INITIAL OPTIONS APPRAISAL

Issue 2

Summary of Analysis			The Do Nothing option represents the current situation where there is no airport at Manston, and no air traffic. The airport development can only proceed with approval of the DCO. Should the DCO not be approved and the development of Manston Airport is not able to proceed, this ACP will be withdrawn. An assumption is made that the airport consent leads to an introduction of a level of air traffic into the environment for which we must identify at least minimal safe operational procedures, hence this option is rejected.	The opening of the airport without any approved procedures or airspace raises significant safety concerns relating to conflict with gliders operating in Class G airspace for some overland departure directions. In addition, key outcomes of the Airspace Modernisation Strategy, specifically reducing emissions and better noise management, are unlikely to be met. Reliance on tactical vectoring from ATC would have an impact on both noise and emissions, specifically for overland routes.	Rejected - this option has minimal noise impact and represents the shortest track miles for aircraft routing to the north. However, conflict with other airports arrival routes would restrict climb profiles, increasing fuel burn and emissions.	Rejected - this option will have a slightly greater noise impact than the previous option. Very slightly longer than the previous option for aircraft routing to the north. Conflict with other airports arrival routes would restrict climb profiles, increasing fuel burn and emissions.	Rejected - greater noise impact than the previous options due to the proximity to a populated area. Longer than the previous option for aircraft routing to the north. Conflict with other airports arrival routes would restrict climb profiles, increasing fuel burn and emissions.	Rejected - this option has minimal noise impact however it represents increased track miles by slightly further right take-off. Proximity of this route to other airports arrival routes may restrict continuous climb operations, resulting in increased fuel burn and emissions.	Rejected - this option will have a slightly greater noise impact than the previous option. Very slightly longer than the previous option and proximity of this route to other airports arrival routes may restrict continuous climb operations, resulting in increased fuel burn and emissions.	Rejected - greater noise impact than the previous options due to the proximity to a populated area. Longer than the previous option and proximity of this route to other airports arrival routes may restrict continuous climb operations, resulting in increased fuel burn and emissions.	This option has minimal noise impact however, by turning right after take-off, this option will have greater track miles for some aircraft i.e. those routing to the south. Option will have to include a 'not above' height restriction, but once east of the arrival routes for other airports, aircraft will be able to perform continuous climb operations. this option represents the overall lowest noise impact for communities.	Rejected - this option will have a slightly greater noise impact than the previous option. Very slightly longer than the previous option. By turning right after take-off, this option will have greater track miles for some aircraft i.e. those routing to the south. Option will have to include a 'not above' height restriction, but once east of the arrival routes for other airports, aircraft will be able to perform continuous climb operations. Rejected in favour of lower noise impact of previous option.	Rejected - greater noise impact than the previous options due to the proximity to a populated area. Longer than the previous option. By turning right after take-off, this option will have greater track miles for some aircraft i.e. those routing to the south. Option will have to include a 'not above' height restriction, but once east of the arrival routes for other airports, aircraft will be able to perform continuous climb operations. Rejected in favour of lower noise impact of previous option.	Minimum practicable noise impact for Rwy 10 SID. Option allows for direct track and continuous climb operations, minimising fuel burn and emissions. Implementation of technical or operational mitigation required for the impact of wind turbine generator's on PSR.	Minimum practicable noise impact. Option allows for continuous climb operations, minimising fuel burn and emissions. Not the most direct track for aircraft routing south east, but procedure could be optimised to a more direct track therefore minimising track miles, fuel burn and emissions.
Group	**Impact**	**Level of Analysis**	**Do Nothing**	**SID Baseline (Do Minimum)**	**SID RWY 28 North (East) to North**	**SID RWY 28 North (Centre) to North**	**SID RWY 28 North (West) to North**	**SID RWY 28 North (East) to South**	**SID RWY 28 North (Centre) to South**	**SID RWY 28 North (West) to South**	**SID RWY 28 North (East) to East**	**SID RWY 28 North (Centre) to East**	**SID RWY 28 North (West) to East**	**SID RWY 10 North**	**SID RWY 10 South to East**
					Option 4	**Option 5**	**Option 6**	**Option 7**	**Option 8**	**Option 9**	**Option 10**	**Option 11**	**Option 12**	**Option 13**	**Option 14**
Communities	Noise impact on health and quality of life	Initial Options Appraisal: Qualitative	There is no change to the noise impact on health and the quality of life with the Do Nothing option.	In relation to noise management (below 7,000ft), this option provides little or no consistency of traffic distribution. As a result, aircraft routing will vary depending on the position of airway joining points, with an impact on both noise and number of people overflown below 7,000 ft. The likelihood of avoiding action in Class G airspace and delays in entry into Controlled Airspace and the airways structure are likely to have a further noise impact on local communities. The lack of predictable routing is likely to have an impact on tranquillity in the Kent Downs AONB from aircraft departing towards the south west. There is also likely to be an impact on locally identified areas of tranquillity, such as the Sandwich and Pegwell Bay National Nature Reserve.	This route is over a rural area of Kent and avoids large built-up areas and villages, although there are few small hamlets close to the route until the aircraft is over the sea. The remainder of this option tracks over the sea, resulting in minimal noise impact. Noise impact likely to be less than the Do Minimum option due to the predictable routing, avoiding towns and villages. This route avoids the majority of areas that are particularly sensitive to noise, although it does cross a narrow section of the Thanet Coast SSSI as it crosses the coast. This is likely to have less of an impact on tranquillity than the Do Minimum option. It is unlikely that the use of multiple routes to spread the noise burden more equitably could be used. There is not enough lateral separation of the routes overland to provide overflight respite without potentially increasing the noise impact on the built-up areas.	This route is over a rural area of Kent and avoids large built-up areas and villages, although it does come close to the village of St Nicholas-At-Wade. The remainder of this option tracks over the sea, resulting in minimal noise impact. Noise impact likely to be less than the Do Minimum option due to the predictable routing, avoiding towns and villages. This route avoids the majority of areas that are particularly sensitive to noise, although it does cross a narrow section of the Thanet Coast SSSI as it crosses the coast. This is likely to have less of an impact on tranquillity than the Do Minimum option. It is unlikely that the use of multiple routes to spread the noise burden more equitably could be used. There is not enough lateral separation of the routes overland to provide overflight respite without potentially increasing the noise impact on the built-up areas.	Although this route is over a rural area of Kent and avoids large built-up areas and villages, it is closer to the village of St Nicholas-At-Wade than the previous options, which will result in overflight of the village. The remainder of this option tracks over the sea, resulting in minimal noise impact. Noise impact likely to be less than the Do Minimum option due to the predictable routing, although there is likely to be an increased impact on the village of St Nicholas-At-Wade. This route avoids the majority of areas that are particularly sensitive to noise, although it does cross a narrow section of the Thanet Coast SSSI as it crosses the coast. This is likely to have less of an impact on tranquillity than the Do Minimum option. It is unlikely that the use of multiple routes to spread the noise burden more equitably could be used. 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It is unlikely that the use of multiple routes to spread the noise burden more equitably could be used. There is not enough lateral separation of the routes overland to provide overflight respite without potentially increasing the noise impact on the built-up areas.	Any departure from RWY 10 at Manston will have to fly over the town of Ramsgate as aircraft will not have achieved the minimum height required to initiate any turns. Noise impact will be the same as the Do Minimum option due to the location and proximity of Ramsgate in relation to the runway. This route avoids areas of tranquillity. In relation to Runway 10 departures only, this represents no change from the Do Minimum option.	Any departure from RWY 10 at Manston will have to fly over the town of Ramsgate as aircraft will not have achieved the minimum height required to initiate any turns. Noise impact will be the same as the Do Minimum option due to the location and proximity of Ramsgate in relation to the runway. This route avoids areas of tranquillity. In relation to Runway 10 departures only, this represents no change from the Do Minimum option.
