INITIAL OPTIONS APPRAISAL

Issue 1

		Summary of Analysis	The Do Nothing option represents the current situation where there is no airport at Manston, and no air traffic. Consent has been granted for the airport development and the consequent introduction of a level of air traffic into the environment, hence this option is rejected.	The introduction of VFR-only procedures for the anticipated heavy freight air traffic does not meet key outcomes of the Airspace Modernisation Strategy, specifically reducing emissions and better noise management. Reliance on tactical vectoring from ATC would have a negative impact on both noise and emissions, specifically for overland routes.	Rejected - The shortest of the southern options, but with a greater noise impact than any of the options routing north after take-off due to overflight of more communities. Increased fuel burn and emissions due to restricted height profile to remain clear of other airports arrival routes. Significant safety impact with gliders. Rejected on safety grounds.	Rejected - This option is slightly longer and assessed to expose more communities and sensitive areas to noise than the previous option. Also has a greater noise impact than any of the options routing north after take-off. Increased fuel burn and emissions due to restricted height profile to remain clear of other airports arrival routes. Significant safety impact with gliders. Rejected on safety grounds.	Rejected - This option is longest of the southern options and is assessed to expose more communities and sensitive areas to noise than the previous options. Also has a greater noise impact than any of the options routing north after take-off. Increased fuel burn and emissions due to restricted height profile to remain clear of other airports arrival routes. Significant safety impact with gliders. Rejected on safety grounds.	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 turning right after 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 aircraft 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.
Group	**Impact**	**Level of Analysis**	**Do Nothing Baseline**	**SID Baseline (Do Minimum)**	**SID RWY 28 South (Eastern)**	**SID RWY 28 South (Central)**	**SID RWY 28 South (Western)**	**SID RWY 28 North (Eastern) to North**	**SID RWY 28 North (Central) to North**	**SID RWY 28 (Western) to North**	**SID RWY 28 (Eastern) to South**	**SID RWY 28 North (Central) to South**	**SID RWY 28 North (Western) to South**	**SID RWY 28 North (Eastern) to East**	**SID RWY 28 North (Central) to East**	**SID RWY 28 North (Western) to East**	**SID RWY 10 North**
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 meaning that there is no consistent approach to mitigate against the noise impact on local communities.	Although this option avoids large built-up areas, there are various rural villages and hamlets (e.g. Ash, Easterly and East Studdal) that would still be overflown below 7,000ft. Aircraft would likely have to remain at 7,000ft or below to avoid conflicting with traffic inbound to some of the London airports. This may have a knock-on effect in terms of noise to other areas of the south coast such as Dover and Folkestone. Noise impact likely to be similar to the Do Minimum option although more concentrated due to the predictability of routing.	Although this option avoids large built-up areas, there are various rural villages and hamlets (e.g. Preston, Wingham and Staple) that would still be overflown below 7,000ft. Aircraft would likely have to remain at 7,000ft or below to avoid conflicting with traffic inbound to some of the London airports. This may have a knock-on effect in terms of noise to other areas of the south coast such as Dover and Folkestone. This option also overflies a number of tourist attractions. Noise impact likely to be similar to the Do Minimum option although more concentrated due to the predictability of routing.	Although this option avoids large built-up areas, there are various rural villages and hamlets (e.g. Chillenden) that would still be overflown below 7,000ft. Aircraft would likely have to remain at 7,000ft or below to avoid conflicting with traffic inbound to some of the London airports. This may have a knock-on effect in terms of noise to other areas of the south coast such as Dover and Folkestone. This option also overflies a number of tourist attractions. Noise impact likely to be similar to the Do Minimum option although more concentrated due to the predictability of routing.	This option avoids large built-up areas, and is over a sparsely populated rural area, 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 over a sparsely populated area.	This option avoids large built-up areas and is over a sparsely populated rural area, 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 over a sparsely populated area.	Although this option avoids large built-up areas and is mainly over sparsely populated rural areas, 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 over a sparsely populated area.	This option avoids large built-up areas and is over a sparsely populated rural area, although there are a 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 over a sparsely populated area.	This option avoids large built-up areas and is over a sparsely populated rural area, 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 over a sparsely populated area.	Although this option avoids large built-up areas and is mainly over sparsely populated rural areas, 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 over a sparsely populated area.	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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 over a sparsely populated area.	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.
