priority for the global aviation<br>munity.   | Junctaning starts procedure is work maintain<br>and capacity however, mellinois and but<br>gelfactarty (Junctart). La value fait to meet<br>start and the start and the start and the start<br>and the startpart mellinois priorities<br>including coordination with FASI N  | The procedure has been designed to integrate<br>with the en-route structure.   | The procedure has been designed to integrat<br>with the en-route structure.   | <ul> <li>The procedure has been designed to integrate<br/>with the en-route structure.</li> </ul>   | The procedure has been designed to integrate<br>with the en-route structure.  | <ul> <li>The procedure has been designed to integrate<br/>with the en-route structure.</li> </ul>  | The procedure has been designed to integrate<br>with the en-route structure.  | The procedure has been designed to integra<br>with the en-route structure.  | In the procedure has been derigned to integrate<br>with the en-route structure.  | The procedure has been designed to integrate<br>with the en-route structure.   | The procedure has been designed to integrate<br>with the en-route structure.   | The procedure has been designed to integrate<br>with the en-route structure.  | The procedure has been designed to integrate<br>with the en-route structure.  | The procedure has been designed to integrate<br>with the en-route structure.  | The procedure has been designed to integrate<br>with the en-route structure.  | The procedure has been designed to integrate with the en-route structure.   |
| General Aviation Access   | Appraisal: Qualitative Proce<br>chan<br>will c<br>oper<br>may 1<br>grou<br>intro  | hange to existing airspace arrangements. As dealer which contained within extantised within extant ACS, no C age to GA access to airspace. GA users of LLA or get to GA access to airspace. GA users of LLA to a containe to airse addealer users of the bighthy improved Via a reduction in on-<br>nd and in-air datays brought about by the<br>duction of PBN. Is based on N  | io change to existing arispace arrangements.<br>A view of LLA with existing arrangements are<br>spart under exist operational arrangements.  | No change to existing airopao arrangements.<br>Procedure wholly contrained within extract CH<br>no change to GA access to airopace. GA users<br>LLA will continue to annue and depart under<br>extant operational arrangements.<br>This is a 59%/IRAW recordures and contributor   | No change to existing airspace arrangements<br>Procedure whiley contained while in extant CA<br>of no change to GA access to airspace. GA user<br>LLA will continue to airsh and depart under<br>extant operational airrangements.<br>This is a BRN/PNEM verventure and mentioned   | No change to existing airpace arrangements:<br>§ Procedure wholey contained with the extract CAS,<br>§ Procedure wholey contained with extract CAS,<br>of no change to GA access to airpace. GA usero<br>LLA will containe to arrive and depart under<br>extant operational arrangements.   | No change to existing airpace arrangements<br>Procedure wholey contained within extant CR4<br>no change to GA access to airpace. GA uses<br>LLA will continue to arrive and depart under<br>extant operational arrangements.  | No change to existing airpace arrangements:<br>§ Procedure wholey contained with the extract CAS<br>of no change to GA access to airpace. GA users<br>LLA will containe to airing and depart under<br>extant operational airrangements.  | No change to existing airpace arrangements.<br>Procedure whole contained within exact CAS,<br>no change to GA access to airpace. GA users of<br>LLA will continue to airine and depart under<br>extant operational arrangements.<br>This is a PRIV/RAV encodeus and nontributes.  | No change to existing airspace arrangement<br>Procedure wholey contained while is extant (2<br>no change to GA access to airspace. GA user<br>LLA will containe to anim and depart unde<br>extant operational airrangements.  | No charge to existing airpace arrangements.<br>Procodure whole contained with the examt CAS,<br>Sho of the charge to GA access to airpace. GA sums<br>LLA will containe to airware and depart under<br>extant operational arrangements.     This is a 298//IRLB/ / enreafery and metrichence   | No charge to existing airpace arrangements:<br>Procedure whole contained within extrant CAS<br>no charge to GA access to airpace. GA users<br>LLA will continue to arrive and depart under<br>extant operational arrangements.   | No change to existing airpace arrangements:<br>Procedure wholly contained within extract CAS,<br>of no change to GA access to airpace. GA users<br>LLLA will containe to arrive and depart under<br>extant operational arrangements.<br>This is a PRN/PNLW renovalines and controllations  | No change to existing airpace arrangements:<br>Procedure whole contained within exatter CAS,<br>In ochange to GA access to airpace. GA users o<br>LLB will contain to airrive and depart under<br>extant operational arrangements.<br>This is a PRN/RNAV encoding and contributors  | No change to existing airpace arrangements:<br>Procedure whole contained within examt CAS,<br>if no change to GA access to airpace. GA users o<br>LLLA will continue to arrive and depart under<br>extant operational arrangements.   | No change to existing airpace arrangements:<br>Procedure whole contained within exatt CKS,<br>no change to GA access to airpace. GA users of<br>LEA will continue to arrive and depart under<br>extant operational arrangements.<br>This is a PRI/IRNAY encoded and contributes   | No charge to existing airpace arrangements:<br>Procedure whole contained within extrant CAS,<br>no charge to GA access to airspace. GA users<br>LLA will continue to arrive and depart under<br>extant operational arrangements.<br>This is a PBN/BMAY revenders and metrolihites   | No change to existing airpace arrangements.<br>Procedure whole contained within examt CAS,<br>of no change to GA access to airpace. GA users of<br>LLA will continue to arrive and depart under<br>extant operational arrangements.<br>This is a PBN/PNAV recordure and nontributes:  |
| connercal arther<br>effective capacity                              | Appraisal: Qualitative delivery<br>capa<br>ong<br>this<br>cont<br>trans<br>capa<br>LLA<br>com<br>any is<br>dep<br>char<br>it is<br>cont<br>trans<br>capa<br>LLA<br>com<br>any is<br>dep<br>char<br>it is<br>cont<br>trans<br>capa<br>capa<br>capa<br>capa<br>capa<br>capa<br>capa<br>cap  | and is benefit to terms of increased a provide the output of the output   | antimute use of extract procedure, therefore<br>a economic bandfit for GA/antios:  | to the definery of associated benefits have been<br>associated affective capacity where the superface<br>to the superface and the superface<br>to a selfness and general associate.  | to the devine y of associated sensitivity include<br>morecased effective apply which is protected<br>to have direct and indirect discounce bandle<br>for a times and general values.  | B the device of an accurated workful the substitute<br>on constant of effective analysis is a packed by<br>the operated and effective and packed by<br>the operated and the substitute<br>of address and general auxilian.  | to the default of tassociated benefits succising<br>meaned effective scalar by which is prefect<br>to have direct and indirect economic bandle.<br>Or address and general asociation  | bit the device of a second of control is nearbing<br>reconstant of feature second second second second second<br>feature second second second second second second<br>for artifices and general avoids.  | Is the darker of associate bunchs is suching<br>increased influence and provide a product of<br>the antines and general and the   | to the delivery of associated territor, include<br>increased effective approximation protocol<br>to have direct and indirect economic benefit<br>for altificer and general vectors.   | Is the developed associated sensitive successful<br>increased effective stepping which is particular<br>increased and effective specific sensitive<br>for artifician and general address.  | to the dailway of associated bundles including<br>monand effective activity which is predicted<br>to have direct and indirect economic bandles<br>for address and general association.   | In the divergence of associated bundles in schuling<br>concerned effective schule publick is predictive<br>concerned and the schule public is predictive<br>for adfress and general available.   | Is the delayer of resolution to survive in multi-flag<br>increased if the two sectors of the sectors of the sectors<br>for a direct and general adults.   | Is the delivery of associated bunches in success  | to the derivery of associate bureful studies;<br>increased affective carry which is prediction<br>to the studies of the studies of the studies of the studies<br>for artifices and general addition.  | to the deferrent of associated benefits including<br>messared effective capacity which is predicted<br>to have direct and indirect economic benefits<br>for anthous and general avoidor.  | In the dataset of associated bounds in studying<br>conceased effective section which is particularly<br>conceased effective section which is particular<br>for adfress and general instation.   |