Communities	Air Quality	Initial Options Appraisal: Qualitative	There is no change to the impact on Local Air Quality with the Do Nothing option.	Local Air Quality is likely to be affected by aircraft within 3 nautical miles of the airfield below 1,000 ft. The positions of aircraft below 1,000 ft are likely to be very similar (immediately after take-off, or on final approach) to the assessment conducted for the DCO and hence there should be no significant impact on air quality around the airport and specifically in the Thanet Urban AQMA as a result of implementing the Do Minimum option. The DCO Environmental Assessment concluded that there would be no significant impact on biodiversity as a result of the redevelopment of Manston Airport, despite the significant amount of ground-based infrastructure work that would be undertaken. Implementing the Do Minimum option can therefore be assumed to have no significant impact on biodiversity.	Local Air Quality is likely to be affected by aircraft within 3 nautical miles of the airfield below 1,000 ft. The positions of aircraft below 1,000 ft are likely to be very similar to the Do Minimum option. Aircraft departing from Runway 28 will be more concentrated on this single route, which may have a small localised negative impact on Local Air Quality. There will be no change in the Thanet Urban AQMA as a result of implementing this option. This option is not expected to result in any changes to biodiversity given that the implementation will not require any ground works to support implementation

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		Summary of Analysis	Minimum practicable noise impact on initial departure. Deconfliction from other airports arrival routes would height restrict aircraft, increasing noise impact and increasing fuel burn and emissions due to not being able to perform a continuous climb. Following discussions with NATS, this route could be amended to extend further south to avoid conflict with the arrival routes. This would allow aircraft to perform continuous climb operations above 7,000 ft oversea, mitigating the noise and emissions impact.	Reliance on tactical vectoring from ATC would have an impact on both noise and emissions, specifically for overland routes.	Direct track and oversea, minimum impact. Implementation of technical or operational mitigation required for the impact of wind turbine generator's on PSR.	Direct track and oversea, minimum impact.	Direct track and oversea, minimum impact.	Direct track and oversea, minimum impact.	Direct track and oversea, minimum impact.	Direct track and oversea, minimum impact. Further track miles to join the procedure for aircraft arriving from the west and south.	Designed to be flown at optimum aircraft performance in a continuous descent and minimal track miles. Will only be used when network traffic density is low to avoid confliction with outbound London TMA aircraft performing continuous climbs.	Direct track and oversea, although closer to the Southend CTA than the previous northern Transition. Further track miles to join the procedure for aircraft arriving from the west and south. Less attractive than Transition to 2,500 ft Approach due to proximity to Southend CTA.	Designed to be flown at optimum aircraft performance in a continuous descent and minimal track miles. Will only be used when network traffic density is low to avoid confliction with outbound London TMA aircraft performing continuous climbs.	Environmental impact due to unpredictable nature of approaches. Increased chance of a missed approach, with associated impact on noise, track miles, fuel burn and emissions.
Group	**Impact**	**Level of Analysis**	**SID RWY 10 South to West**	**Transition Baseline (Do Minimum)**	**Transition RWY 28 from North (JACKO)**	**Transition RWY 28 from North East (SUMUM)**	**Transition RWY 28 from East (RAPIX)**	**Transition RWY 28 from South East (KONAN)**	**Transition RWY 28 from South (OKVAP)**	**Transition RWY 10 from North to 2,500ft Approach**	**Transition RWY 10 from South to 2,500ft Approach (West)**	**Transition RWY 10 from North to 3,000ft Approach**	**Transition RWY 10 from South to 3,000ft Approach (West)**	**Approach Procedure Baseline (Do Minimum)**
			Option 15		**Option 16**	**Option 17**	**Option 18**	**Option 19**	**Option 20**	**Option 21**	**Option 23**	**Option 24**	**Option 26**	
Communities	Noise impact on health and quality of life	Initial Options Appraisal: Qualitative	Any departure from RWY 10 at Manston will have to fly over the town of Ramsgate as aircraft will not have achieved the minimum height required to initiate any turns. Noise impact will be the same as the Do Minimum option due to the location and proximity of Ramsgate in relation to the runway. As aircraft proceed on this SID, they may be required to remain at approximately 7,000ft until laterally separated to the west of arrival routes into London airports, with an associated noise impact on areas of south Kent, including Dover and Folkestone. Noise impact will be the same as the Do Minimum option as aircraft departing in this direction will have the same height restrictions. Aircraft may overfly the Kent Downs AONB whilst remaining at approximately 7,000 ft until laterally separated to the west of the London airport arrivals procedures, although this impact should be less than the Do Minimum option.	As this option would rely on tactical vectoring from ATC, there would be no consistency in terms of aircraft routing. As a result, aircraft routing will vary depending on the position of airway leaving point, with an associated impact on both noise and number of population overflown below 7,000 ft. There would be an increased likelihood of avoiding action required in Class G airspace. The lack of predictable routing is likely to have an impact on tranquillity in the Kent Downs AONB from aircraft arriving from the south west for approaches to Runway 10. There is also likely to be an impact on locally identified areas of tranquillity, such as the Sandwich and Pegwell Bay National Nature Reserve.	As this option is solely located over the sea, there is no implications in terms of noise impact on local communities or areas of tranquillity. This represents an improvement to the Do Minimum option.	As this option is solely located over the sea, there is no implications in terms of noise impact on local communities or areas of tranquillity. This represents an improvement to the Do Minimum option.	As this option is solely located over the sea, there is no implications in terms of noise impact on local communities or areas of tranquillity. This represents an improvement to the Do Minimum option.	As this option is solely located over the sea, there is no implications in terms of noise impact on local communities or areas of tranquillity. This represents an improvement to the Do Minimum option.	As this option is solely located over the sea, there is no implications in terms of noise impact on local communities or areas of tranquillity. This represents an improvement to the Do Minimum option.	As this option is solely located over the sea, there is no implications in terms of noise impact on local communities or areas of tranquillity. This represents an improvement to the Do Minimum option.	This option routes over rural areas, avoiding large built-up areas and villages. Lower aircraft power settings will be applicable at this stage as the aircraft is descending. Noise impact more concentrated than Do Minimum option due to predictable routing but should be less impact due to lower power settings in a continuous descent. Aircraft overfly the Kent Downs AONB in the descent to join the approach procedure. Aircraft should be above 4,000 ft whilst transiting across the AONB. This impact should be less than the Do Minimum option.	As this option is solely located over the sea, there is no implications in terms of noise impact on local communities or areas of tranquillity. This represents an improvement to the Do Minimum option.	This option routes over rural areas, avoiding large built-up areas and villages. Lower aircraft power settings will be applicable at this stage as the aircraft is descending. Noise impact more concentrated than Do Minimum option due to predictable routing but should be less impact due to lower power settings in a continuous descent. Aircraft overfly the Kent Downs AONB in the descent to join the approach procedure. Aircraft should be above 4,000 ft whilst transiting across the AONB. This impact should be less than the Do Minimum option.	Aircraft conducting visual approaches are more likely to follow different tracks over the ground producing a noise impact. Greater likelihood of an unstable approach and aircraft therefore needing to carry out a missed approach and conducting further approaches, with a further impact on noise. Greater likelihood of avoiding action in Class G airspace also likely to impact noise on local communities. There is also likely to be an impact on locally identified areas of tranquillity, such as the Sandwich and Pegwell Bay National Nature Reserve.
Communities	Air Quality	Initial Options Appraisal: Qualitative	Local Air Quality is likely to be affected by departing aircraft until above 1,000 ft. Aircraft flying this departure would be between 250 ft and 1,000 ft while passing over Ramsgate. As the aircraft has not reached a sufficient height to enable a turn at this point, overflying Ramsgate is unavoidable. No change to the Do Minimum option due to the location and proximity of Ramsgate in relation to the runway and hence no change in the Thanet Urban AQMA as a result of implementing this option. This option is not expected to result in any changes to biodiversity given that the implementation will not require any ground works to support implementation.	Local Air Quality is likely to be affected by aircraft below 1,000 ft. Aircraft will be above 1,000 ft during the transition to the approach, hence there will be no impact on air quality and no impact on the Thanet Urban AQMA. The DCO Environmental Assessment concluded that there would be no significant impact on biodiversity as a result of the redevelopment of Manston Airport, despite the significant amount of ground-based infrastructure work that would be undertaken. Implementing the Do Minimum option can therefore be assumed to have no significant impact on biodiversity.	Aircraft will be above 1,000 ft and remain over the sea at all times, hence there will be no impact on air quality or the Thanet Urban AQMA. This option will have no impact on biodiversity. No change to the Do Minimum option.	Aircraft will be above 1,000 ft and remain over the sea at all times, hence there will be no impact on air quality or the Thanet Urban AQMA. This option will have no impact on biodiversity. No change to the Do Minimum option.	Aircraft will be above 1,000 ft and remain over the sea at all times, hence there will be no impact on air quality or the Thanet Urban AQMA. This option will have no impact on biodiversity. No change to the Do Minimum option.	Aircraft will be above 1,000 ft and remain over the sea at all times, hence there will be no impact on air quality or the Thanet Urban AQMA. This option will have no impact on biodiversity. No change to the Do Minimum option.	Aircraft will be above 1,000 ft and remain over the sea at all times, hence there will be no impact on air quality or the Thanet Urban AQMA. This option will have no impact on biodiversity. No change to the Do Minimum option.	Aircraft will be above 1,000 ft and remain over the sea at all times, hence there will be no impact on air quality or the Thanet Urban AQMA. This option will have no impact on biodiversity. No change to the Do Minimum option.	Aircraft will be above 1,000 ft at all times, hence there will be no impact on air quality or the Thanet Urban AQMA. This option will have no impact on biodiversity. No change to the Do Minimum option.	Aircraft will be above 1,000 ft and remain over the sea at all times, hence there will be no impact on air quality or the Thanet Urban AQMA. This option will have no impact on biodiversity. No change to the Do Minimum option.	Aircraft will be above 1,000 ft at all times, hence there will be no impact on air quality or the Thanet Urban AQMA. This option will have no impact on biodiversity. No change to the Do Minimum option.	Local Air Quality is likely to be affected by aircraft within 3 nautical miles of the airfield below 1,000 ft. The positions of aircraft below 1,000 ft are likely to be very similar (immediately after take-off, or on final approach) to the assessment conducted for the DCO and hence there should be no significant impact on air quality around the airport and specifically in the Thanet Urban AQMA as a result of implementing the Do Minimum option. The DCO Environmental Assessment concluded that there would be no significant impact on biodiversity as a result of the redevelopment of Manston Airport, despite the significant amount of ground-based infrastructure work that would be undertaken. Implementing the Do Minimum option can therefore be assumed to have no significant impact on biodiversity.