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 departing aircraft within 3 nautical miles of the airfield until above 1,000 ft. Aircraft are likely to be dispersed over a large area until above 1,000 ft, with the potential to impact on populated areas.	Local Air Quality is likely to be affected by departing aircraft within 3 nautical miles of the airfield until above 1,000 ft. Aircraft will be over sparsely populated areas until above 1,000 ft. Impact likely to be more concentrated than the Do Minimum option but affecting fewer people.	Local Air Quality is likely to be affected by departing aircraft within 3 nautical miles of the airfield until above 1,000 ft. Aircraft will be over sparsely populated areas until above 1,000 ft. Impact likely to be more concentrated than the Do Minimum option but affecting fewer people.	Local Air Quality is likely to be affected by departing aircraft within 3 nautical miles of the airfield until above 1,000 ft. Aircraft will be over sparsely populated areas until above 1,000 ft. Impact likely to be more concentrated than the Do Minimum option but affecting fewer people.	Local Air Quality is likely to be affected by departing aircraft within 3 nautical miles of the airfield until above 1,000 ft. Aircraft will be over sparsely populated areas until above 1,000 ft. Impact likely to be more concentrated than the Do Minimum option but affecting fewer people.	Local Air Quality is likely to be affected by departing aircraft within 3 nautical miles of the airfield until above 1,000 ft. Aircraft will be over sparsely populated areas, although closer to the village of St Nicholas-At-Wade than the previous option before reaching 1,000 ft. Impact likely to be more concentrated than the Do Minimum option but affecting fewer people.	Local Air Quality is likely to be affected by departing aircraft within 3 nautical miles of the airfield until above 1,000 ft. Although the initial part of the climb will be over sparsely populated areas, aircraft will be close to the village of St Nicholas-At-Wade before reaching 1,000 ft. Impact likely to be more concentrated than the Do Minimum option but affecting fewer people.	Local Air Quality is likely to be affected by departing aircraft within 3 nautical miles of the airfield until above 1,000 ft. Aircraft will be over sparsely populated areas until above 1,000 ft. Impact likely to be more concentrated than the Do Minimum option but affecting fewer people.	Local Air Quality is likely to be affected by departing aircraft within 3 nautical miles of the airfield until above 1,000 ft. Aircraft will be over sparsely populated areas, although closer to the village of St Nicholas-At-Wade than the previous option before reaching 1,000 ft. Impact likely to be more concentrated than the Do Minimum option but affecting fewer people.	Local Air Quality is likely to be affected by departing aircraft within 3 nautical miles of the airfield until above 1,000 ft. Although the initial part of the climb will be over sparsely populated areas, aircraft will be close to the village of St Nicholas-At-Wade before reaching 1,000 ft. Impact likely to be more concentrated than the Do Minimum option but affecting fewer people.	Local Air Quality is likely to be affected by departing aircraft within 3 nautical miles of the airfield until above 1,000 ft. Aircraft will be over sparsely populated areas until above 1,000 ft. Impact likely to be more concentrated than the Do Minimum option but affecting fewer people.	Local Air Quality is likely to be affected by departing aircraft within 3 nautical miles of the airfield until above 1,000 ft. Aircraft will be over sparsely populated areas, although closer to the village of St Nicholas-At-Wade than the previous option before reaching 1,000 ft. Impact likely to be more concentrated than the Do Minimum option but affecting fewer people.	Local Air Quality is likely to be affected by departing aircraft within 3 nautical miles of the airfield until above 1,000 ft. Although the initial part of the climb will be over sparsely populated areas, aircraft will be close to the village of St Nicholas-At-Wade before reaching 1,000 ft. Impact likely to be more concentrated than the Do Minimum option but affecting fewer people.	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.
Wider Society	Greenhouse Gas impact	Initial Options Appraisal: Qualitative	There is no change to the greenhouse gas impact with the Do Nothing option.	In terms of minimising aircraft emissions and reduced air pollution, this option does not present a consistent approach. A lack of connectivity to the rest of the airspace network would result in inefficient climb profiles where aircraft will likely hold at lower altitudes for longer, along with the increased likelihood of avoiding action (VFR traffic) leading to increase track mileage and emissions.	Due to the confliction with arrivals to the London airports, aircraft on this option would likely be held under 7,000 ft for longer periods, preventing continuous climb operations, resulting in greater fuel burn and pollution at lower altitudes. This option minimises track miles for aircraft routing to the south and west. Likely to have similar impact to Do Minimum option due to inefficient climb profiles although may allow more direct routing.	Due to the confliction with arrivals to the London airports, aircraft on this option would likely be held under 7,000ft for longer periods, preventing continuous climb operations, resulting in greater fuel burn and pollution at lower altitudes. Although this option is slightly longer (1.2 nautical miles) than the previous option, it still represents minimal track miles for aircraft routing to the south and west. Likely to have similar impact to Do Minimum option due to inefficient climb profiles although may allow more direct routing.	Due to the confliction with arrivals to the London airports, aircraft on this option would likely be held under 7,000ft for longer periods, preventing continuous climb operations, resulting in greater fuel burn and pollution at lower altitudes. This option is slightly longer than the previous option (0.9 nautical mile) and is the longest of the options departing to the south but still represents fewer track miles for aircraft routing to the south and west. Likely to have similar impact to Do Minimum option due to inefficient climb profiles although may allow more direct routing.	This option represents the minimal track miles for aircraft departing to the north. However, due to the integration required with arrivals into Southend Airport, aircraft would not be able to perform continuous climb operations and would be held at 5,000 ft or less for longer. Likely to have similar impact to Do Minimum option due to inefficient climb profiles although may allow more direct routing.	This option is slightly longer (0.6 nautical mile) than the previous option but still represents the minimal track miles for aircraft departing to the north. However, due to the integration required with arrivals into Southend Airport, aircraft would not be able to perform continuous climb operations and would be held at 5,000 ft or less for longer. Likely to have similar impact to Do Minimum option due to inefficient climb profiles although may allow more direct routing.	This option is slightly longer (1.2 nautical miles) than the previous option but still represents the minimal track miles for aircraft departing to the north. However, due to the integration required with arrivals into Southend Airport, aircraft would not be able to perform continuous climb operations and would be held at 5,000 ft or less for longer. Likely to have similar impact to Do Minimum option due to inefficient climb profiles although may allow more direct routing.	