| General Aviation / Fuel burn<br>commercial airlines                 | Appraisal: Qualitative optio<br>migh<br>the ir<br>assor<br>climb  | noption has been assessed against other<br>on: based on whether any factors of the design<br>introduction of RNAV procedures and<br>kited predictability of tracks, continuous<br>flokescen, reduction in tactical intervention is<br>kited to result in reduced fluel burn versus the<br>line.   | uel born predicted to be greater (and less<br>medicitable (for conventional procedures due<br>bolieght environitions and activates dailyon)<br>descella anterior data and anterior<br>descella anterior data anterior data anterior<br>separation an professional anterior<br>separation of manipation experiment.   | Track Length 20.8MM<br>This options represents the shortest practical<br>roots with a continuous clinic bin profile metaling<br>optimum engine settings. The route integrate<br>alrcation to the annexity structure, predicad t<br>minimize fast burn.   | Tack length 22.4NM<br>This option is not the most direct route but it<br>incorporates continuous Gimb goffie<br>enabling optimum engine settings. The route<br>integrates aircraft into the airways structure,<br>predicted to minimise fuel bum but due to<br>slightly increased track miles compared to SI<br>27 AGGER Option 1b, is less attractive.   | initial left turn after take off. The route   | Track Length 10.4NM<br>This Option is 0.8NM shorter than SID 27 WA<br>Option 2 and therefore may require negligibly<br>less fuel.   | Track Length 11.2 NM<br>1. This Option is 0.8 NM longer than SID 27 WAL<br>Option 1 and therefore may require negligibly<br>more fast.   | Track Length 34.7NM<br>Only one practical option; track length will<br>inform the Full Options Appraical stage to<br>determine Fuel Burn.   | Track Length 31.7NM<br>This Option is LSMM longer than Option 2 a<br>may result in negligible additional fuel burn.   | Track length 29.3NM<br>Shortest practical roads, track length will<br>inform the Higherine Apparial stage to<br>determine Fuel Burn.   | Track Length 15.48M<br>Shorter practical routin predicted to result in<br>based that Iburn. Reacessary height reacts<br>for all practical routes to CAVEN may result in<br>comparatively greater half burn versus other<br>procedures.   | Track Length 20.4NM<br>Longest route: predicted to result in greatest<br>lust burn. Necessary height restrictions for all<br>practical routes to CAVEN may result in<br>comparatively greater fuel burn versus other<br>procedures.  | Track Length 17.9NM<br>2.5NM Longer than Option 1 representing<br>increased fuel burn.<br>Necessary height restrictions for all practical<br>routes to CAVEM may result in comparatively<br>greater fuel burn versus other procedures.  | Track Length 12:9NM<br>2:5NU Longer than Option 1 representing<br>increased faile burn.<br>Necessary height restrictions for all practical<br>routes to CAVEN may result in comparatively<br>greater fuel burn wersus other procedures.   | Track Length 13.SNM<br>2.4MM longer than Option 3 but continuous<br>climb enable: optimum aircraft performance<br>minimising fuel burn.   | Track Length 23.9NM<br>This option is double the length of Option 3 do<br>to issiful with hand runn routing aircraft to the<br>north before tracking south for TEMP2.   | Track Length 11.1NM<br>e Shortext Track length due to right hand turn<br>south direct to TRM2, continuous Clinb<br>enables optimum aircraft performance<br>minimising fuel burn.  |
| Commercial airlines Training costs                                  | Appraisal: Qualitative requi<br>asses<br>airlin<br>numi<br>alrea<br>comp<br>will n<br>versa<br>perfer<br>aircr  | expected that PRoJC/rew Training will be 4 by<br>detection analysis pick to fight the new MAV<br>advance. It is not proportionate for LLA to<br>as the proportionate for LLA to<br>as straining costs for individual commercial<br>esc due to the significant variables in noted<br>esc due to the significant variables in plot<br>generacija. It how many training tom individual<br>angulenta, dia how many training tom individual<br>required, and min policito en training the individual<br>remarket, variables in on board equipment and<br>and controls esc.   | o zaštovul travneg postcevi.   | It is expected that PRU(Cleve Training all the<br>required teacher places that the new RMU<br>procedures it is not proportional for LLAD with<br>all final due to the significant calculates involve<br>(see General Approximat of PRIV/INVV)  | required to enable pilots to flight the new RN procedures. It is not proportionate for LULA to  | It is expected that PRU(Cover Training at Be<br>required to enable points to flight the new RNA<br>procedures. It is not proportionate for LLA at<br>access training costs for individual commercial<br>at access training costs for individual commercial<br>at allines due to the significant variables involved<br>(see General Appraical of PRN(RNAY)   | E le ingestant that Plac/tww Training will be<br>required to analyzints to flight the new RW<br>procedures. It is not proportionate for LLN be<br>assess training costs for individual commercia<br>alfines due to the age/East variables involve<br>(see General Appraisal of PBN/RMAV)  | It is expected that PRU/CVP Training will be<br>required to enable plots to flight the new INAL<br>procedures: It is not proportionate for LLAb<br>assuss training excits for individual commercial<br>a altines due to the significant variables involves<br>(see General Appraical of PRN/INAV)  | required to enable pilots to flight the new RNAV<br>procedures. It is not proportionate for LILA to   |   | It is expected that PRo(Core Training all Bar<br>required to avail points to flight that man RNA<br>procedures. It is not proportionate for LLA<br>assess training casts for individual commercial<br>adims due to the significant variables involved<br>(and Comman Apprairaid of PRN/RNAV)   | E le opportent fluit PloyCore Yraning will be<br>engined to enable plotts to flight the new NAA<br>procedures. It is not proportionate for LLAb<br>assess training costs for individual commercial<br>airlines due to the ageilCant variables imclues<br>(see General Appraial of PBA/RNAV)  | E is expected that Plac/Cere Yraning will be<br>required to enable placts to flight the new FMA<br>procedures. It is not proportionate for LLAs<br>aussess training costs for individual commercial<br>articles due to the significant variables involved<br>(see General Appraial of PBA/RNAV)  | It is expected that Plex(Ceer Training will be<br>required to enable plexits to flight the new RNA<br>procedures. It is not proportionate for LLA-<br>neases training costs for indebdue commercial<br>arities due to the agnificant writables involved<br>(see General Appraial of PBN/RNA)  | It is expected that PleyCrew Training will be<br>required to analysis to flight the new RMA<br>procedures. It is not proportionate for LLAD<br>assess training costs for individual commercial<br>aritises due to the significant variables involved<br>(see General Appraial of PBN/RNAY)  | It is expected that Pitol/Ceve Training will be<br>required to analysis to flight the mex RNA<br>procedures. It is not proportionate for LLA to<br>assess training costs for individual commercial<br>airlines due to the significant variables involved<br>(see General Appraisal of PBN/RNAV)   | It is expected that Plot/Crew Training will be<br>required to analyzins to flight the new NAA<br>procedures. It is not proportionate for LLAD<br>assess training costs for includual commercial<br>airlines due to the significant variables involved<br>(see General Appraical of PBN/RNAV)  | It is expected that PNo/Cere Training will be<br>required to anabigatisc to flight the new RMAV<br>procedures. It is not proportionates for LLA to<br>assess training occurs for individual commercial<br>articles due to the agenticate variables involved<br>(see General Appraia) of PBN/RMAV)   |
| Commercial airlines Other costs                                     | navig<br>incre<br>not p<br>costs<br>proc<br>airlin<br>may r   | er costs to commercial airlines may include<br>ates to Fight Management Systems (FMS),<br>gation databases and operating procedures,<br>tasad pilot hire costs versus training etc. It is<br>proportionate for LLA to assess the "other<br>or to commercial airlines of flying BNAV<br>of to commercial airlines of hyng BNAV<br>of the other and the second second second<br>nes: may aircady to PBN ready whereas others<br>not.  | is not proportionate for CLAR to assess     term any be constrained with maintaining     provide the constrained with maintaining     proprime to control my high consentional     alignation but them are too many variables     againcrit hops, or howed sprans capability     to, In consider these effectively.  | navigation databases and operating<br>procedures, increased pilot hire costs versus<br>training etc. It is not proportionate for LILA to<br>assess the 'other costs' to commercial airliner<br>of flying INAV procedures due to significant  | Other costs to commercial attines may inclu-<br>updates to Fight Managament System (TM)<br>analgation stabaloss and operating<br>procedures, increased pilot hire costs venue,<br>ratining etc. It is no opportionate for LLA to<br>assess the 'other costs' to commercial attine<br>of hing RWU recosts' to commercial attine<br>of hing RWU recosts' so commercial attine<br>analy whereas others may not.