Wider Society	Greenhouse Gas impact	Initial Options Appraisal: Qualitative	Aircraft will be able to perform optimum climb performance initially but aircraft will be required to remain at approximately 7,000 ft until laterally separated the west of arrival routes into London airports, resulting in greater fuel burn and pollution at lower altitudes. Likely to have similar impact to Do Minimum option due to inefficient climb profiles.	The lack of approved procedures do not support optimum aircraft performance and are therefore predicted to have an environmental impact in terms of emissions. Aircraft are unlikely to be able to perform continuous descent operations and routing is likely to require an increase in track miles at lower altitudes due to vectoring by ATC. This will mean higher engine power settings and greater track miles, impacting fuel burn and emissions. There is also the increased likelihood of avoiding action in relation to other airspace users operating in Class G airspace.	This procedure would incorporate a continuous descent profile at optimum aircraft performance and minimises the track miles flown, minimising emissions. More efficient profile should result in less impact than the Do Minimum option.	This procedure would incorporate a continuous descent profile at optimum aircraft performance and minimises the track miles flown, minimising emissions. More efficient profile should result in less impact than the Do Minimum option.	This procedure would incorporate a continuous descent profile at optimum aircraft performance and minimises the track miles flown, minimising emissions. More efficient profile should result in less impact than the Do Minimum option.	This procedure would incorporate a continuous descent profile at optimum aircraft performance and minimises the track miles flown, minimising emissions. More efficient profile should result in less impact than the Do Minimum option.	This procedure would incorporate a continuous descent profile at optimum aircraft performance and minimises the track miles flown, minimising emissions. More efficient profile should result in less impact than the Do Minimum option.	This procedure would incorporate a continuous descent profile at optimum aircraft performance. Although the Transition procedure itself minimises the number of track miles flown, for aircraft joining this procedure from the south, this is not the most direct routing and will increase the number of track miles flown and therefore additional fuel burn and emissions. More efficient profile should result in less impact than the Do Minimum option, although increased track miles for aircraft arriving from the south could result in greater impact.	This procedure would incorporate a continuous descent profile at optimum aircraft performance, although this would only be possible when network traffic density was low due to conflictions with traffic performing continuous climb operations outbound from the London TMA. This procedure represents the minimum track miles for aircraft arriving from the west. More efficient profile should result in less impact than the Do Minimum option.	This procedure would incorporate a continuous descent profile at optimum aircraft performance. Although the Transition procedure itself minimises the number of track miles flown, for aircraft joining this procedure from the south, this is not the most direct routing and will increase the number of track miles flown and therefore additional fuel burn and emissions. More efficient profile should result in less impact than the Do Minimum option, although increased track miles for aircraft arriving from the south could result in greater impact.	This procedure would incorporate a continuous descent profile at optimum aircraft performance, although this would only be possible when network traffic density was low due to conflictions with traffic performing continuous climb operations outbound from the London TMA. This procedure represents the minimum track miles for aircraft arriving from the west. More efficient profile should result in less impact than the Do Minimum option.	The lack of approved procedures do not support optimum aircraft performance and are therefore predicted to have an environmental impact. There is a likelihood of increased track mileage and the use of higher power settings and therefore impact on emissions. There is an increased likelihood of missed approaches leading to additional approaches and increased track miles and associated impact on emissions.
Wider Society	Capacity and resilience	Initial Options Appraisal: Qualitative	This option does support the management of capacity and resilience and was developed in coordination with NATS as part of FASI-S in accordance with the UK Airspace Modernisation Strategy. However, traffic would be subject to height restrictions until clear of London airport arrival routes.	This option is an ineffective way of managing airspace. Manston Airport would not meet the airspace modernisation priorities, including the coordination with other airspace users as part of the FASI-S programme. In poor weather conditions, there is a higher likelihood of aircraft having to carry out multiple approaches or divert to other airports with suitable approach aids, which will have a significant impact on the resilience of the airport.	This procedure has been designed in consultation with NATS and the FASI-S programme, in accordance with the UK Airspace Modernisation Strategy. This option enables a consistent approach to aircraft arriving from the airway system (via JACKO) from the north and north west. This enables increased capacity, efficiency and reduced track mileage.	This option will involve aircraft crossing into the LONDON FIR at SUMUM which is a boundary point widely used at the moment for arrivals into London airports. This route will increase airspace connectivity and capacity for aircraft arriving into Manston.	This option will involve aircraft crossing into the LONDON FIR from the adjacent FIR. This route will increase airspace connectivity and capacity for aircraft arriving into Manston transiting from the east.	This option will involve aircraft crossing into the LONDON FIR from the adjacent FIR (at KONAN). This route will increase airspace connectivity and capacity for aircraft arriving into Manston transiting from the east.	This procedure has been designed in consultation with NATS and the FASI-S programme, in accordance with the UK Airspace Modernisation Strategy. This option enables a consistent approach to aircraft arriving from the airway system from the south, This enables increased capacity, efficiency and reduced track mileage.	This procedure has been designed in consultation with NATS and the FASI-S programme, in accordance with the UK Airspace Modernisation Strategy. This option enables a consistent approach to aircraft arriving from the airway system from the north and east, This enables increased capacity, efficiency and reduced track mileage. Aircraft flying this option would initially fly on the London City Transition procedure and then join the Manston approach procedure.	This procedure has been designed in consultation with NATS and the FASI-S programme, in accordance with the UK Airspace Modernisation Strategy. This option enables a consistent approach to aircraft arriving from the airway system from the west, This enables increased capacity, efficiency and reduced track mileage.	This procedure has been designed in consultation with NATS and the FASI-S programme, in accordance with the UK Airspace Modernisation Strategy. This option enables a consistent approach to aircraft arriving from the airway system from the north and east, This enables increased capacity, efficiency and reduced track mileage. Aircraft flying this option would initially fly on the London City Transition procedure and then join the Manston approach procedure.	This procedure has been designed in consultation with NATS and the FASI-S programme, in accordance with the UK Airspace Modernisation Strategy. This option enables a consistent approach to aircraft arriving from the airway system from the west, This enables increased capacity, efficiency and reduced track mileage.	This option is an ineffective way of managing airspace. Manston Airport would not meet the airspace modernisation priorities, including the coordination with other airspace users as part of the FASI-S programme. In poor weather conditions, there is a higher likelihood of aircraft having to carry out multiple approaches or divert to other airports with suitable approach aids, which will have a significant impact on the resilience of the airport.
General Aviation	Access	Initial Options Appraisal: Qualitative	This route would have minimal impact on other airspace users. No change to airspace access is predicted.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted.