To ensure deconfliction from traffic descending on the Southend Airport arrival route, this procedure will have to include a ‘not above’ height restriction until clear to the east of the arrival’s procedure. Aircraft may still be able to perform a Continuous Climb departure, depending on the climb gradient that can be achieved, but it cannot be guaranteed. By turning right after take-off, aircraft routing to the south east or south will have more track miles to fly. Likely to have a greater impact than the Do Minimum option due to increased track miles and inefficient climb profiles.	To ensure deconfliction from traffic descending on the Southend Airport arrival route, this procedure will have to include a ‘not above’ height restriction until clear to the east of the arrival’s procedure. Aircraft may still be able to perform a Continuous Climb departure, depending on the climb gradient that can be achieved, but it cannot be guaranteed. By turning right after take-off, aircraft routing to the south east or south will have more track miles to fly. This option is slightly (0.6 nautical mile) longer than the previous option. Likely to have a greater impact than the Do Minimum option due to increased track miles and inefficient climb profiles.	To ensure deconfliction from traffic descending on the Southend Airport arrival route, this procedure will have to include a ‘not above’ height restriction until clear to the east of the arrival’s procedure. Aircraft may still be able to perform a Continuous Climb departure, depending on the climb gradient that can be achieved, but it cannot be guaranteed. By turning right after take-off, aircraft routing to the south east or south will have more track miles to fly. This option is slightly (1.2 nautical miles) longer than the previous option. Likely to have a greater impact than the Do Minimum option due to increased track miles and inefficient climb profiles.	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Aircraft may still be able to perform a Continuous Climb departure, depending on the climb gradient that can be achieved, but it cannot be guaranteed. By turning right after take-off and extending to the east, aircraft will have more track miles to fly but once separated to the east of the arrival routes, aircraft will be able to perform a continuous climb to reach cruising altitude sooner. This option is slightly (0.6 nautical mile) longer than the previous option. Likely to require more track miles than the Do Minimum option for some routes but improved climb profiles should result in less impact overall.	To ensure deconfliction from traffic descending on the Southend Airport arrival route, this procedure will have to include a ‘not above’ height restriction until clear to the east of the arrival’s procedure. Aircraft may still be able to perform a Continuous Climb departure, depending on the climb gradient that can be achieved, but it cannot be guaranteed. By turning right after take-off and extending to the east, aircraft will have more track miles to fly but once separated to the east of the arrival routes, aircraft will be able to perform a continuous climb to reach cruising altitude sooner. This option is slightly (1.2 nautical miles) longer than the previous option. Likely to require more track miles than the Do Minimum option for some routes but improved climb profiles should result in less impact overall.	This option allows for continuous climb operations and minimises the number of track miles flown. Improved climb profile should result in less impact than the Do Minimum option.
Wider Society	Capacity and resilience	Initial Options Appraisal: Qualitative	The Do Nothing option will have no impact on the capacity and resilience of the overall national airspace infrastructure.	This option is an ineffective way of managing airspace, resulting in in-direct routings, delays and increased noise and fuel burn.	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 capped at 7,000 ft until laterally separated to the west of the London airport arrival routes.	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 capped at 7,000 ft until laterally separated to the west of the London airport arrival routes.	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 capped at 7,000 ft until laterally separated to the west of the London airport arrival routes.	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 capped at 5,000 ft until clear of Southend Airport arrival routes.	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 capped at 5,000 ft until clear of Southend Airport arrival routes.	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 capped at 5,000 ft until clear of Southend Airport arrival routes.	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 Southend Airport arrival routes.	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 Southend Airport arrival routes.	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 Southend Airport arrival routes.	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 Southend Airport arrival routes.	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 Southend Airport arrival routes.	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 Southend Airport arrival routes.	This option does support the effective 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. Due to the more easterly track, aircraft are able to avoid arrival routes to London airports, improving airspace efficiency.
General Aviation	Access	Initial Options Appraisal: Qualitative	The Do Nothing option will have no impact on the access to airspace for GA aircraft.	Although this option would maintain access for GA, flights out of Manston would route according to the airways joining points and would give no consideration to other airspace users within the local area, leading to addition 'see and avoid' action.	This option does not impose any restrictions of GA airspace access. However, this route is over an area heavily utilised by gliding operations, specifically from Waldershare Park.	This option does not impose any restrictions of GA airspace access. However, this route is over an area heavily utilised by gliding operations, specifically from Waldershare Park.	This option does not impose any restrictions of GA airspace access. However, this route is over an area heavily utilised by gliding operations, specifically from Waldershare Park.	This route would have minimal impact on other airspace users.	This route would have minimal impact on other airspace users.	This route would have minimal impact on other airspace users.	This route would have minimal impact on other airspace users.	This route would have minimal impact on other airspace users.	This route would have minimal impact on other airspace users.	This route would have minimal impact on other airspace users.	This route would have minimal impact on other airspace users.	This route would have minimal impact on other airspace users.	This route would have minimal impact on other airspace users.
General Aviation / commercial airlines	Economic impact from increased effective capacity	Initial Options Appraisal: Qualitative	The Do Nothing option will not allow an increase in air transport movements so will have no economic impact .	This option does not allow for the effective handling of departing traffic from Manston, resulting in reduced capacity.	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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.