<br>Ready whereas others may not. | 46 Other costs to communical aritims may include<br>(), updates to Tright Management Systems (FMS),<br>navigation distabases and operating<br>procedures, (pressed pilot thire costs versus<br>training etc. It is not proportionate for LLAN or<br>assess the future costs to commencial airlines<br>of flying RNAV procedure due to significant<br>validaties, communications may along by PRH<br>maddy whereas others may not.   | Other costs to commercial advises may includ<br>opdates to Fight Maragement Systems (FMA<br>majgation databasis and operating<br>procedures, increased pilot there costs versus<br>variang sets. It is not proportionate for LLA to<br>assess the other costs' to commercial alitnes<br>of fing RNAV producers due to significant<br>variables, some alitnes may and yeardy be YBN<br>ready whereas others may not. | navigation databases and operating<br>procedures, increased pilot hire costs versus<br>training etc. It is not proportionate for LLA to<br>assess the 'other costs' to commercial airlines<br>of theire RNAV more due to selficant   | training etc. It is not proportionate for LLLA to<br>seases the "other cost" to commercial altimes<br>of flying RNAV procedures due to significant<br>variables; some altimes may already be "PBN<br>ready" whereas others may not.   | navigation databases and operating<br>procedures, increased pilot hire costs versus<br>training etc. It is not proportionate for LLA 4<br>assess the 'other costs' to commercial airline<br>of thise BMAV remediates due to desificant  | to training etc. It is not proportionate for LILA to<br>assess the 'other costs' to commercial airlines<br>of these RNAV exercises due to conificant   | Other costs to commercial alforsis may include<br>opdates to Fight Maragement Systems (FMS)<br>migration databases and operating<br>procedures, increased pilot the costs versus<br>taning etc. It is not proportionate for LLM to<br>assess the "other costs" or commercial alfores<br>of fing RNW producting data significant<br>wardales; some alfores may askedy be "PBN<br>ready" whereas others may root.  | Other coasts to commercial airlines may include<br>updates to Flight Maragement Systems [FMS]<br>margizetion distabases and operating<br>procedures, increased pilot hire costs versus<br>trainingent: It is not proportionate to FULA to<br>assess the 'other costs' to commercial airlines<br>of hyse (RNM) procedures due to significant<br>variables, some airlines may already be 'PBN<br>ready' whereas others may not.  | Other costs to commercial aliniais may lecided<br>updates to Fight Management Systems (FMS),<br>analgation databases and operation<br>procedures, increased pilot his costs versus<br>training etc. Its incorproportionate for LUA to<br>assess the 'other cost's to commercial alines<br>of frying RNA's procedures due to significant<br>variables; some airlines may already be 'PEN<br>ready' whereas others may not.   | Other costs to commercial alithics may include<br>updates to Fight Management Systems [FMS],<br>analgstion databases and operating<br>procedurus, increased pilot hire costs versus<br>raining ett.: It is not proportionato for ULA to<br>assess the 'other costs' to commercial alities<br>of fring RSMM procedures due to significant<br>variables; some alities may already be 'PBN<br>read' whereas others may not.  | Other costs to commercial alifines may include<br>updates to Flight Management Systems (FMS),<br>navigation dratabases and operating<br>procedures, increased pilot hire costs versus<br>training etc. It is not proportionate for ULA to<br>assess the 'other costs' to commercial alifines<br>of flying RNAP upcodures due to significant<br>variables; some alifines may atoxidy be 'PBN<br>ready' whereas others may not. | Other outs to commercial alfains may include<br>updates to Flight Management Systems (FMS)<br>analysis of status and operating<br>procedures, increased pilot hire costs versus<br>taning etc. It is not proportionate for ULK to<br>assess the "other costs" to commercial alfains<br>of hyng INAU productines due to significant<br>variables; some alfainse may already be "PBN<br>ready" whereas others may not.  | Other costs to commercial airlines may include<br>updates to Fight Management Systems (FMS),<br>analyzism distabases and operation<br>procedurus, increased pilot hire costs versus<br>training etc. It is not proportionate for LUA to<br>assess the 'other costs' to commercial airlines<br>of fring RMAV procedures due to significant<br>variables; some airlines may aleady be 'PBN<br>ready' whereas others may not.  |
| navigation service costs<br>provider                                | Appraisal: Qualitative no ac<br>intra<br>navig<br>foum<br>aircr<br>prop<br>perfe  | petons relate to the implementation of PRN and B<br>diditional infrastructure is required. The r<br>duction of PRN reduces the relatance on<br>structure, in particular ground based or<br>partin aits are no longer needed. The<br>dation for PRN's trans naivgation or RNAV,<br>part arriving and departing LLA using the<br>normance based naivgation capability.  | saktig ultimatuture is subject to<br>innoval intracture is experienced<br>that subject in the second second second<br>avereficial procedures however maintaining<br>cases to ground based equipment may be<br>rabilitively expensive.  | No additional infrastructure required (see High<br>Lovel Appraisal of PBN/BNAV.  | No additional infractructure required (see Hi<br>Level Appraisal of PBN/IBNAV.  | , no descent in according regard the High   | Level Appraisal of PBN/PBNAV.   | No additional infractructure required (see High<br>Level Appraisal of PBN/INUX).   | No additional infrastructure required (see High   | No additional infrastructure required (see Hi<br>Level Appraisal of PBN/BNAV.   | (h) No additional infractiveture required [see High<br>Level Appraisal of PRIV/INKIV.  | Level Appraisal of PBN/RNAV.   | No additional infrastructure required (see High<br>Level Appraisal of PBN/RNAV.  | Level Appraisal of PBN/PDNAV  | No additional infrastructure required (see High   | No additional infrastructure required (see High   | ne unditione measurature regime tide High   | No additional infrastructure required (see High   |
| Airport / Air<br>navigation service<br>provider                     | Appraisal: Qualitative bene<br>gene<br>impr<br>redu<br>any c<br>rega<br>consi   | D lat Improved Operational Efficiency as a h<br>field delivered by the introduction of PRN. In t<br>and LLA prodicts that operational efficiency will<br>ore and that there may be potential for a net<br>action in operational costs. It is be the same<br>indices of which option is chosen. This will be<br>iddeerd further at Full Options Appraisal stage.   | io charge to operational cost are attributable<br>matchaning the extension procedures except<br>oxably at the case of infrastructure (see<br>lowe).  | Operational Costs are not predicted to vary by<br>individual option.   | Operational Costs are not predicted to vary b<br>individual option.   | <ul> <li>Operational Costs are not predicted to vary by<br/>individual option.</li> </ul>   | Operational Costs are not predicted to vary by<br>individual option.  | <ul> <li>Dperational Costs are not predicted to vary by<br/>individual option.</li> </ul>  | Operational Costs are not predicted to vary by<br>individual option.  | Operational Costs are not predicted to vary t<br>individual option.   | by Operational Costs are not predicted to very by<br>individual option.  | Operational Costs are not predicted to vary by<br>individual option.   | Operational Costs are not predicted to vary by<br>individual option.   | Operational Costs are not predicted to vary by<br>individual option.  | Operational Costs are not predicted to very by<br>individual option.  | Operational Costs are not predicted to vary by<br>individual option.  | Operational Costs are not predicted to vary by<br>individual option.  | Operational Costs are not predicted to vary by<br>individual option.  |
| Arport, Air<br>navigitation service<br>provéder                     | the ir<br>inclue<br>unde<br>proce<br>docu<br>Pr2 u  | logment costs are attributable to the<br>doction of PB/NRAWA procedures rather than<br>individual IPE options themselves. Costs will<br>down ACTO training and compatency (based on<br>extranding aircraft performance and ATC<br>costner relating to RNV). Aerodrome<br>unmentation and procedures updates (e.g. MATS<br>audates, participates, paynent to Cast).  |  | Deployment costs are not predicted to vary by<br>incluidual option.  | Deployment costs are not predicted to vary b<br>individual option.  | <ul> <li>Deployment costs are not predicted to vary by<br/>individual option.</li> </ul>  | Deployment costs are not predicted to vary by<br>individual option.   | <ul> <li>Deployment costs are not predicted to vary by<br/>individual option.</li> </ul>   | Deployment costs are not predicted to vary by<br>individual option.   | Deployment costs are not predicted to vary t<br>individual option.  | by Displayment costs are not predicted to vary by<br>individual option.  | Deployment costs are not predicted to vary by<br>individual option.  | Deployment costs are not predicted to vary by<br>individual option.  | Deployment: costs are not predicted to vary by<br>individual option.  | Deployment costs are not predicted to vary by<br>individual option.   | Deployment costs are not predicted to very by<br>individual option.   | Deployment costs are not predicted to vary by<br>individual option.   | Deployment costs are not predicted to vary by<br>individual option.   |