General Aviation / commercial airlines	Economic impact from increased effective capacity	Initial Options Appraisal: Qualitative	The introduction of PBN procedures coordinated with NATS and other FASI-S sponsors will contribute to the delivery of associated benefits including increased effective capacity which is predicted to have direct and indirect economic benefits associated with an increase in both air transport and GA movements.	The reopening of Manston Airport is expected to realise a positive economic impact with an increase in both air transport and GA movements from the current position of zero movements. Any impact as a result of operating the airport without approved procedures is likely to be a negative impact on the estimates above due to the increased likelihood of aircraft having to divert due to poor weather.	The introduction of PBN procedures coordinated with NATS and other FASI-S sponsors will contribute to the delivery of associated benefits including increased effective capacity which is predicted to have direct and indirect economic benefits associated with an increase in both air transport and GA movements.	The introduction of PBN procedures coordinated with NATS and other FASI-S sponsors will contribute to the delivery of associated benefits including increased effective capacity which is predicted to have direct and indirect economic benefits associated with an increase in both air transport and GA movements.	The introduction of PBN procedures coordinated with NATS and other FASI-S sponsors will contribute to the delivery of associated benefits including increased effective capacity which is predicted to have direct and indirect economic benefits associated with an increase in both air transport and GA movements.	The introduction of PBN procedures coordinated with NATS and other FASI-S sponsors will contribute to the delivery of associated benefits including increased effective capacity which is predicted to have direct and indirect economic benefits associated with an increase in both air transport and GA movements.	The introduction of PBN procedures coordinated with NATS and other FASI-S sponsors will contribute to the delivery of associated benefits including increased effective capacity which is predicted to have direct and indirect economic benefits associated with an increase in both air transport and GA movements.	The introduction of PBN procedures coordinated with NATS and other FASI-S sponsors will contribute to the delivery of associated benefits including increased effective capacity which is predicted to have direct and indirect economic benefits associated with an increase in both air transport and GA movements.	The introduction of PBN procedures coordinated with NATS and other FASI-S sponsors will contribute to the delivery of associated benefits including increased effective capacity which is predicted to have direct and indirect economic benefits associated with an increase in both air transport and GA movements.	The introduction of PBN procedures coordinated with NATS and other FASI-S sponsors will contribute to the delivery of associated benefits including increased effective capacity which is predicted to have direct and indirect economic benefits associated with an increase in both air transport and GA movements.	The introduction of PBN procedures coordinated with NATS and other FASI-S sponsors will contribute to the delivery of associated benefits including increased effective capacity which is predicted to have direct and indirect economic benefits associated with an increase in both air transport and GA movements.	The reopening of Manston Airport is expected to realise a positive economic impact with an increase in both air transport and GA movements from the current position of zero movements. Any impact as a result of operating the airport without approved procedures is likely to be a negative impact on the estimates above due to the increased likelihood of aircraft having to divert due to poor weather.
General Aviation / commercial airlines	Fuel burn	Initial Options Appraisal: Qualitative	Aircraft will be able to perform optimum climb performance initially but aircraft will be required to remain at approximately 7,000ft until laterally separated the west of arrival routes into London airports, resulting in greater fuel burn. Likely to have similar impact to Do Minimum option due to inefficient climb profiles.	There will be an impact on fuel burn due to unpredictable routes due to variation in airways leaving positions and tactical ATC intervention and the opportunity to optimise aircraft performance through continuous descent operations unlikely to be achieved.	Most practical and expeditious route, continuous descent at optimum aircraft performance therefore minimises fuel burn for this procedure. Less impact than the Do Minimum option.	Most practical and expeditious route, continuous descent at optimum aircraft performance therefore minimises fuel burn for this procedure. Less impact than the Do Minimum option.	Most practical and expeditious route, continuous descent at optimum aircraft performance therefore minimises fuel burn for this procedure. Less impact than the Do Minimum option.	Most practical and expeditious route, continuous descent at optimum aircraft performance therefore minimises fuel burn for this procedure. Less impact than the Do Minimum option.	Most practical and expeditious route, continuous descent at optimum aircraft performance therefore minimises fuel burn for this procedure. Less impact than the Do Minimum option.	Most practical and expeditious route, continuous descent at optimum aircraft performance therefore minimises fuel burn for this procedure. Additional track milage and therefore fuel burn will be incurred by aircraft joining from the south. More efficient profile should result in less impact than the Do Minimum option, although increased track miles for aircraft arriving from the south could result in greater impact.	Most practical and expeditious route, continuous descent at optimum aircraft performance therefore minimises fuel burn for this procedure. Less impact than the Do Minimum option.	Most practical and expeditious route, continuous descent at optimum aircraft performance therefore minimises fuel burn for this procedure. Additional track milage and therefore fuel burn will be incurred by aircraft joining from the south. More efficient profile should result in less impact than the Do Minimum option, although increased track miles for aircraft arriving from the south could result in greater impact.	Most practical and expeditious route, continuous descent at optimum aircraft performance therefore minimises fuel burn for this procedure. Less impact than the Do Minimum option.	There will be an impact on fuel burn due to unpredictable routes due to ATC vectoring. There is an increased likelihood of missed approaches leading to additional approaches and increased track miles and hence associated impact on fuel burn.
Commercial airlines	Training costs	Initial Options Appraisal: Qualitative	There will be no additional training costs required for commercial operators flying PBN routes or procedures.	There will be no additional training costs associated with implementing the Do Minimum option over and above the training costs associated with the reopening Manston Airport as a NSIP. No additional training would be required by commercial airlines or GA as a result of reopening the airport without any approved procedures.	There will be no additional training costs required for commercial operators flying PBN routes or procedures.	There will be no additional training costs required for commercial operators flying PBN routes or procedures.	There will be no additional training costs required for commercial operators flying PBN routes or procedures.	There will be no additional training costs required for commercial operators flying PBN routes or procedures.	There will be no additional training costs required for commercial operators flying PBN routes or procedures.	There will be no additional training costs required for commercial operators flying PBN routes or procedures.	There will be no additional training costs required for commercial operators flying PBN routes or procedures.	There will be no additional training costs required for commercial operators flying PBN routes or procedures.	There will be no additional training costs required for commercial operators flying PBN routes or procedures.	There will be no additional training costs associated with implementing the Do Minimum option over and above the training costs associated with the reopening Manston Airport as a NSIP. No additional training would be required by commercial airlines or GA as a result of reopening the airport without any approved procedures.
Commercial airlines	Other costs	Initial Options Appraisal: Qualitative	The availability of approved procedures should lead to fewer minima related diversions and associated costs. Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Any additional costs are likely to be less than those associated with the Do Minimum option.	The lack of approved procedures should not result in any other additional costs for commercial airlines.	The availability of approved procedures should lead to fewer minima related diversions and associated costs. Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Any additional costs are likely to be less than those associated with the Do Minimum option.	The availability of approved procedures should lead to fewer minima related diversions and associated costs. Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Any additional costs are likely to be less than those associated with the Do Minimum option.	The availability of approved procedures should lead to fewer minima related diversions and associated costs. Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Any additional costs are likely to be less than those associated with the Do Minimum option.	The availability of approved procedures should lead to fewer minima related diversions and associated costs. Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Any additional costs are likely to be less than those associated with the Do Minimum option.	The availability of approved procedures should lead to fewer minima related diversions and associated costs. Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Any additional costs are likely to be less than those associated with the Do Minimum option.	The availability of approved procedures should lead to fewer minima related diversions and associated costs. Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Any additional costs are likely to be less than those associated with the Do Minimum option.	The availability of approved procedures should lead to fewer minima related diversions and associated costs. Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Any additional costs are likely to be less than those associated with the Do Minimum option.	The availability of approved procedures should lead to fewer minima related diversions and associated costs. Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Any additional costs are likely to be less than those associated with the Do Minimum option.	The availability of approved procedures should lead to fewer minima related diversions and associated costs. Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Any additional costs are likely to be less than those associated with the Do Minimum option.	The lack of approved procedures, specifically Instrument Approach Procedures could lead to an increased cost to commercial airlines due to the higher likelihood of aircraft being unable to land at Manston Airport due to poor weather. Extra costs would include additional fuel usage during diversion to alternate airports, additional airport fees, time and fuel to return to Manston Airport or ground transport costs for moving cargo from an alternate location.
Airport / Air navigation service provider	Infrastructure costs	Initial Options Appraisal: Qualitative	There will be no additional infrastructure costs associated with the introduction of PBN routes or procedures. No change from the Do Minimum option.	There are no additional infrastructure costs associated with the Do Minimum option as a direct result of this ACP over and above the costs of reopening Manston Airport as a NSIP.	There will be no additional infrastructure costs associated with the introduction of PBN routes or procedures. No change from the Do Minimum option.	There will be no additional infrastructure costs associated with the introduction of PBN routes or procedures. No change from the Do Minimum option.	There will be no additional infrastructure costs associated with the introduction of PBN routes or procedures. No change from the Do Minimum option.	There will be no additional infrastructure costs associated with the introduction of PBN routes or procedures. No change from the Do Minimum option.	There will be no additional infrastructure costs associated with the introduction of PBN routes or procedures. No change from the Do Minimum option.	There will be no additional infrastructure costs associated with the introduction of PBN routes or procedures. No change from the Do Minimum option.	There will be no additional infrastructure costs associated with the introduction of PBN routes or procedures. No change from the Do Minimum option.	There will be no additional infrastructure costs associated with the introduction of PBN routes or procedures. No change from the Do Minimum option.	There will be no additional infrastructure costs associated with the introduction of PBN routes or procedures. No change from the Do Minimum option.	There are no additional infrastructure costs associated with the Do Minimum option as a direct result of this ACP over and above the costs of reopening Manston Airport as a NSIP.