General Aviation / commercial airlines	Fuel burn	Initial Options Appraisal: Qualitative	There is no change to fuel burn with the Do Nothing option.	Aircraft departing Manston for various airway joining points would mean the potential for greater track miles following avoiding action in relation to other airspace users, especially VFR traffic. Additionally, depending on the intended joining point, the aircraft flight path may be less than optimum, increasing fuel burn.	Increased fuel burn associated with this option will occur below 7,000 ft due to the required integration with arrivals into London airports. Such a restriction prevents continuous climb operations, making it inefficient in terms of aircraft fuel burn. Likely to have similar impact to Do Minimum option due to inefficient climb profiles although may allow more direct routing.	Increased fuel burn associated with this option will occur below 7,000 ft due to the required integration with arrivals into London airports. Such a restriction prevents continuous climb operations, making it inefficient in terms of aircraft fuel burn. Likely to have similar impact to Do Minimum option due to inefficient climb profiles although may allow more direct routing.	Increased fuel burn associated with this option will occur below 7,000 ft due to the required integration with arrivals into London airports. Such a restriction prevents continuous climb operations, making it inefficient in terms of aircraft fuel burn. Furthermore, this is the longest of the 3 options for the Runway 28 departures to the south. Likely to have similar impact to Do Minimum option due to inefficient climb profiles although may allow more direct routing.	This option will initially have a limited fuel burn impact until the aircraft reaches 5,000ft, where it would be held until clear of the Southend arrival routes, therefore, continuous climb operations are not possible. Likely to have similar impact to Do Minimum option due to inefficient climb profiles although may allow more direct routing.	This option will initially have a limited fuel burn impact until the aircraft reaches 5,000ft, where it would be held until clear of the Southend arrival routes, therefore, continuous climb operations are not possible. Likely to have similar impact to Do Minimum option due to inefficient climb profiles although may allow more direct routing.	This option will initially have a limited fuel burn impact until the aircraft reaches 5,000 ft, where it would be held until clear of the Southend arrival routes, therefore, continuous climb operations are not possible. Likely to have similar impact to Do Minimum option due to inefficient climb profiles although may allow more direct routing.	To ensure aircraft are deconflicted with Southend airport arrivals, aircraft flying this route would be subject to a height restriction, but may still be able to perform continuous climb operations, depending on the achieved climb gradient. This however, cannot be guaranteed. By turning right after take-off, aircraft routing to the south and south east will fly a greater number of track miles, incurring increased fuel burn. Likely to have a greater impact than the Do Minimum option due to increased track miles and inefficient climb profiles.	To ensure aircraft are deconflicted with Southend airport arrivals, aircraft flying this route would be subject to a height restriction, but may still be able to perform continuous climb operations, depending on the achieved climb gradient. This however, cannot be guaranteed. By turning right after take-off, aircraft routing to the south and south east will fly a greater number of track miles, incurring increased fuel burn. 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By turning right after take-off, aircraft routing to the south and south east will fly a greater number of track miles, incurring increased fuel burn. Likely to require more track miles than the Do Minimum option for some routes but improved climb profiles should result in less impact overall.	To ensure aircraft are deconflicted with Southend airport arrivals, aircraft flying this route would be subject to a height restriction, but may still be able to perform continuous climb operations, depending on the achieved climb gradient. This however, cannot be guaranteed. By turning right after take-off, aircraft routing to the south and south east will fly a greater number of track miles, incurring increased fuel burn. Likely to require more track miles than the Do Minimum option for some routes but improved climb profiles should result in less impact overall.	To ensure aircraft are deconflicted with Southend airport arrivals, aircraft flying this route would be subject to a height restriction, but may still be able to perform continuous climb operations, depending on the achieved climb gradient. This however, cannot be guaranteed. By turning right after take-off, aircraft routing to the south and south east will fly a greater number of track miles, incurring increased fuel burn. Likely to require more track miles than the Do Minimum option for some routes but improved climb profiles should result in less impact overall.	Due the easterly track of this option, conflicts with arrival aircraft into London airports can be avoided, enabling continuous climb operations and optimum climb gradients, reducing fuel burn, especially at lower altitudes. This procedure also minimises the number of track miles flown. Improved climb profile should result in less impact than the Do Minimum option.
Commercial airlines	Training costs	Initial Options Appraisal: Qualitative	There will be no training costs associated with the Do Nothing option.	At this stage, the development of Manston Airport is too immature to consider airline training costs.	Due to the current state of Manston Airport, it is anticipated that some pilot training may be required, specific to Manston.	Due to the current state of Manston Airport, it is anticipated that some pilot training may be required, specific to Manston.	Due to the current state of Manston Airport, it is anticipated that some pilot training may be required, specific to Manston.	Due to the current state of Manston Airport, it is anticipated that some pilot training may be required, specific to Manston.	Due to the current state of Manston Airport, it is anticipated that some pilot training may be required, specific to Manston.	Due to the current state of Manston Airport, it is anticipated that some pilot training may be required, specific to Manston.	Due to the current state of Manston Airport, it is anticipated that some pilot training may be required, specific to Manston.	Due to the current state of Manston Airport, it is anticipated that some pilot training may be required, specific to Manston.	Due to the current state of Manston Airport, it is anticipated that some pilot training may be required, specific to Manston.	Due to the current state of Manston Airport, it is anticipated that some pilot training may be required, specific to Manston.	Due to the current state of Manston Airport, it is anticipated that some pilot training may be required, specific to Manston.	Due to the current state of Manston Airport, it is anticipated that some pilot training may be required, specific to Manston.	Due to the current state of Manston Airport, it is anticipated that some pilot training may be required, specific to Manston.
Commercial airlines	Other costs	Initial Options Appraisal: Qualitative	There will be no additional costs associated with the Do Nothing option.	At this stage, the development of Manston Airport is too immature to consider airline costs.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.