| Safety Assessment Safety<br>Assessment                              | is on<br>imple<br>been  | benefit of the introduction of RMN is the<br>covernent in safety and in fact XCM decline it as<br>in the interference of the interference of the<br>interf RMA in decline it and in safety accounts to<br>a carried on the main application is a prevent,<br>is interceived in the interference RMW appearable<br>are a safety benefit to the airport and its users.  | No standard secondard in that comment<br>to the standard secondard second second at DPE of<br>stant conventional and RNAV procedures.  | bit Significant<br>Configue durb transitions procedures managed<br>unretical separation.<br>Configue durb hawardes to staffe to be managed<br>by clinik gradient and minimum abitude<br>waypoint.  | Not Significant<br>( Configure with strandition procedures managed<br>Some canfigure with Manchester current<br>procedures; managed through coordination<br>with Manchester ACP development.  | Vec Spancer:<br>by Cavity of the second procedures managed by<br>Cavity of the second processing of the<br>Cavity of the second processing of the<br>clobe proteins requirement and minimum<br>altitude wappoint.   | Not Significant<br>Conflict with transition procedures managed I<br>writical appraction.  | Not Significant<br>y Conflict with transition procedures managed b<br>vertical separation.   | Not Significant<br>Confict exploration<br>Confict exploration.<br>Workfort and how-controller managed by<br>chink gradient requirement and minimum<br>altitude waypoint.  | Not Sprikant<br>Contrained to Approach MAP managed by<br>Contrained Happanian.<br>Contrained Manchester MRGI India to be<br>managed through coordination with<br>Manchestra AP2 evaluations.<br>Contrained Homogeneoust and minimum<br>altitude waypoint.   | vertical separation.<br>Conflict with Manchester MIRSI hold to be<br>managed through coordination with   | Not Significant<br>Confict with Manchester IFAs to be managed<br>by coordination with Manchester ACP<br>development.   | Net Sprithant<br>Confict with R Approach MAP managed by<br>Confict with RAnchater (FFs to be managed<br>through coordination with Mancheter ACP<br>development.<br>Confict with Hewarden traffic managed by<br>Clinit gradient requirement and minimum<br>altitude waypoint.   | Not Significant<br>Confict with DR Approach MAP managed by<br>Confict with DR Approach MAP managed<br>through coordination with Manchester ACP<br>development.<br>Confict with Hawarden toRin managed by<br>Confict with Hawarden toRin | Net Sprificant<br>Conflict with Manchetter FPr. to be managed<br>Unrogit Confliction with Manchetter ACP<br>development.  | Not Significant<br>Confict with offention with Manchester ACP<br>Honologonatic<br>Confict with Hawardsen traffer managed by<br>children gradent requirement and minimum<br>altitude waypoint.   | Not Significant<br>Confict with Depondent MAP-managed by<br>Confict with Mancheter FPF to be managed<br>through coordination with Mancheter ACP<br>development.   | Not Significant<br>Conflict with Manchenter IP-No be managed<br>winning one with Manchenter ACP<br>development with Manchenter ACP<br>Conflict with Haunchen tottle managed by<br>Conflict with Haunchen tottle managed by<br>Although the second second second second second<br>attraction of the second second second second second<br>second second second second second second second<br>second second second second second second second<br>second second second second second second second<br>second second second second second second second second<br>second second second second second second second second second<br>second second s  |

| INITIAL C<br>KEY                                |  | PRAISAL<br>Meets objectives, insi<br>procedure<br>Meets objectives or I<br>Fails to meet one or n | gnificant impact, and is the Preferred Option for this<br>has an insignificant impact but is less attractive<br>nore objectives or has a significant impact that cannot  | Only one practical option for most direct transition.  | Only one practical option for most direct transition.   | Track miles and noise are as low as reasonably<br>practicable within the constraints. Preferred<br>Option.  | Less attractive, greater track miles and more<br>y people overflown however this option is<br>required as an alternative when MAN using<br>Rumway 05.  |  | Only one practical option for most direct transition.  | Only one practical option for most direct transition.  | Replaced by Post Engagement<br>Approach 27 Option 1b - new hold position<br>preferred by stakeholders and met more<br>objectives   | Offers fewest practical track miles, the minim<br>exposure to noise and people over the ground<br>amended original Option 1 with stakeholder<br>input.<br>Post Engagement   | <ul> <li>This Option was rejected at the DPE stage du</li> </ul>  | Does not minimise noise or overflight of<br>e residential areas; potential for increased fue<br>burn due to continuous descent not always<br>being possible   | Does not minimise noise or overflight of<br>residential area; Option 3 position of hold<br>preferred over this option, subsequently<br>replaced by post engagement Approach 09<br>Option 39  | Does not minimise noise or overflight of<br>residential areas; Option 3 position of hold<br>preferred over this option, subsequently<br>replaced by post engagement Approach 09<br>Option 3b  |  |
|---|--|---|--|--|---|---|--|--|--|--|--|---|---|---|--|---|--|
| Group   |  | Level of Analysis   |  | Trans 27 DIOUF   | Trans 27 NOMSU  | Trans 27 VEGUN  | Trans 27 VEGUN (CCD5)  | Trans 09 DIOUF   | Trans 09 NOMSU   | Trans 09 VEGUN   |  |   |   | Approach 27 Option 3  | Approach 09 Option 1   | Approach 09 Option 2  | Approach 09 (  |
| Communities                                     | Noise impact on<br>health and<br>quality of life   | Initial Options<br>Appraisal: Qualitative   | Ingeneral MAV processors are practice to induce<br>the appears many and convertical<br>and appears many and convertical<br>and appears many and appears and appears<br>with appears and appears and appears<br>and appears and appears and appears and appears and appears<br>and appears and appears and appears and appears and appears<br>and appears and appears and appears and appears and appears<br>and appears and appears and appears and appears and appears<br>and appears and appears and appears and appears and appears and appears<br>and appears and appears and appears and appears and appears and appears and appears<br>and appears and ap          | two small country parks, above 2,000 ft.<br>Overflies residential areas of Crosby and<br>Liverpool in the vicinity of a number of schools<br>and close to hospitals, but aircraft will be at<br>above 5,000 ft and in the descent, so will have<br>t reduced noise commensurate with lower power<br>settings. Routing is planned over industrial   | improved decent profile, although height<br>restrictions at NEW3 due to Manchester arrivals<br>traffic nestricts the use of a continuous descen<br>profile which prevents minimising of noise. The<br>procedure alto passes over two small country<br>er parks, above 2,000 ft. The procedure overflee<br>residential areas of Liverpool in the vicinity of a | <ul> <li>areas in Broughton and Chester, where aircraft<br/>will be at, or above, 3,000 ft. The procedure<br/>does not incorporate a continuous descent</li> <li>profile due to a height restriction of 3,000 ft at</li> </ul>  | Overflies residential areas of Liverpool,<br>all Birknehead, and Huyton, in the vicinity of<br>t schools and hospitals, but at altitudes greater<br>than 4,000 ft. Passes over two small country<br>parks, above 2,000 ft. Height restriction of<br>t 4,000 ft at NEW3 due to Manchester arrival                               | The scaling of this procedure is in the schedy<br>event at double, in produce the the schedy<br>event at double, in produce the schedure<br>and the schedure schedure at the schedure<br>and the schedure schedure at the schedure<br>and the schedure schedure at the schedure<br>schedure at the schedure schedure<br>and an example at the schedure schedure<br>the remaindure of this function on the schedure<br>and an example schedure schedure<br>and an example schedure<br>the schedure schedure<br>and and the schedure<br>schedure schedure<br>and and the schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>schedure<br>sch | [7] The product remains over the size at a 10 mine<br>benchman rate analysis. In signal the CM year<br>solution is available to meet evolution<br>explorements.  | The proceedure states and discrit young and<br>sensitive years but notes in the violation of<br>the sensitive states but notes and the sensitive states<br>incorporates a continuous designs, more than<br>the sensitive states and the sensitive states<br>and the sensitive states are provided in the law<br>and the sensitive states are provided as<br>allowed and allowed and allow. Only one<br>properties the sensitive states are provided<br>allowed and states are provided to more encoder<br>and the sensitive states are provided as<br>the sensitive states are provided as<br>a sensitive states are as<br>a sensitive state and<br>a sensitive states are as<br>a sensitive state as<br>a sensitive s | noise. The procedure files over, or close to, a<br>number of schools in the built-up areas of<br>Warrington and Runcorn on final approach.<br>This is unavoidable as aircraft must line up to<br>the numeay. The missed approach procedure   | Pown at optimum aircraft performance and<br>with continuous descent profile to minimize<br>noise. The procedure descent profile to minimize<br>of schools in the built-up areas of Warrington<br>and Rancon on final approach. The missed<br>approach procedure notes over Eartham<br>Country Parta and In the vicinity of a number of<br>schools in Bebrigton and Bristenhad at or<br>above 2.300 ft.  | Rejected at DPC/Dubly Assessment Stage  | minimise noise. The procedure overflies<br>residential areas of Warrington and Runcorn,<br>potentially in level flight at 2,000 ft. The miss<br>approach procedure overflies residential areas  | noise. The procedure lifes over, or close to, a<br>number of schools in residential areas of<br>Hexaell and Belington on final approach. The<br>wissed approach procedure routes in the<br>scholing of a number of schools in fluncom and<br>of Frieddaw, not below 3,500 ft. The MAP is an<br>emergency procedure rarely used so low<br>probability of noise impact for this element of<br>the procedure. This cipton is the hortest  | Flow at optimum allowing performance and<br>with contribution classification performance and<br>which contribution classification performance<br>another of classification performance and<br>mathematication and the second performance<br>mathematication performance and the<br>mathematication performance and the<br>mathematication performance and the<br>mathematication performance and the<br>performance and the second performance<br>mathematication performance and the<br>mathematication perfor | with continuo<br>noise.<br>However, this<br>number of sch<br>Heswall and B<br>il missed appros<br>st vicinity of a nu<br>areas in Runce                            |
|   |  |   |  |  |   |   |  |  |  |  |  |   |   |   |  |   | 4  |
| Communities                                     | Air Quality  | Initial Devices   | Most of the area another LLA is when an AM Cabin<br>Management is and USA and a margin the in-<br>any official strain and the strain and the strain and the<br>messare. A follow one 10 percent for generative<br>and the service-mercel strain and the strain and the<br>area official and LCC angle the test and any office<br>and another and the strain and the strain<br>and the service-mercel and and the strain<br>and the service-mercel and the strain<br>and the service-mercel and the strain<br>and the service-mercel and the strain<br>and strain and the strain and the strain<br>and strain and the strain and the strain<br>and strain and the strain and strain<br>and strain and strain and the strain and strain<br>and strain and strain and the strain and strain<br>and strain and strain and strain and strain and strain<br>and strain and strain and strain and strain and strain<br>and strain and strain and strain and strain and strain<br>and strain and strain and strain and strain and strain<br>and strain and strain and strain and strain and strain<br>and strain and strain and strain and strain an |  | No change to baseline   | No charge to busilite   | No charge to baseline  | No charge to bearing   | No charge to Saudine   | No change to baudine   | No charge to baseline  | No charge to baseline.  |   | No charge to baseline   | No charge to baseline  | No change to baseline   | No change to   |
| wider society                                   | impact   | Appraisal: Qualitative  | have the potential to minimise emissions through<br>optimum aircraft configuration (engine power<br>satting), use of contribuse climb/descent profiles,<br>utilization of thorests pactical nucles etc. In<br>general, the introduction of NNAV fight porcedures<br>is predicted to rotace environment allimpact over<br>extart ground/equipment based navigation<br>procedures.   | required to allow the improved descent profile<br>given the aircraft attribute at the beginning of<br>the Transition. Height restrictions as NRVB at<br>Geocordits from Manchester arrival and traffic<br>means the descent profile flown is not<br>optimum. This restriction is to comply with<br>FASI (Netrof) requirements.<br>Minimia emissions so far as is practicable<br>based on FASI (N) constraints. | (North) requirements.<br>Aircraft in decent with lower power settings.<br>Minimise emissions so far as is practicable<br>based on FASI (N) constraints.   | Manchester departures and hence the discuss<br>profile is not contourus, requiring an increase<br>engine power atting. This restriction is to<br>comply with FAS(IVent) requirements.<br>Alccaft in descent with lower power sattings.<br>Minimia emissions for as is practicable<br>based on FAS(IVI) constraints  | <ul> <li>continuous decorat profile. This roucing is<br/>required when Marchester Akport is operating<br/>on Rumay OS to deconflict with Manchester<br/>arrivale. The height reduction is to comply with<br/>FASI (North) requirements.</li> </ul>   | Represents solutions: user and mouth more DOUP, A<br>more direct tack conference to the direct the number of<br>tack ministry and the direct the number of<br>tack ministry and the direct of the anti-off direct<br>direct of the direct of the direct of the direct of<br>tack ministry and the direct of the direct of the<br>direct and direct on Safety.<br>Therefore ministry environments the direct one<br>of continuous descent and incorporating free<br>turns to reduce impact on safety.   | performance and minimises the track miles  | The proceeding incorporate a continuous<br>descent profila a polynomia aircraft<br>performance and minimise the took inlex<br>flow, Monimase initiations.  | s a génera sicolt performance and a to the<br>national procession took miles flow.   | The proceedure has been designed to be flown<br>at optimum aircraft professional and the optimum and the optimum aircraft profession of the optimum and the optim | i   | INVEG as an intermediate Fig. the increasing<br>the number of track interface. The two is and<br>the potential for aircraft to game demond<br>particles in low diright 2000. The other<br>approach (depending on clasmacci) lawding to<br>increased power strating, and granter<br>emissions. The mixed approach proorders<br>emissions. The mixed approach proorders<br>emissions. The mixed approach proorders<br>procedure automum engine power satting. | decisit profile, to be Rowan experiment arrows performance and expresents the more direct flight public performance and expresents the more direct flight public to the second performance and the second performance of the secon | coscer profile, to be flow at optimum aircrap<br>performance and presents the most direct<br>hight path.<br>The final and missional approach procedure<br>represents the minimum number of track hile<br>them and minimum similarity. The MAP and<br>emergency by acrossing procedure settlem and<br>bard by the state in environment procedure<br>power settling.  | aft descent porti<br>performance<br>fight path. Ti<br>routes the air<br>es approach pro<br>than the curn<br>of, emergency 'g<br>to but by its nat<br>power setting |
| Wider Society                                   | Capacity and<br>resilience   | Initial Options<br>Appraisal: Qualitative   | Generally, the introduction of PN is based on<br>delivering beneficia interms of increasing singace<br>capacity leading to more predictable moutes, levere<br>on ground and in air delays experienced by airlines.<br>The completion of the entire note from airport to<br>destination is relevant to a single methods and<br>structure. The implementation of PNN is currently<br>the highest priority for the global aviation<br>community.  | with the en-route structure.   | <ul> <li>The procedure has been designed to integrate<br/>with the en-route structure.</li> </ul>   | The procedure has been designed to integrate<br>with the en-route structure.  | The procedure has been designed to integrate with the en-route structure.  | The procedure has been designed to integrate<br>with the en-route structure.   | The procedure has been disigned to integrate with the en-route structure.  | The procedure has been designed to integrate<br>with the en-route structure.   | The procedure has been designed to integrate<br>with the en-route structure.   | The procedure has been designed to integrate<br>with the en-route structure.  |   | The procedure has been designed to integrate with the en-route structure.   | The procedure has been designed to integrate with the en-route structure.  | The procedure has been designed to integrate<br>with the en-route structure.  | The procedur<br>with the en-re   |