Airport / Air navigation service provider	Operational costs	Initial Options Appraisal: Qualitative	The operational costs associated with implementing PBN procedures relate to IFP design, validation (ground and airborne), safety assessment, airspace change and consultation, certification and publication. Once implemented, the costs of ownership of PBN procedures is very low, requiring maintenance of the procedure on a five yearly basis.	There will be no additional routine operational costs associated with implementing the Do Minimum option over and above the operational costs of reopening Manston Airport as a NSIP.	The operational costs associated with implementing PBN procedures relate to IFP design, validation (ground and airborne), safety assessment, airspace change and consultation, certification and publication. Once implemented, the costs of ownership of PBN procedures is very low, requiring maintenance of the procedure on a five yearly basis.	The operational costs associated with implementing PBN procedures relate to IFP design, validation (ground and airborne), safety assessment, airspace change and consultation, certification and publication. Once implemented, the costs of ownership of PBN procedures is very low, requiring maintenance of the procedure on a five yearly basis.	The operational costs associated with implementing PBN procedures relate to IFP design, validation (ground and airborne), safety assessment, airspace change and consultation, certification and publication. Once implemented, the costs of ownership of PBN procedures is very low, requiring maintenance of the procedure on a five yearly basis.	The operational costs associated with implementing PBN procedures relate to IFP design, validation (ground and airborne), safety assessment, airspace change and consultation, certification and publication. Once implemented, the costs of ownership of PBN procedures is very low, requiring maintenance of the procedure on a five yearly basis.	The operational costs associated with implementing PBN procedures relate to IFP design, validation (ground and airborne), safety assessment, airspace change and consultation, certification and publication. Once implemented, the costs of ownership of PBN procedures is very low, requiring maintenance of the procedure on a five yearly basis.	The operational costs associated with implementing PBN procedures relate to IFP design, validation (ground and airborne), safety assessment, airspace change and consultation, certification and publication. Once implemented, the costs of ownership of PBN procedures is very low, requiring maintenance of the procedure on a five yearly basis.	The operational costs associated with implementing PBN procedures relate to IFP design, validation (ground and airborne), safety assessment, airspace change and consultation, certification and publication. Once implemented, the costs of ownership of PBN procedures is very low, requiring maintenance of the procedure on a five yearly basis.	The operational costs associated with implementing PBN procedures relate to IFP design, validation (ground and airborne), safety assessment, airspace change and consultation, certification and publication. Once implemented, the costs of ownership of PBN procedures is very low, requiring maintenance of the procedure on a five yearly basis.	The operational costs associated with implementing PBN procedures relate to IFP design, validation (ground and airborne), safety assessment, airspace change and consultation, certification and publication. Once implemented, the costs of ownership of PBN procedures is very low, requiring maintenance of the procedure on a five yearly basis.	There will be no additional routine operational costs associated with implementing the Do Minimum option over and above the operational costs of reopening Manston Airport as a NSIP. However, the increased likelihood of aircraft needing to divert due to poor weather at Manston Airport may induce increased operational costs at the airport.
Airport / Air navigation service provider	Deployment costs	Initial Options Appraisal: Qualitative	There will be no additional deployment costs associated with the introduction of PBN procedures. No change from the Do Minimum option.	There will be no additional deployment costs associated with implementing the Do Minimum option over and above the operational costs of reopening Manston Airport as a NSIP.	There will be no additional deployment costs associated with the introduction of PBN procedures. No change from the Do Minimum option.	There will be no additional deployment costs associated with the introduction of PBN procedures. No change from the Do Minimum option.	There will be no additional deployment costs associated with the introduction of PBN procedures. No change from the Do Minimum option.	There will be no additional deployment costs associated with the introduction of PBN procedures. No change from the Do Minimum option.	There will be no additional deployment costs associated with the introduction of PBN procedures. No change from the Do Minimum option.	There will be no additional deployment costs associated with the introduction of PBN procedures. No change from the Do Minimum option.	There will be no additional deployment costs associated with the introduction of PBN procedures. No change from the Do Minimum option.	There will be no additional deployment costs associated with the introduction of PBN procedures. No change from the Do Minimum option.	There will be no additional deployment costs associated with the introduction of PBN procedures. No change from the Do Minimum option.	There will be no additional deployment costs associated with implementing the Do Minimum option over and above the operational costs of reopening Manston Airport as a NSIP.
Safety Assessment	Safety Assessment	Initial Options Appraisal: Qualitative	No significant safety implications were identified during the safety assessment. Departing aircraft will require an air traffic service to be provided by Manston ATC for separation with other traffic. Potential conflict between departing aircraft and traffic arriving at other London airports in the vicinity of DVR VOR. Mitigated by height restrictions on the Manston departure procedures to ensure departing traffic remains below arrivals traffic.	No significant safety implications were identified during the safety assessment.	No significant safety implications were identified during the safety assessment. Potential loss of aircraft identification in Windfarm clutter, requiring implementation of technical or operational mitigation for the impact of wind turbine generator's on PSR.	No significant safety implications were identified during the safety assessment.	No significant safety implications were identified during the safety assessment.	No significant safety implications were identified during the safety assessment.	No significant safety implications were identified during the safety assessment.	No significant safety implications were identified during the safety assessment. The procedure is close to the current and proposed Southend CTAs.	No significant safety implications were identified during the safety assessment. The procedure is close to the Southend CTA.	No significant safety implications were identified during the safety assessment. The procedure is close to the current and proposed Southend CTAs.	No significant safety implications were identified during the safety assessment. The procedure is close to the Southend CTA.	No significant safety implications were identified during the safety assessment.

INITIAL OPTIONS APPRAISAL

		Summary of Analysis	Minimum practicable impact from approach. MAP represents the minimum practicable track miles, minimising noise impact with most of the procedure over the sea. Potential to move the Hold position away from the Windfarm whilst remaining over the sea.	Rejected - Minimum practicable impact from approach. Missed approach has greater noise impact than the previous option due to proximity to populated area. Longer MAP option, although most of the procedure is over the sea. Potential to move the Hold position away from the Windfarm whilst remaining over the sea. Rejected in favour of lower noise impact of previous option.	Minimum noise impact and minimum track miles, reducing emissions. Safety assessment concerns mitigated.	Minimum noise impact and minimum track miles, reducing emissions. Safety assessment concerns mitigated.	Aircraft will be required to hold VFR away from the airport, with associated noise impact in the local area. Aircraft will hold for the minimum amount of time, impacting emissions. Should the airport decide not to install an NDB, GA aircraft will be required to hold VFR away from the airport, hence this option is taken forward.	Rejected - greater noise impact than the south west option.	Rejected - greater noise impact than the south west option.	Hold situated over rural areas avoiding towns and villages, minimising noise impact. Hold will not be used when commercial aircraft are inbound on an approach procedure due to possible conflict with the MAP.	Does not allow for any protection of aircraft during the critical stages of flight.	Minimum impact on noise and emissions, other than minor redistribution of existing GA traffic. Provides protection of aircraft during critical stages of flight when arriving, departing or flying in the vicinity of the airport.