Airport / Air navigation service provider	Infrastructure costs	Initial Options Appraisal: Qualitative	There will be no additional infrastructure costs associated with the Do Nothing option.	There will be very limited cost implications for this option as it involves the addition of no new departure routes.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.
Airport / Air navigation service provider	Operational costs	Initial Options Appraisal: Qualitative	There are no operational costs associated with the Do Nothing option.	There will be very limited cost implications for this option as it involves the addition of no new departure routes.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.
Airport / Air navigation service provider	Deployment costs	Initial Options Appraisal: Qualitative	There are no deployment costs associated with the Do Nothing option.	The Do Minimal option will have a limited deployment cost implication for Manston, simply because with this option there is nothing to deploy. Therefore, no training or documentation updates are required.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.
Safety Assessment	Safety Assessment	Initial Options Appraisal: Qualitative	There are no safety implications associated with the Do Nothing option.	No significant safety implications were identified during the safety assessment. Aircraft departing VFR will require a deconfliction service to be provided by Manston ATC for separation with other traffic.	Safety conflict with gliders in Class G airspace. Options pass close to Waldershare Gliding Site on approach to DVR VOR. Gliders quoted as operating up to [the base of CAS] 7, 000 ft (QNH). Gliders not detectable by Primary Surveillance Radar and unlikely to be transponder/ radio equipped. Manston Traffic potentially held at 7,000 ft at DVR VOR to deconflict from other London TMA arrivals and departures increasing 'time at risk' of major separation event with a glider at 7,000 ft. Unable to adequately mitigate: gliders may not be radio equipped and an LOA/MOU not likely to offer robust separation between Manston and Waldershare traffic.	Safety conflict with gliders in Class G airspace. Options pass close to Waldershare Gliding Site on approach to DVR VOR. Gliders quoted as operating up to [the base of CAS] 7, 000 ft (QNH). Gliders not detectable by Primary Surveillance Radar and unlikely to be transponder/ radio equipped. Manston Traffic potentially held at 7,000 ft at DVR VOR to deconflict from other London TMA arrivals and departures increasing 'time at risk' of major separation event with a glider at 7,000 ft. Unable to adequately mitigate: gliders may not be radio equipped and an LOA/MOU not likely to offer robust separation between Manston and Waldershare traffic.	Safety conflict with gliders in Class G airspace. Options pass close to Waldershare Gliding Site on approach to DVR VOR. Gliders quoted as operating up to [the base of CAS] 7, 000 ft (QNH). Gliders not detectable by Primary Surveillance Radar and unlikely to be transponder/ radio equipped. Manston Traffic potentially held at 7,000 ft at DVR VOR to deconflict from other London TMA arrivals and departures increasing 'time at risk' of major separation event with a glider at 7,000 ft. Unable to adequately mitigate: gliders may not be radio equipped and an LOA/MOU not likely to offer robust separation between Manston and Waldershare traffic.	No significant safety implications were identified during the safety assessment. Departing aircraft will require a deconfliction service to be provided by Manston ATC for separation with other traffic. An LOA/MOU agreement between Manston Airport and Maypole airfield will mitigate any potential conflict between heavy transport and GA aircraft. Potential conflict between departing aircraft and traffic arriving at other London airports, 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. Departing aircraft will require a deconfliction service to be provided by Manston ATC for separation with other traffic. An LOA/MOU agreement between Manston Airport and Maypole airfield will mitigate any potential conflict between heavy transport and GA aircraft. Potential conflict between departing aircraft and traffic arriving at other London airports, 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. Departing aircraft will require a deconfliction service to be provided by Manston ATC for separation with other traffic. An LOA/MOU agreement between Manston Airport and Maypole airfield will mitigate any potential conflict between heavy transport and GA aircraft. Potential conflict between departing aircraft and traffic arriving at other London airports, 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. Departing aircraft will require a deconfliction service to be provided by Manston ATC for separation with other traffic. An LOA/MOU agreement between Manston Airport and Maypole airfield will mitigate any potential conflict between heavy transport and GA aircraft. Potential conflict between departing aircraft and traffic arriving at other London airports, 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. Departing aircraft will require a deconfliction service to be provided by Manston ATC for separation with other traffic. An LOA/MOU agreement between Manston Airport and Maypole airfield will mitigate any potential conflict between heavy transport and GA aircraft. Potential conflict between departing aircraft and traffic arriving at other London airports, 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. Departing aircraft will require a deconfliction service to be provided by Manston ATC for separation with other traffic. An LOA/MOU agreement between Manston Airport and Maypole airfield will mitigate any potential conflict between heavy transport and GA aircraft. Potential conflict between departing aircraft and traffic arriving at other London airports, 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. Departing aircraft will require a deconfliction service to be provided by Manston ATC for separation with other traffic. An LOA/MOU agreement between Manston Airport and Maypole airfield will mitigate any potential conflict between heavy transport and GA aircraft. Potential conflict between departing aircraft and traffic arriving at other London airports, mitigated by height restrictions on the Manston departure procedures to ensure departing traffic remains below arrivals traffic. 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. Departing aircraft will require a deconfliction service to be provided by Manston ATC for separation with other traffic. An LOA/MOU agreement between Manston Airport and Maypole airfield will mitigate any potential conflict between heavy transport and GA aircraft. Potential conflict between departing aircraft and traffic arriving at other London airports, mitigated by height restrictions on the Manston departure procedures to ensure departing traffic remains below arrivals traffic. 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. Departing aircraft will require a deconfliction service to be provided by Manston ATC for separation with other traffic. An LOA/MOU agreement between Manston Airport and Maypole airfield will mitigate any potential conflict between heavy transport and GA aircraft. Potential conflict between departing aircraft and traffic arriving at other London airports, mitigated by height restrictions on the Manston departure procedures to ensure departing traffic remains below arrivals traffic. 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. Departing aircraft will require a deconfliction service to be provided by Manston ATC for separation with other traffic. 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.