| General Aviation                                |  |   | Proceeding wholly contained within extant CAS; no<br>change to GA access to airspace. GA users of LLRA<br>will continue to arrive and dpart under extant<br>operational arrangements. Access to the runway<br>may be slightly improved via a reduction in on-<br>ground and in-air calorys brought about by the<br>introduction of PBN.  | Procedure wholly contrained within extant CAS<br>no change to GA access to airspace. GA users o<br>LLA will continue to arrive and depart under<br>extant operational arrangements.  | No charge to existing alreade arrangements<br>(procedure wathy contained within extrat CAS<br>of no change to GA access to aimpace. GA users<br>ULA will continue to arrive and depart under<br>extant operational arrangements.  | c: Procedure wholly contained within extant CAS,<br>of no change to GA access to airspace. GA users o<br>LLA will continue to arrive and depart under<br>extant operational arrangements.   | extant operational arrangements.   | extant operational arrangements.   | No charge to existing airpace arrangements:<br>Procesive which contained within examt CAS;<br>of no charge to GA access to airpace. GA users of<br>ULA will continue to arrive and depart under<br>extant operational arrangements.  | extant operational arrangements.   | extant operational arrangements.   | estant operational arrangements.  | a and a second se | extant operational arrangements.  | No change to existing alregace amagements<br>Procedure where constant within extra CAS<br>of no change to GA access to airgace. GA users o<br>ULA will continue to arrive and depart under<br>extant operational arrangements.   | extant operational arrangements.  | extant operat  |
| dana a Antonio<br>Commercial Julia              | / Economic impact<br>from increased<br>effective capacity<br>increased<br>effective capacity | mitua opotino<br>Appraiaa: Qualitative  | Servering here introduction of PRIs lases on<br>deleving eleving tax of fictorial agricultural<br>capacity helping to non-predictable models, here<br>represented the servering of the servering of the<br>capacity helping an matter being the servering the<br>capacity helping an matter being the servering the<br>capacity helping an matter being the servering the<br>capacity of the servering the servering the<br>capacity of the servering the servering the<br>servering the servering the servering the servering<br>section the servering the servering the servering<br>section the servering the servering the servering<br>section to servering the servering the servering<br>section to servering the servering the servering the<br>section to servering the servering the servering the servering<br>section to servering the servering the servering the servering the<br>section to servering the s   | increased effective capacity which is predicted<br>to have direct and indirect economic benefits   | <ul> <li>In the derivery of associated wateries including<br/>to morecast effective capacity which is practical<br/>to have direct and indirect commits, burdles<br/>the actives and general available.</li> </ul>  | In the define of associated benefits including<br>increased effective active plant (in particular<br>to have direct and indirect accounts benefits<br>for all these and general associate.  | This is a PMU/BWD procession and combinets<br>reconcilent and the procession of the procession of the<br>reconcered effective endoy which is predicted<br>to have direct and indirect exemonic burdles.<br>For all free and general advances   | In the definition of associated benefits is schedule<br>to concrease effective cargo value (is) produced<br>to have direct and indirect accounts benefits<br>for all time and general asiston.   | This is a PANURADA proceeding and contributions<br>to the order of a real and the short of the solution<br>to the order of the solution of the solution of the solution<br>to have diverse and indirect economic benefits<br>for address and general advation.                             | in the definer of associated works is schedule<br>increased effective scalar by which is protected<br>to have direct and inforces coronais benefits<br>for althous and general association.  | This is a PRVINN' procedure and contribute<br>to the delivery of acceled bandhis holding holding<br>to have denote and indexet economic bandhis<br>to have denote and indexet economic bandhis<br>for althree and general available.   | In the definery of an accessed services in schooling<br>increased effective accession, which is practical<br>to have direct and indirect economic levels<br>for all free and general available.   |   | to the delivery of associated henefits including  | In this a RMR/RMW procedure and contributes<br>to the default of cased and with schedure<br>to based for the schedure of the schedure<br>to based forsca and indirect economic benefits<br>for address and general aviation.   | to the delivery of associated benefits including  | g to the deliver<br>d increased eff  |
| General Aviation<br>commercial airlin           | es   |   | Each option has been assessed against other<br>options based on which any factors of the design<br>might contribute of MAV of one allowing the<br>associated predictability of tracks, continuous<br>commission and any second and the<br>predicted to result in reduced fuel burn versus the<br>baseline.   | performance minimises fuel burn for this<br>procedure.   | necessary height restrictions to coordinate with<br>Manchester any and comply with FASI (N)<br>constraints, optimum aircraft performance or<br>not be possible and increased fuel burn versus<br>other transitions.   | Most practical and expetitious route, however<br>continuous descent is limited by necessary<br>highly reservations load cample with FAG (N)<br>with the contraction of a simple with FAG (N)<br>with a simple simple simple simple simple simple simple<br>productions, optimum aircraft performance mus-<br>net be possible and increased flash burn versus<br>other transitions is predicted. | using numway QS; continuous descent is limited<br>by necessary height restrictions to coordinate<br>with Manchester and comply with FASI (N)<br>constraints, optimum aircraft performance ma<br>not be possible and increased fuel burn versus<br>other transitions is predicted.  | Most practical and expeditious route,<br>confinious descent, optimum aircraft<br>performance minimises fuel burn for this<br>procedure.  | Most practical and expeditions route,<br>continuous descent, optimum aircraft<br>performance minimises fuel burn for this<br>procedure.  | Most practical and expeditious route,<br>continuous descent, optimum aircraft<br>performance minimizes fuel burn for this<br>procedure.  | fuel burn.   | Flown at optimum aircraft performance and<br>with continuous discort profile to minimise<br>fuel born. Offers fewest possible track miles fo<br>27 Approach.  |   | Continuous deccent profile not always possible<br>due to conditiation with other airspace users<br>leading to increased fuel burn over other<br>options.  | <ul> <li>Flown at optimum aircraft performance and<br/>with continuous descent profile to minimise<br/>fuel burn.</li> </ul>   | fuel born.  | fuel burn. Rej<br>procedure.   |
| Commercial airlin                               | es Training costs  | Initial Options<br>Appraisal: Qualitative   | It is expected that PRA/Crew Forlang will be<br>required to enable plots to fight the new RMA<br>procedures. It is not proportionate for LLA's<br>assess training cost for individual commercial<br>adrises due to the significant variables involved eg-<br>number of plots reading training (non may<br>already be competent), waltables in plot<br>competence (LA how that saining be individual<br>will require), adrian packets on training is simulator<br>performance, availables in obacrd equipment and<br>already competence (LA how that is in plot<br>competence). The values is no based equipment and<br>already controls else.  | procedures. It is not proportionate for LLA to<br>assess training costs for individual commercial<br>airlines due to the significant variables involved<br>(see General Appraisal of PBN/RMAV)   | d airlines due to the significant variables involves<br>(see General Appraisal of PBN/REAV)   | procedens. It is not proportionate for LLA to<br>assess training costs for individual commercial<br>aritines due to the significant variables involved<br>(see General Appraial of PBA/IBNAV)   | procedurs. It is not proportionate for LLA to<br>sasses training costs for individual commercial<br>artines due to the significant variables involve<br>(see General Appraisal of PBN/RMAV)  |  | E is expected that Plac(Ceer Yaning will be<br>required to analysis to flight the new RNA<br>procedures. It is not proportionate for LLA to<br>assess training occurs for individual commercial<br>artifices due to the ageil(Cart wirlables involved<br>(see General Appraia) of PBN/RNA) |  |  | procedures. It is not proportionate for LILA to   | v<br>1  | assas training costs for individual commercia<br>arlines due to the significant warbibles involves<br>(see General Appraizal of PBN/RNAV)   | procedurs. II is ne proportionate for LLA to<br>suess training costs for inductado commercial<br>a artine: due to the significant variable: involve<br>(see General Appraical of PBN/RBNAV)  | asses training costs for individual commercial<br>a infines due to the significant utables involves<br>(see General Appraisal of PBN/RNAV)  | o procedures. I<br>al assess trainin<br>ed airlines due to<br>(see General.  |