Group	**Impact**	**Level of Analysis**	**RWY 28 ILS/RNAV MAP North (East)**	**RWY 28 ILS/RNAV MAP North (West)**	**RWY 10 ILS/RNAV 2,500ft Approach MAP North**	**RWY 10 ILS/RNAV 3,000ft Approach MAP North**	**NDB Hold Baseline (Do Minimum)**	**NDB Hold North East**	**NDB Hold North West**	**NDB Hold South West**	**Regulated Airspace (Do Minimum)**	**Aerodrome Traffic Zone (ATZ)**
			Option 27	**Option 28**	**Option 30**	**Option 32**		**Option 34**	**Option 35**	**Option 36**		**Option 37**
Communities	Noise impact on health and quality of life	Initial Options Appraisal: Qualitative	The initial part of this proposed procedure is over the sea, so does not affect any communities. Aircraft will have to overfly Ramsgate, located only 2.3 nautical miles from touchdown, making it unavoidable. The MAP is over a rural area of Kent and avoids large built-up areas and villages, following the shortest route to the coast, after which, aircraft will remain over the sea. This will have a limited noise impact on local communities in terms of noise until the aircraft is back out over the sea. No change to the noise impact of the approach due to the location and proximity of Ramsgate to the runway. Noise impact of MAP more concentrated than the Do Minimum option but less likely to occur due to improved minima of an approved procedure. This route avoids the majority of areas that are particularly sensitive to noise, although the MAP crosses a narrow section of the Thanet Coast SSSI as it crosses the coast. This is likely to have less of an impact on tranquillity than the Do Minimum option.	The initial part of this proposed procedure is over the sea, so does not affect any communities. Aircraft will have to overfly Ramsgate, located only 2.3 nautical miles from touchdown, making it unavoidable. The MAP is over a rural area of Kent and avoids large built-up areas and villages, although it does fly closer to the village of St Nicholas-At-Wade (compared to the previous option). This will have a limited noise impact on local communities in terms of noise until the aircraft is back out over the sea. No change to the noise impact of the approach due to the location and proximity of Ramsgate to the runway. Noise impact of MAP more concentrated than the Do Minimum option but less likely to occur due to improved minima of an approved procedure. This route avoids the majority of areas that are particularly sensitive to noise, although the MAP crosses a narrow section of the Thanet Coast SSSI as it crosses the coast. This is likely to have less of an impact on tranquillity than the Do Minimum option.	The Initial Approach segments are either over the sea, or over rural areas, avoiding large built-up areas and villages. The Intermediate and Final Approach segments are unable to avoid the town of Herne Bay due to the location and orientation of the runway. The MAP goes over the town of Ramsgate, which is unavoidable due to the location. Noise impact likely to be greater than the Do Minimum option due to the design requirements of an IFP with more concentration further from the runway. This route avoids areas that are particularly sensitive to noise, hence this is likely to have less of an impact on tranquillity than the Do Minimum option.	The Initial Approach segments are either over the sea, or over rural areas, avoiding large built-up areas and villages. The Intermediate and Final Approach segments are unable to avoid the town of Herne Bay due to the location and orientation of the runway. The MAP goes over the town of Ramsgate, which is unavoidable due to the location. Noise impact likely to be greater than the Do Minimum option due to the design requirements of an IFP with more concentration further from the runway. This route avoids areas that are particularly sensitive to noise, hence this is likely to have less of an impact on tranquillity than the Do Minimum option.	With this option, GA aircraft will be required to hold away from the airport but in no specific location. The position will be determined by the aircraft captain operating VFR in Class G airspace. Aircraft could even be as low as 500ft, affecting noise levels over the surrounding areas. There is also likely to be an impact on locally identified areas of tranquillity, such as the Sandwich and Pegwell Bay National Nature Reserve and the Thanet Coast and Sandwich Bay SPA.	For this option, aircraft would be required to hold over Ramsgate and Broadstairs (including the turning portion of the hold) meaning that noise impacts will be significantly increased. This option is also in close proximity to various schools and care homes. Greater noise impact than the Do Minimum option. This route avoids areas that are particularly sensitive to noise, hence this is likely to have less of an impact on tranquillity than the Do Minimum option.	For this option, aircraft would be required to hold over the outskirts of Birchington meaning that noise impacts will be significantly increased. Other than Birchington, the remainder of this hold flies over rural areas, avoiding towns and villages. Greater noise impact than the Do Minimum option. This route avoids areas that are particularly sensitive to noise, hence this is likely to have less of an impact on tranquillity than the Do Minimum option.	For this option, aircraft would hold over rural areas, avoiding towns and villages, although aircraft would be close to the villages of Cliffs End, Minster and Monkton. Compared to the previous two options, this proposed option impacts less communities in terms of noise. Noise impact will be more concentrated but over a rural area so likely to be less people affected than the Do Minimum option.	Without any regulated airspace, there is an increased likelihood of aircraft requiring avoidance action which will have an impact on noise in the area around the airport. There will be no impact on areas of tranquillity.	The introduction of an ATZ will have a minimal impact in terms of noise, other than the redistribution of existing GA traffic, but overflight of noise sensitive areas will be kept to a minimum. May result in redistribution of noise impact than the Do Minimum option with different rather than more population affected.
Communities	Air Quality	Initial Options Appraisal: Qualitative	Local Air Quality is likely to be affected by aircraft within 3 nautical miles of the airfield below 1,000 ft. Ramsgate is only 2.3 nautical miles from touchdown, so overflight below 1,000 ft is unavoidable. However, the positions of aircraft below 1,000 ft are likely to be very similar to the Do Minimum option. No change to the Do Minimum option due to the location and proximity of Ramsgate in relation to the runway and hence no change in the Thanet Urban AQMA as a result of implementing this option. Aircraft less likely to carry out a MAP which should mean less impact than the Do Minimum option. This option is not expected to result in any changes to biodiversity given that the implementation will not require any ground works to support implementation.	Local Air Quality is likely to be affected by aircraft within 3 nautical miles of the airfield below 1,000 ft. Ramsgate is only 2.3 nautical miles from touchdown, so overflight below 1,000 ft is unavoidable. However, the positions of aircraft below 1,000 ft are likely to be very similar to the Do Minimum option. No change to the Do Minimum option due to the location and proximity of Ramsgate in relation to the runway and hence no change in the Thanet Urban AQMA as a result of implementing this option. The MAP is closer to the village of St Nicholas-At-Wade than the previous option, but aircraft less likely to carry out a MAP which should mean less impact than the Do Minimum option. This option is not expected to result in any changes to biodiversity given that the implementation will not require any ground works to support implementation.	Local Air Quality is likely to be affected by aircraft within 3 nautical miles of the airfield below 1,000 ft. The positions of aircraft below 1,000 ft are likely to be very similar to the Do Minimum option and hence there should be no change in the impact on air quality around the airport and specifically in the Thanet Urban AQMA as a result of implementing the Do Minimum option. This option is not expected to result in any changes to biodiversity given that the implementation will not require any ground works to support implementation.	Local Air Quality is likely to be affected by aircraft within 3 nautical miles of the airfield below 1,000 ft. The positions of aircraft below 1,000 ft are likely to be very similar to the Do Minimum option and hence there should be no change in the impact on air quality around the airport and specifically in the Thanet Urban AQMA as a result of implementing the Do Minimum option. This option is not expected to result in any changes to biodiversity given that the implementation will not require any ground works to support implementation.	Aircraft will generally hold above 1,000 ft so will have no impact on Local Air Quality. However, aircraft operating VFR could hold at altitudes as low as 500 ft. The assessment conducted for the DCO included GA aircraft and hence there should be no significant impact on air quality around the airport and specifically in the Thanet Urban AQMA as a result of implementing the Do Minimum option. The DCO Environmental Assessment concluded that there would be no significant impact on biodiversity as a result of the redevelopment of Manston Airport, despite the significant amount of ground-based infrastructure work that would be undertaken. Implementing this option can therefore be assumed to have no significant impact on biodiversity.	The hold will be flown at 2,000 ft so there will be no impact on the Local Air Quality and specifically in the Thanet Urban AQMA No change to the Do Minimum option. This option is not expected to result in any changes to biodiversity. No change to the Do Minimum option.	The hold will be flown at 2,000 ft so there will be no impact on the Local Air Quality and specifically in the Thanet Urban AQMA No change to the Do Minimum option. This option is not expected to result in any changes to biodiversity. No change to the Do Minimum option.	The hold will be flown at 2,000 ft so there will be no impact on the Local Air Quality and specifically in the Thanet Urban AQMA No change to the Do Minimum option. This option is not expected to result in any changes to biodiversity. No change to the Do Minimum option.	The assessment conducted for the DCO concluded that there should be no significant impact on air quality around the airport and specifically in the Thanet Urban AQMA, hence there should be no significant impact on air quality as a result of implementing the Do Minimum option. The Do Minimum option will have no impact on biodiversity.	The implementation of an ATZ is not expected to have any impact on local air quality. No change from the Do Minimum option. This option will have no impact on biodiversity.