INITIAL OPTIONS APPRAISAL

Group	Impact	Level of Analysis	SID RWY 10 South to East	SID RWY 10 South to West	Transition Baseline (Do Minimum)
		Summary of Analysis	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.	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.	Rejected - reliance on tactical vectoring from ATC would have a negative impact on both noise and emissions, specifically for overland routes.
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.	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. However, as aircraft proceed on this SID, they may be required to remain at approximately 7,000ft until laterally separated the west of arrival routes into London airports. 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 this option would rely on tactical vectoring from ATC, there would be no consistency in terms of aircraft routing. Aircraft tracks will vary depending on the direct the aircraft is approaching Manston from.
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.	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.	In terms of air quality, although this option would only affect communities below the final approach (I.e. Ramsgate). Having said that, due to the unpredictable nature of traffic presentation, overflight (and therefore air quality) cannot be limited to a particular area.
Wider Society	Greenhouse Gas impact	Initial Options Appraisal: Qualitative	This option allows for continuous climb operations. Routing to the south before turning east will increase the number of track miles flow. Improved climb profile should result in less impact than the Do Minimum option.	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.	Due to the unpredictable nature of traffic presentation, greenhouse gas emissions would be spread across the airspace and may not be the most efficient method of transition into Manston. Due to the inefficient handling of aircraft, greenhouse gas emissions will likely increase due to an increase in track miles required during vectoring.
Wider Society	Capacity and resilience	Initial Options Appraisal: Qualitative	This option does support the effective 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. Due to the more easterly track, aircraft are able to avoid arrival routes to London airports, improving airspace efficiency. This route would represent the most direct route for aircraft transiting to the near continent across the London FIR boundary.	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.	As there is no certainty about the presentation of traffic, the handling of air traffic may not be efficient enough to realise the potential capacity and resilience benefits.
General Aviation	Access	Initial Options Appraisal: Qualitative	This route would have minimal impact on other airspace users.	This route would have minimal impact on other airspace users.	Although there are no direct and immediate implications for GA Access, this option will lead to the inefficient handling of air traffic, including additional vectoring, restrictions and controls applied to GA traffic.
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 for airlines and general aviation.	Due to the height restriction prior to clearing the London airport arrival routes, additional fuel burn (and therefore additional costs) may be incurred by operators. Other than this point, this option would open up greater capacity within the local airspace domain.	The economic impact of this option centres around the increased fuel burn (and therefore increased costs) associated with vectoring flights into Manston. As presentation points may vary, capacity and overall efficiency in terms of routings will be unsustainable.
General Aviation / commercial airlines	Fuel burn	Initial Options Appraisal: Qualitative	This option does not impact on arrivals into London airports as it tracks to the South East, therefore, continuous climb operations and an optimal climb gradient can be realised. However, given the proximity to the FIR boundary, the later stages of this SID or on immediate departure from this SID, aircraft may be required to reduce their climb gradient, depending on the traffic situation in the adjacent FIRs. Improved climb profile should result in less impact than the Do Minimum option.	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.	As aircraft will present at various different locations depending on their point of origin, this option may require a significant increase in fuel burn.
Commercial airlines	Training costs	Initial Options Appraisal: Qualitative	Due to the current state of Manston Airport, it is anticipated that some pilot training may be required, specific to Manston.	Due to the current state of Manston Airport, it is anticipated that some pilot training may be required, specific to Manston.	At this stage, the development of Manston Airport is too immature to consider airline training costs.
Commercial airlines	Other costs	Initial Options Appraisal: Qualitative	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.
Airport / Air navigation service provider	Infrastructure costs	Initial Options Appraisal: Qualitative	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.
Airport / Air navigation service provider	Operational costs	Initial Options Appraisal: Qualitative	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.
Airport / Air navigation service provider	Deployment costs	Initial Options Appraisal: Qualitative	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.
Safety Assessment	Safety Assessment	Initial Options Appraisal: Qualitative	No significant safety implications were identified during the safety assessment. Departing aircraft will require a deconfliction service to be provided by Manston ATC for separation with other traffic.	No significant safety implications were identified during the safety assessment. Departing aircraft will require a deconfliction 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.

Group	Impact	Level of Analysis	Transition RWY 28 from North	Transition RWY 28 from North East	Transition RWY 28 from East	Transition RWY 28 from South East	Transition RWY 28 from South
		Summary of Analysis	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.
Communities	Noise impact on health and quality of life	Initial Options Appraisal: Qualitative	As this option is solely located over the sea, there is no implications in terms of noise impact on local communities. No change 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. No change 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. No change 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. No change 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. No change to the Do Minimum option.