| Commercial airlin<br>Airport / Air              |  | Initial Options<br>Appraisal: Qualitative<br>Initial Options                                      | Other costs to commercial attinuis may include<br>optimate to Fight Management Systems (FMS),<br>margistion databases and operating procedures,<br>increased gible in costs versus training etc. It is<br>not proportionate for LLA to assess the 'other<br>costs' to commercial aimins of high BNAV<br>procedures due to significant variables; some<br>attines may aimary to PBN ready whereas others<br>may not.  | navigation databases and operating<br>procedures; Increased pilot hite costs versus<br>training etc. It is not proportionate for LLA to<br>assess the 'other costs' to commercial airlines<br>of flying RNAV procedures due to significant<br>variables; some airlines may already be 'PBN<br>ready' whereas others may not.   | ready' whereas others may not.  | navigation databases and operating<br>procedures, increased pilot hiter costs versus<br>training etc. It is not proportionate for ULA to<br>assess the 'other costs' to commercial airlines<br>of fhying RNAV procedures due to significant<br>variables; some airlines may already be 'PBN<br>ready' whereas others may not.   | nevigation databases and operating<br>procedures, increased pilot hire costs versus<br>training etc. It is not proportionate for ULA to<br>assess the 'other costs' to commercial airlines<br>of thing RMAV procedures due to significant<br>variables; some airlines may already be 'PBN<br>ready' whereas others may not.    | navigation distabases and operating<br>procedures, increased pilot hire costs versus<br>training etc. It is not proportionate for LLA to<br>assess the 'other costs' to commercial airlines<br>of flying RNAP procedures due to significant<br>variables; some airlines may already be 'PBN<br>ready' whereas others may not.  | procedures, increased pilot hire costs versus<br>training etc. It is not proportionate for LIA to<br>assess the briter costs' to commercial airlines<br>of flying RNAV procedures due to significant<br>variables; some airlines may already be 'PBN<br>ready' whereas others may not.     | navigation databases and operating<br>procedures, increased pilot hire costs versus<br>training etc. It is not proportionate for LLA to<br>assess the 'other cost' to commercial airlines<br>of frijing RMV procedures due to significant<br>variables; some airlines may already be 'PBN<br>ready' whereas others may not.  | narigation distabases and operating<br>procedures, increased pilot hire costs versus<br>training etc. It is not proportionate for LLA to<br>assess the fother cost's to commercial airlines<br>of thing RNAP procedures due to significant<br>variables; some airlines may already be 'PBN<br>ready' whereas others may not. | navigation distabases and operating<br>procedures, increased pilot hire costs versus<br>training etc. It is not proportionate for LLA to<br>assess the fother cost's to commercial airlines<br>of fhying RNAP procedures due to significant<br>variables; some airlines may already be 'PEN<br>ready' whereas others may not.   |   | Other costs to commercial attriates may include<br>updates to Flight Management Systems (TMA<br>analyzion attabases and operating<br>procedures, increased pilot hive costs versus<br>rating etc. It is no proportionate for LLA to<br>assess the 'other costs' to commercial attrees<br>of hing RNAP resolutions data significant<br>variables; some airlines may already be 'PBN<br>ready' whereas others may not.  | assess the 'other costs' to commercial airlines<br>of flying RNAV procedures due to significant<br>variables; some airlines may already be 'PBN<br>ready' whereas others may not.  | procedures, increased pilot hire costs versus<br>training etc. It is not proportionate for LLA to<br>assess the 'other costs' to commercial airlines<br>of flying RNAV procedures due to significant<br>variables; some airlines may already be 'PBN<br>ready' whereas others may not.  | procedures, i<br>o training etc. I<br>s assess the 'ot<br>of flying RNA'<br>variables; sor<br>ready' where   |
| navigation servic                               | e costs  | Appraisal: Qualitative  | All options relate to the implementation of PRN and<br>on additional infrastructure is regular. The<br>introduction of PRN reduces the related on<br>infrastructure, in ganicular ground based<br>navigation aids are no longer medded. The<br>foundation for PRN area navigation of PRNV<br>aircraft anniving and disparing ULL using the<br>performance based navigation capability.   | ir   |   | Level Appraisal of PBN/RNAV.  | Level Appraisal of PEN/ROAV.   | Level Appraisal of PBN/RDAU.   | No additional infrastructure required (see High Level Appraisal of PBN/RNAV.   | Level Appraisal of PBN/RNAV.   | No additional infrastructure required (see High<br>Level Appraisal of PEN/INNV.  | No additional infrastructure required (see High<br>Level Appraisal of PBN/RBAV.   |   | No additional infrastructure required (see Hig<br>Level Appraisal of PBN/RMXV.  | No additional infrastructure reguled (see High<br>Level Appraisal of PBN/RDAV.   | No additional infrastructure required (see Hig<br>Level Appraisal of PEN/IDLAV.   | Level Apprais  |
| Airport / Air<br>navigation servici<br>provider | Operational cost   |   | CAO Iss: Improved Operational Efficiency as a<br>benefit delivered by the introduction of PRL in<br>general LLA predicts that operational efficiency will<br>improve and that there may be potential for a net<br>reduction in operational costs. It is expected that<br>any change in operational costs. We be the same<br>regardless of which option is chosen. This will be<br>considered further at Full Options Appraical stage.  | Operational Costs are not predicted to vary by<br>individual option.   | <ul> <li>Operational Costs are not predicted to vary by<br/>individual option.</li> </ul>   | Openational Costs are not predicted to very by<br>individual option.  | Operational Costs are not predicted to very by<br>individual option.   | Operational Costs are not predicted to vary by<br>individual option.   | Operational Costs are not predicted to vary by<br>individual option.   | Operational Costs are not predicted to vary by<br>individual option.   | Openational Costs are not predicted to very by<br>individual option.   | Operational Costs are not predicted to very by<br>individual option.  |   | Operational Costs are not predicted to vary by<br>individual option.  | Operational Costs are not predicted to vary by<br>individual option.   | Operational Costs are not predicted to vary by<br>individual option.  | Operational I<br>individual op   |
| Airport / Air<br>navigation service<br>provider | Deployment<br>costs  | Initial Options<br>Appraisal: Qualitative   | Delignment costs an attributable to the<br>introduction of PM/BMV proceedure ather than<br>the individual IP options thematives. Costs will<br>include ATCO instein and competence (based on<br>understanding airccitz) performance and ATC<br>procedures relative to PM/BM, and the end<br>documentation and procedures updates (e.g. MATS)<br>Procedure Validation and Simulator Costs].   | Deployment costs are not predicted to vary by<br>individual option.  | Poployment costs are not predicted to vary by<br>individual option.   | Deployment costs are not predicted to vary by<br>individual option.   | Deployment costs are not predicted to vary by<br>individual option.  | Deployment costs are not predicted to vary by<br>individual option.  | Deployment costs are not predicted to vary by<br>individual option.  | Deployment costs are not predicted to vary by<br>individual option.  | Deployment costs are not predicted to vary by<br>individual option.  | Deployment costs are not predicted to vary by<br>individual option.   |   | Deployment costs are not predicted to vary by<br>individual option.   | Deployment costs are not predicted to vary by<br>individual option.  | Deployment costs are not predicted to vary by<br>individual option.   | y Deployment<br>individual op  |