Wider Society	Greenhouse Gas impact	Initial Options Appraisal: Qualitative	The procedure incorporates a continuous descent profile, to be flown at optimum aircraft performance and represents the most direct flight path, minimising track miles and emissions. The MAP represents the minimum practicable track miles flown. The MAP is an emergency procedure seldom used, but by its nature may require maximum engine power setting. More efficient profile should result in less impact than the Do Minimum option.	The procedure incorporates a continuous descent profile, to be flown at optimum aircraft performance and represents the most direct flight path, minimising track miles and emissions. The MAP is slightly longer than the previous option. The MAP is an emergency procedure seldom used, but by its nature may require maximum engine power setting. More efficient profile should result in less impact than the Do Minimum option.	The procedure incorporates a continuous descent profile, to be flown at optimum aircraft performance and represents the most direct flight path, minimising track miles and emissions. The Missed Approach Procedure represents the minimum practicable track miles flown. The MAP is an emergency procedure seldom used, but by its nature may require maximum engine power setting. More efficient profile should result in less impact than the Do Minimum option.	The procedure incorporates a continuous descent profile, to be flown at optimum aircraft performance and represents the most direct flight path, minimising track miles and emissions. This option will be slightly longer than the previous options due to the increased height profile. The Missed Approach Procedure represents the minimum practicable track miles flown. The MAP is an emergency procedure seldom used, but by its nature may require maximum engine power setting. More efficient profile should result in less impact than the Do Minimum option.	Aircraft only hold for the minimum amount of time necessary, so there is a limited greenhouse gas impact.	Aircraft will generally only hold for the minimum amount of time necessary. However, the NDB Hold may be used for training purposes, hence increasing airborne time and track miles flown resulting in an increase in emissions. This could have a greater impact than the Do Minimum option.	Aircraft will generally only hold for the minimum amount of time necessary. However, the NDB Hold may be used for training purposes, hence increasing airborne time and track miles flown resulting in an increase in emissions. This could have a greater impact than the Do Minimum option.	Aircraft will generally only hold for the minimum amount of time necessary. However, the NDB Hold may be used for training purposes, hence increasing airborne time and track miles flown resulting in an increase in emissions. This could have a greater impact than the Do Minimum option.	Without any regulated airspace, there is an increased likelihood of aircraft requiring avoidance action which will have an impact on emissions in the area around the airport.	Although the introduction of an ATZ may result in the re-routing of some GA traffic in the local area, it is not likely to significantly increase the number of track miles flown with minimal impact on emissions. It may lead to GA aircraft flying at a higher altitude, thereby reducing emissions. Possible small positive impact to the Do Minimum option if GA fly at a higher altitude.
Wider Society	Capacity and resilience	Initial Options Appraisal: Qualitative	This procedure has been designed in consultation with NATS and the FASI-S programme, in accordance with the UK Airspace Modernisation Strategy. This option enables a consistent approach to aircraft arriving from the airway system. This enables increased capacity, efficiency and reduced track mileage.	This procedure has been designed in consultation with NATS and the FASI-S programme, in accordance with the UK Airspace Modernisation Strategy. This option enables a consistent approach to aircraft arriving from the airway system. This enables increased capacity, efficiency and reduced track mileage.	This procedure has been designed in consultation with NATS and the FASI-S programme, in accordance with the UK Airspace Modernisation Strategy. This option enables a consistent approach to aircraft arriving from the airway system. This enables increased capacity, efficiency and reduced track mileage.	This procedure has been designed in consultation with NATS and the FASI-S programme, in accordance with the UK Airspace Modernisation Strategy. This option enables a consistent approach to aircraft arriving from the airway system. This enables increased capacity, efficiency and reduced track mileage.	The Do Nothing option will have no impact on the capacity and resilience of the overall national airspace infrastructure.	This option will have no impact on the capacity and resilience of the overall national airspace infrastructure. No change to the Do Minimum option.	This option will have no impact on the capacity and resilience of the overall national airspace infrastructure. No change to the Do Minimum option.	This option will have no impact on the capacity and resilience of the overall national airspace infrastructure. No change to the Do Minimum option.	This option will have no impact on the capacity and resilience of the overall national airspace infrastructure.	This option will have no impact on the capacity and resilience of the overall national airspace infrastructure. No change to the Do Minimum option.
General Aviation	Access	Initial Options Appraisal: Qualitative	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted. No change to the Do Minimum option.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted. No change to the Do Minimum option.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted. No change to the Do Minimum option.	No changes are proposed to the parameters of the current airspace structure around Manston Airport and therefore no change to airspace access is predicted.	The introduction of an ATZ will have an impact on GA access. If this option is taken forward, GA pilots would be required to contact ATC and request permission to enter the ATZ. Any pilots who are unwilling or unable to do so cannot enter the ATZ, restricting their airspace access, compared to the existing airspace arrangements.
General Aviation / commercial airlines	Economic impact from increased effective capacity	Initial Options Appraisal: Qualitative	The introduction of PBN procedures coordinated with NATS and other FASI-S sponsors will contribute to the delivery of associated benefits including increased effective capacity which is predicted to have direct and indirect economic benefits associated with an increase in both air transport and GA movements.	The introduction of PBN procedures coordinated with NATS and other FASI-S sponsors will contribute to the delivery of associated benefits including increased effective capacity which is predicted to have direct and indirect economic benefits associated with an increase in both air transport and GA movements.	The introduction of PBN procedures coordinated with NATS and other FASI-S sponsors will contribute to the delivery of associated benefits including increased effective capacity which is predicted to have direct and indirect economic benefits associated with an increase in both air transport and GA movements.	The introduction of PBN procedures coordinated with NATS and other FASI-S sponsors will contribute to the delivery of associated benefits including increased effective capacity which is predicted to have direct and indirect economic benefits associated with an increase in both air transport and GA movements.	The Do Nothing option could have a positive economic benefit to the area giving GA aircraft the flexibility to hold while waiting clearance to land at the airport, rather than landing elsewhere.	No change to the Do Minimum option.	No change to the Do Minimum option.	No change to the Do Minimum option.	The economic impact of no regulated airspace will be a potential increase in aircraft fuel costs due to avoidance action and additional track mileage required by aircraft to avoid conflicts.	The economic impact of an ATZ will be realised as movements will be handled in a more efficient way, increasing effective capacity at the airport. This will be a positive benefit over the Do Minimum option.
General Aviation / commercial airlines	Fuel burn	Initial Options Appraisal: Qualitative	Flown at optimum aircraft performance and with continuous descent profile to minimise fuel burn. The MAP minimises the number of track miles flown. The MAP is an emergency procedure requiring maximum engine power settings but it is typically rarely used. More efficient profile should result in less impact than the Do Minimum option.	Flown at optimum aircraft performance and with continuous descent profile to minimise fuel burn. The MAP is slightly further than the previous option with an associated increase in fuel burn. The MAP is an emergency procedure requiring maximum engine power settings but it is typically rarely used. More efficient profile should result in less impact than the Do Minimum option.	Flown at optimum aircraft performance and with continuous descent profile to minimise fuel burn. The MAP minimises the number of track miles flown. The MAP is an emergency procedure requiring maximum engine power settings but it is typically rarely used. More efficient profile should result in less impact than the Do Minimum option.	The procedure incorporates a continuous descent profile, to be flown at optimum aircraft performance and represents the most direct flight path, minimising fuel burn This option will be slightly longer than the previous options due to the increased height profile. The Missed Approach Procedure represents the minimum practicable track miles flown. The MAP is an emergency procedure requiring maximum engine power settings but it is typically rarely used. More efficient profile should result in less impact than the Do Minimum option.	Aircraft only hold for the minimum amount of time necessary, so there is a limited fuel burn impact.	Aircraft will generally only hold for the minimum amount of time necessary. However, the NDB Hold may be used for training purposes, hence increasing airborne time and track miles flown resulting in an increase in fuel used. This could have a greater impact than the Do Minimum option.	Aircraft will generally only hold for the minimum amount of time necessary. However, the NDB Hold may be used for training purposes, hence increasing airborne time and track miles flown resulting in an increase in fuel used. This could have a greater impact than the Do Minimum option.	Aircraft will generally only hold for the minimum amount of time necessary. However, the NDB Hold may be used for training purposes, hence increasing airborne time and track miles flown resulting in an increase in fuel used. This could have a greater impact than the Do Minimum option.	Without any regulated airspace, there is an increased likelihood of aircraft having to carry out avoidance action or fly greater track mileage to avoid conflicts, which will have an impact on fuel burn.	Aircraft within an ATZ will be handled in a far more efficient manor, reducing the overall track mileage and fuel burn associated with any potential 'see and avoid' manoeuvres required by VFR flights to maintain safe separation. Fuel burn may increase for some GA traffic who re-route to avoid the ATZ, but this is not likely to be a significant increase. It may lead to GA aircraft flying at a higher altitude, thereby reducing fuel burn. Possible small positive impact to the Do Minimum option if GA fly at a higher altitude.