Communities	Air Quality	Initial Options Appraisal: Qualitative	As this option is for transitions into Manston, there is no affect below 1,000ft. In addition to this, the proposed option is solely located over the sea. No change to the Do Minimum option.	As this option is for transitions into Manston, there is no affect below 1,000ft. In addition to this, the proposed option is solely located over the sea. No change to the Do Minimum option.	As this option is for transitions into Manston, there is no affect below 1,000ft. In addition to this, the proposed option is solely located over the sea. No change to the Do Minimum option.	As this option is for transitions into Manston, there is no affect below 1,000ft. In addition to this, the proposed option is solely located over the sea. No change to the Do Minimum option.	As this option is for transitions into Manston, there is no affect below 1,000ft. In addition to this, the proposed option is solely located over the sea. No change to the Do Minimum option.
Wider Society	Greenhouse Gas impact	Initial Options Appraisal: Qualitative	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.
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 (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.
General Aviation	Access	Initial Options Appraisal: Qualitative	As this option is solely located over the sea, it will have minimal impact on other airspace users.	As this option is solely located over the sea, it will have minimal impact on other airspace users.	As this option is solely located over the sea, it will have minimal impact on other airspace users.	As this option is solely located over the sea, it will have minimal impact on other airspace users.	As this option is solely located over the sea, it will have minimal impact on other airspace users.
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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.
General Aviation / commercial airlines	Fuel burn	Initial Options Appraisal: Qualitative	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.
Commercial airlines	Training costs	Initial Options Appraisal: Qualitative	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.
Commercial airlines	Other costs	Initial Options Appraisal: Qualitative	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.
Airport / Air navigation service provider	Infrastructure costs	Initial Options Appraisal: Qualitative	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.
Airport / Air navigation service provider	Operational costs	Initial Options Appraisal: Qualitative	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.
Airport / Air navigation service provider	Deployment costs	Initial Options Appraisal: Qualitative	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.
Safety Assessment	Safety Assessment	Initial Options Appraisal: Qualitative	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. 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.

Group	Impact	Level of Analysis	Transition RWY 10 from North to 2,500ft Approach	Transition RWY 10 from South to 2,500ft Approach (East)	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 (East)	Transition RWY 10 from South to 3,000ft Approach (West)	Approach Procedure Baseline (Do Minimum)
		Summary of Analysis	Direct track and oversea, minimum impact. Further track miles to join the procedure for aircraft arriving from the west and south.	Rejected - Slightly further than the following option from the south so greater noise impact and greater fuel burn and emissions. Significant safety impact with gliders. Rejected on safety grounds.	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.	Rejected - Slightly further than the following option from the south so greater noise impact and greater fuel burn and emissions. Significant safety impact with gliders. Rejected on safety grounds.	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.	Rejected - greater environmental impact due to unpredictable nature of approaches. Increased chance of a missed approach, increasing noise, track miles, fuel burn and emissions.
Communities	Noise impact on health and quality of life	Initial Options Appraisal: Qualitative	As this option is solely located over the sea, there is no implications in terms of noise impact on local communities. No change to the Do Minimum option.	This option does fly near some local schools, however, at this stage of the transition the aircraft would be above 4,000ft. It is also worth noting that 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.	This option routes over sparsely populated areas. It is also worth noting that 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.	As this option is solely located over the sea, there is no implications in terms of noise impact on local communities. No change to the Do Minimum option.	This option does fly near some local schools, however, at this stage of the transition the aircraft would be above 4,000ft. It is also worth noting that 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.	This option routes over sparsely populated areas. It is also worth noting that 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.	With this option, aircraft (especially those under VFR) are likely to perform varying different types of approach, meaning that the noise impact on communities is far more wide spread and un-even. Furthermore, such approaches increased the likelihood of missed approaches leading to additional approaches and therefore, more noise.
Communities	Air Quality	Initial Options Appraisal: Qualitative	As this option is for transitions into Manston, there is no affect below 1,000ft. In addition to this, the proposed option is solely located over the sea. No change to the Do Minimum option.	As this option is for transitions into Manston, there is no affect below 1,000ft. No change to the Do Minimum option.	As this option is for transitions into Manston, there is no affect below 1,000ft. No change to the Do Minimum option.	As this option is for transitions into Manston, there is no affect below 1,000ft. In addition to this, the proposed option is solely located over the sea. No change to the Do Minimum option.	As this option is for transitions into Manston, there is no affect below 1,000ft. No change to the Do Minimum option.	As this option is for transitions into Manston, there is no affect below 1,000ft. No change to the Do Minimum option.	Aircraft flying a visual approach are more likely to require higher power settings than those conducting automated approaches. This has a significant impact on the air quality. Furthermore, as more missed approaches will likely be carried out, this further reduces air quality, especially within the immediate vicinity of the airport.
Wider Society	Greenhouse Gas impact	Initial Options Appraisal: Qualitative	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 rack 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, although it is slightly further than the following option. 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 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 rack 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, although it is slightly further than the following option. 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 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.	As there is no way to predict or efficiently manage arriving traffic with this option, there is a likelihood of increased track mileage and therefore increased emissions. Furthermore, such approaches increased the likelihood of missed approaches leading to additional approaches and increased track miles and hence emissions.
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 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 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 north and east, 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.	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 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 north and east, 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.	This option provides limited capacity or resilience as there is no consistency in terms of managing approaches into Manston.
General Aviation	Access	Initial Options Appraisal: Qualitative	This route would have minimal impact on other airspace users.	This option does not impose any major restrictions on GA access, although it is worth noting that the area is used extensively for gliding operations, specifically from Challock airfield.	This route would have minimal impact on other airspace users.	This route would have minimal impact on other airspace users.	This option does not impose any major restrictions on GA access, although it is worth noting that the area is used extensively for gliding operations, specifically from Challock airfield.	This route would have minimal impact on other airspace users.	Although this option would not restrict GA access to airspace but it is slightly limiting as there is no consistency in terms of handling GA traffic on arrival into Manston.