| Safety Assessmen                                | tt Safety<br>Assessment  | Initial Options<br>Appraisal: Qualitative   | improvement in safety and in fact ICOA declare it as   | managed through coordination with<br>Manchester ACP development.<br>Multiple aircraft at different speeds managed<br>tactically through vectoring, sequencing and  | Not Significant<br>Conflict with Manchester MIRSI hold to be<br>managed through coordination with<br>Marchotes ACP development.<br>Excitably through vectoring, anequencing and<br>hold procedures.<br>Conflict with SIDE managed by vertical<br>separation.  | Not Significant<br>Mullipla aircraft at different speeds managed<br>scatcally through wctoring, sequencing and<br>hold procedures.<br>Collicit with an and the Statific managed by<br>alternative Transition 27 VEGUN (CCDS)  | Not Significant<br>Adulps arrout at offerent speeds managed<br>soltandar through workning, sequencing and<br>hold procedure.<br>In the second second second second second<br>managed through coreclination. It was the Transition<br>only used when Manchester on 05.<br>Corrifics with 50c managed by vertical<br>separation. | Not Significant<br>Multiple aircraft at different speeds managed<br>scatcarly through wctoring, sequencing and<br>hot procedure.<br>In managed through coordination with<br>Marchards KOF Sevelopment.<br>Corrifers with new loft of the Spoprach mange<br>through altitude restrictions.  | Net Septificant<br>Multiple alreads at different speeds managed<br>tactically through exclusing, sequencing and<br>hold procedures.  | Not Significant<br>Mattpia alroath at different speeds managed<br>Excitally through wetching, sequencing and<br>hold procedures.   | Not Significant<br>NAP confict with other aircraft on 27<br>Approach managed by hold located at WAL<br>Confict with CAL toffic managed by<br>Care and the CAL toffic managed by<br>a pre-writing hazard, not unique to this<br>option).  | Not Significant<br>SAP conflict with other aircraft on 27<br>Approach managed by hold located at WAL<br>Conflict with CA1 coffic managed by<br>and the second second second filt<br>and a pre-weiting based, not unlike to this<br>option.<br>Conflict with transition procedures managed b<br>vertical separation.   | Unacceptable impact on Hawarden Argont.<br>MAP exits : Controlled Argona to the scort a<br>metric shared and XI/MAZ.<br>Subject of subject of the argonal score of a<br>subject of the subject of the score of the<br>containment of FPA's in Controlled Argonace (th<br>up a pre-exiting hazard, not unique to this<br>option).  | Not Significant<br>MAP conflict with other aircraft on 27<br>Approach managed by hold located at WAL.<br>Conflict with CA traffic managed by<br>the approaching based, not unlike the file<br>is approaching based, not unlike the file<br>is approaching based, not unlike the file<br>conflict with Manchester ACP<br>development.  | Not Significant<br>MAP confict with Manchester traffic managed<br>minorgic conduction with Manchester ACP<br>development.<br>6   | Not Sgolfcart<br>NAF confict with Manchester traffic manage<br>through coordination with Manchester KCP<br>development.   | Not Significar<br>d MAP conflict<br>through coon<br>development  |

| slaced by post engagement Approach 09<br>Option 3b with new hold over the sea   | Preferred by stakeholders following<br>amendment to the position and orientation of<br>the hold to keep aircraft over the sea<br>Post Engagement   |
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| each 09 Option 3<br>n at optimum aircraft performance and<br>continuous descent profile to minimise   | Post Engagement<br>Approach 09 Option 3b<br>Flown at optimum aircraft performance and<br>with continuous descent profile to minimise   |
| continued descent profile to minimie<br>of the descent profile to minimie<br>of characteristic and the descent<br>of the descent profile of the descent<br>descent profile of the descent profile<br>descent profile descent profile<br>descent profile descent profile descent profile descent<br>descent profile descent profile descent profile descent profile<br>descent profile descent  | endors: Through data and provides on monitoring<br>methods: Through and the second data and the<br>threads and additional and the second data and the<br>data and the second data and the second data and the<br>very second data and the second data and the<br>threads and the second data and the second data<br>were required, the second data and the second data<br>the second data and the second data and the<br>second data and the second data and the second<br>data and the second data and the second data and<br>the procedure to second second data and<br>the second data and the second data and the<br>the second data and the second data and the<br>data and the second data and the second data and<br>data and the second data and the second data and<br>the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and<br>data and the second data and the second data and the second data and<br>data and the second data and the second data and the second data and<br>data and data |
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| readouth vacageorates a continuous<br>exporting, too feedback and optimum account<br>mence and regregatests the most direct<br>path. The Matead Approach Proceeding<br>the aircraft back to the re-pin the<br>adv proceding which is a granter distance<br>the carrier hold. The MAP's an<br>adv proceeding which is a granter distance<br>the carrier hold. The MAP's an<br>adv proceeding which is a granter distance<br>the carrier hold. The MAP's and<br>the proceeding which is a granter distance<br>the carrier hold. The MAP's and<br>the proceeding which is a granter distance<br>the carrier hold. The MAP's and<br>the proceeding which is a granter distance<br>the carrier hold. The MAP's and<br>the proceeding which is a grant distance<br>the proceeding which is a grant distance<br>to the | The proceeding incorporates a continuous<br>descent profile, too from a cytotimum account<br>performance and represents the model funct<br>finge trach. The approximation proceeding<br>represents the minimum number of account in<br>a contrast of the minimum number of account<br>performance in the second second second second<br>performance in the second second second second<br>performance in the second second second<br>performance in the second second second<br>based on the second second second second<br>performance in the second second second second<br>performance in the second second second<br>performance in the second second second second second<br>performance in the second second second second second<br>performance in the second second second second second second<br>performance in the second second second second second second<br>performance in the second second second second second second second<br>performance in the second second second second second second second second<br>performance in the second                         |
| rocedure has been designed to integrate<br>the en-foute structure.  | No change to baseline  |
| ange to existing airspace arrangements.<br>dure wholly contained within extant CAS;<br>ange to GA access to airspace. GA surses of<br>will continue to arrive and depart under<br>t operational arrangements.   | No change to existing airspace arrangements:<br>Procedure wholly contained within extra CAS;<br>no change to GA access to airspace. GA users of<br>LILA. will continue to arrive and depart under<br>extant operational arrangements.  |
| 1.3 MW/MW/ prostature and controllators<br>delayed and structure and controllators used and<br>and affective reparate which is particular<br>and affective reparate which is particular<br>information of the structure and the structure<br>lines and general analysis.  | The is a FBV/HWV procedure and contribute<br>to the Allevy of autoritation benefits include<br>increased mit (FL) so expanding which is predicted<br>increased mit (FL) so expanding which is predicted<br>for all those and general aviation.   |
| i at optimum aircraft performance and<br>continuous descent profile to minimize<br>um. Represents shortext route for this<br>dure.  | Flow at optimum aircraft performance and<br>with continuous decemt profile to minimize<br>fael burn. Represents shortest noute for this<br>procedure athough possible increaded fael<br>burn for the mixed approach procedure to<br>mach new hold over the sait. The MAP is an<br>energiene power settings but it is typically ranely<br>used.   |
|   | It is expected that PRUCPer Training will be<br>required to enable biots flight the new RNAW<br>procedures. It is not proportionate for LLL as<br>assess training cost for individual commercial<br>alifines due to the significant variable: involved<br>(see General Appraisal of PBN/RNAV)  |
| atton database and operating<br>data. It is seen groups have been been to<br>data it is and provide the for that a<br>data it is and provide the seen at the<br>set of the top of the set of set of set<br>detareas of them any alreads to the<br>detareas of them any alreads to the<br>detareas of them any alreads to the<br>detareas of them any not.   | Other costs communical anteres may include<br>application to fight Mexicon of Sphark (Mexicon<br>Mexicon Control (Mexicon Mexicon)), and<br>productions, horizontal pilled his costs with<br>semantic states and the first costs with an<br>entrol of the semantic semantic semantic<br>of Regist Mexicon Section Section Section Section<br>(Register Section Section Section Section Section<br>(Register Section Section Section Section Section Section<br>Register Section Section Section Section Section Section<br>(Register Section Section Section Section Section Section<br>Register Section Section Section Section Section Section<br>(Register Section Section Section Section Section Section<br>Register Section Section Section Section Section Section<br>(Register Section Section Section Section Section Section Section<br>Register Section Section Section Section Section Section Section<br>(Register Section Sectio   |
| ational Costs are not predicted to vary by<br>dual option.  | Operational Costs are not predicted to vary by<br>individual option.   |
| yment costs are not predicted to vary by<br>dual option.  | Deployment costs are not predicted to vary by<br>individual option.  |
| ignificant<br>conflict with Manchester traffic managed<br>gh coordination with Manchester ACP<br>opment.  | Not Significant<br>New proposed hold conflicts with DIOUF 09<br>transition managed by altitude restrictions on<br>the transition.  |
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