Commercial airlines	Training costs	Initial Options Appraisal: Qualitative	There will be no additional training costs required for commercial operators flying PBN routes or procedures.	There will be no additional training costs required for commercial operators flying PBN routes or procedures.	There will be no additional training costs required for commercial operators flying PBN routes or procedures.	There will be no additional training costs required for commercial operators flying PBN routes or procedures.	The NDB Hold option relates only to GA aircraft so there will be no additional training costs required for commercial operators. There would be no training costs for GA associated with the Do Minimum option.	The NDB Hold option relates only to GA aircraft so there will be no additional training costs required for commercial operators. If used for training purposes, implementing this option could increase training costs for GA.	The NDB Hold option relates only to GA aircraft so there will be no additional training costs required for commercial operators. If used for training purposes, implementing this option could increase training costs for GA.	The NDB Hold option relates only to GA aircraft so there will be no additional training costs required for commercial operators. If used for training purposes, implementing this option could increase training costs for GA.	There will be no additional training costs associated with the Do Minimum option.	There are no additional training costs associated with this option. No change to the Do Minimum option.
Commercial airlines	Other costs	Initial Options Appraisal: Qualitative	The availability of approved procedures should lead to fewer minima related diversions and associated costs. Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Any additional costs are likely to be less than those associated with the Do Minimum option.	The availability of approved procedures should lead to fewer minima related diversions and associated costs. Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Any additional costs are likely to be less than those associated with the Do Minimum option.	The availability of approved procedures should lead to fewer minima related diversions and associated costs. Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Any additional costs are likely to be less than those associated with the Do Minimum option.	The availability of approved procedures should lead to fewer minima related diversions and associated costs. Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Any additional costs are likely to be less than those associated with the Do Minimum option.	The NDB Hold option relates only to GA aircraft so there will be no additional costs required for commercial operators.	The NDB Hold option relates only to GA aircraft so there will be no additional costs required for commercial operators.	The NDB Hold option relates only to GA aircraft so there will be no additional costs required for commercial operators.	The NDB Hold option relates only to GA aircraft so there will be no additional costs required for commercial operators.	There will be no additional other costs imposed on commercial aviation associated with the Do Minimum option.	There will be no additional other costs imposed on commercial aviation associated with this option. No change to the Do Minimum option.
Airport / Air navigation service provider	Infrastructure costs	Initial Options Appraisal: Qualitative	There will be no additional infrastructure costs associated with the introduction of PBN routes or procedures. No change from the Do Minimum option.	There will be no additional infrastructure costs associated with the introduction of PBN routes or procedures. No change from the Do Minimum option.	There will be no additional infrastructure costs associated with the introduction of PBN routes or procedures. No change from the Do Minimum option.	There will be no additional infrastructure costs associated with the introduction of PBN routes or procedures. No change from the Do Minimum option.	There are no additional infrastructure costs associated with the Do Minimum option as a direct result of this ACP over and above the costs of reopening Manston Airport as a NSIP.	There will be no additional infrastructure costs associated with the introduction of an NDB Hold over and above the costs of reopening Manston Airport as a NSIP. No change from the Do Minimum option.	There will be no additional infrastructure costs associated with the introduction of an NDB Hold over and above the costs of reopening Manston Airport as a NSIP. No change from the Do Minimum option.	There will be no additional infrastructure costs associated with the introduction of an NDB Hold over and above the costs of reopening Manston Airport as a NSIP. No change from the Do Minimum option.	There are no additional infrastructure costs associated with the Do Minimum option.	There will be no additional infrastructure costs imposed on commercial aviation associated with this option. No change to the Do Minimum option.
Airport / Air navigation service provider	Operational costs	Initial Options Appraisal: Qualitative	The operational costs associated with implementing PBN procedures relate to IFP design, validation (ground and airborne), safety assessment, airspace change and consultation, certification and publication. Once implemented, the costs of ownership of PBN procedures is very low, requiring maintenance of the procedure on a five yearly basis.	The operational costs associated with implementing PBN procedures relate to IFP design, validation (ground and airborne), safety assessment, airspace change and consultation, certification and publication. Once implemented, the costs of ownership of PBN procedures is very low, requiring maintenance of the procedure on a five yearly basis.	The operational costs associated with implementing PBN procedures relate to IFP design, validation (ground and airborne), safety assessment, airspace change and consultation, certification and publication. Once implemented, the costs of ownership of PBN procedures is very low, requiring maintenance of the procedure on a five yearly basis.	The operational costs associated with implementing PBN procedures relate to IFP design, validation (ground and airborne), safety assessment, airspace change and consultation, certification and publication. Once implemented, the costs of ownership of PBN procedures is very low, requiring maintenance of the procedure on a five yearly basis.	There will be no additional routine operational costs associated with implementing the Do Minimum option over and above the operational costs of reopening Manston Airport as a NSIP.	There will be no additional operational costs associated with the introduction of an NDB Hold over and above the costs of reopening Manston Airport as a NSIP. No change from the Do Minimum option.	There will be no additional operational costs associated with the introduction of an NDB Hold over and above the costs of reopening Manston Airport as a NSIP. No change from the Do Minimum option.	There will be no additional operational costs associated with the introduction of an NDB Hold over and above the costs of reopening Manston Airport as a NSIP. No change from the Do Minimum option.	There are no additional operational costs associated with the Do Minimum option.	There are no additional operational costs associated with this option. No change to the Do Minimum option.
Airport / Air navigation service provider	Deployment costs	Initial Options Appraisal: Qualitative	There will be no additional deployment costs associated with the introduction of PBN procedures. No change from the Do Minimum option.	There will be no additional deployment costs associated with the introduction of PBN procedures. No change from the Do Minimum option.	There will be no additional deployment costs associated with the introduction of PBN procedures. No change from the Do Minimum option.	There will be no additional deployment costs associated with the introduction of PBN procedures. No change from the Do Minimum option.	There will be no additional deployment costs associated with implementing the Do Minimum option over and above the operational costs of reopening Manston Airport as a NSIP.	There will be no additional deployment costs associated with the introduction of an NDB Hold over and above the costs of reopening Manston Airport as a NSIP. No change from the Do Minimum option.	There will be no additional deployment costs associated with the introduction of an NDB Hold over and above the costs of reopening Manston Airport as a NSIP. No change from the Do Minimum option.	There will be no additional deployment costs associated with the introduction of an NDB Hold over and above the costs of reopening Manston Airport as a NSIP. No change from the Do Minimum option.	There are no additional deployment costs associated with the Do Minimum option.	There are no additional deployment costs associated with this option. No change to the Do Minimum option.
Safety Assessment	Safety Assessment	Initial Options Appraisal: Qualitative	No significant safety implications were identified during the safety assessment. The Hold is positioned overhead the Thanet Offshore Windfarm. Potential loss of aircraft identification in Windfarm clutter, requiring implementation of technical or operational mitigation for the impact of wind turbine generators on PSR.	No significant safety implications were identified during the safety assessment. The Hold is positioned overhead the Thanet Offshore Windfarm. Potential loss of aircraft identification in Windfarm clutter, requiring implementation of technical or operational mitigation for the impact of wind turbine generators on PSR.	The safety assessment identified significant safety implications relating to the position of the south eastern Initial Approach Segment (conflict with gliders in Class G airspace with the Transition procedure) and the position of the Hold (close to Southend CTAs and overhead the Kentish Flats Offshore Windfarm). These issues have been mitigated at the Design Principles Evaluation stage by the removal of this Initial Approach Segment for consideration and the Hold position will be moved further east. There are no further significant safety implications for this option.	The safety assessment identified significant safety implications relating to the position of the south eastern Initial Approach Segment (conflict with gliders in Class G airspace with the Transition procedure) and the position of the Hold (close to Southend CTAs and overhead the Kentish Flats Offshore Windfarm). These issues have been mitigated at the Design Principles Evaluation stage by the removal of this Initial Approach Segment for consideration and the Hold position will be moved further east. There are no further significant safety implications for this option.	No significant safety implications were identified during the safety assessment.	Safety conflict with commercial aircraft executing a MAP. Not possible to deconflict traffic in the overhead Hold from aircraft executing a MAP. Possible wake turbulence risk to VFR traffic in the hold. Mitigated by not allowing the Hold to be used by GA aircraft when aircraft are inbound on an approach procedure.	Safety conflict with commercial aircraft executing a MAP. Not possible to deconflict traffic in the overhead Hold from aircraft executing a MAP. Possible wake turbulence risk to VFR traffic in the hold. Mitigated by not allowing the Hold to be used by GA aircraft when aircraft are inbound on an approach procedure.	Safety conflict with commercial aircraft executing a MAP. Not possible to deconflict traffic in the overhead Hold from aircraft executing a MAP. Possible wake turbulence risk to VFR traffic in the hold. Mitigated by not allowing the Hold to be used by GA aircraft when aircraft are inbound on an approach procedure.	Without any regulated airspace at the airport, there would be no protection afforded to aircraft during the critical stages of flight. Commercial aircraft will be unable to carry out avoiding action from conflicting air traffic.	No significant safety implications were identified during the safety assessment. Introducing an ATZ will have a positive safety impact on operations at Manston Airport.