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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.	The economic impact assisted with this option is negative as aircraft may be required to burn more fuel (and therefore cost) as there would be no standardised or consistent method of handling aircraft inbound to Manston.
General Aviation / commercial airlines	Fuel burn	Initial Options Appraisal: Qualitative	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. 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. Less impact than the Do Minimum option.	Due to the lack of consistency associated with this option, there is likely to be a significant increase in track milage flown, thereby increase fuel burn.
Commercial airlines	Training costs	Initial Options Appraisal: Qualitative	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.
Commercial airlines	Other costs	Initial Options Appraisal: Qualitative	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.
Airport / Air navigation service provider	Infrastructure costs	Initial Options Appraisal: Qualitative	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.
Airport / Air navigation service provider	Operational costs	Initial Options Appraisal: Qualitative	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.
Airport / Air navigation service provider	Deployment costs	Initial Options Appraisal: Qualitative	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.
Safety Assessment	Safety Assessment	Initial Options Appraisal: Qualitative	No significant safety implications were identified during the safety assessment. The procedure is close to the current and proposed Southend CTAs. 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.	Southernmost Transition option commensurate with airspace used for aerobatic activities associated with gliders from Challock airfield. Potential conflict between heavy transport aircraft and gliders. Unable to adequately mitigate: gliders may not be radio equipped and an LOA/MOU not likely to offer robust separation between Manston and Challock traffic.	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. 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.	Southernmost Transition option commensurate with airspace used for aerobatic activities associated with gliders from Challock airfield. Potential conflict between heavy transport aircraft and gliders. Unable to adequately mitigate: gliders may not be radio equipped and an LOA/MOU not likely to offer robust separation between Manston and Challock traffic.	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

Group	Impact	Level of Analysis	RWY 28 ILS/RNAV MAP North (Eastern)	RWY 28 ILS/RNAV MAP North (Western)	RWY 28 ILS/RNAV MAP South	RWY 10 ILS/RNAV 2,500ft Approach MAP North
		Summary of Analysis	Minimum practicable impact from approach. MAP minimises noise impact and although slightly longer than the southern MAP option, most of the procedure is 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. Longest 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.	Rejected - Minimum practicable impact from approach. Greater noise impact of the missed approach due to further overland track and proximity to larger built-up areas. Represents shortest track miles therefore minimal fuel burn and emissions. Safety impact with gliders. Rejected on safety grounds.	Minimum noise impact and minimum track miles, reducing emissions. Eastern Initial Approach Segment significant safety impact with gliders so this aspect of the procedure rejected, retaining the south western Initial Approach Segment. Potential to move the Hold position away from the Windfarm whilst remaining over the sea.
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 overflies sparsely populated areas, having a limited noise impact on local communities in terms of noise until the aircraft heads 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.	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 overflies sparsely populated areas, although it does fly closer to the village of St Nicholas-At-Wade (compared to the previous option) until the aircraft heads 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.	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. However, in terms of the MAP, although this option flies over sparsely populated areas, compared to previous options, there is an extended overflight of land which passes close to many villages before reaching 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 likely to be greater with extended overland track and more concentrated than the Do Minimum option.	Aircraft joining the approach from the north will remain over the sea. However, aircraft will join the approach from the south overland in an area with numerous small villages and hamlets. The final approach segments do overfly the town of Herne Bay, but this is unavoidable due to the location and orientation of the RWY. Likewise, the MAP would overfly Ramsgate, which is unavoidable due to its position in relation to the RWY. 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.
Communities	Air Quality	Initial Options Appraisal: Qualitative	There will be an impact on Local Air Quality on Ramsgate from aircraft flying this approach procedure. Ramsgate is only 2.3 nautical miles from touchdown, so overflight below 1,000 ft is unavoidable. The MAP will have an impact on Local Air Quality, although over a sparsely populated area. No change to the Do Minimum option.	There will be an impact on Local Air Quality on Ramsgate from aircraft flying this approach procedure. Ramsgate is only 2.3 nautical miles from touchdown, so overflight below 1,000 ft is unavoidable. The MAP will have an impact on Local Air Quality. Although over a sparsely populated area, the route is closer to the village of St Nicholas-At-Wade than the previous option. No change to the Do Minimum option.	There will be an impact on Local Air Quality on Ramsgate from aircraft flying this approach procedure. Ramsgate is only 2.3 nautical miles from touchdown, so overflight below 1,000 ft is unavoidable. The MAP will have an impact on Local Air Quality. Although sparsely populated, the route is closer to a number of villages and hamlets that will be impacted. No change to the Do Minimum option.	There will be an impact on Local Air Quality as aircraft descend below 1,000 ft on the final approach. Although generally over a sparsely populated area, aircraft will overfly the village of St Nicholas-At-Wade below 1,000 ft, which is unavoidable due to the position of the village in relation to the runway. The MAP will overfly the town of Ramsgate below 1,000 ft, which will have an impact on the Local Air Quality. No change to the Do Minimum option.
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 Missed Approach Procedure is slightly longer (1.9 miles) than the southern option. The MAP is an emergency 'go-around' 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 is slightly longer (1.8 miles) than the southern option. The MAP is an emergency 'go-around' 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 'go-around' 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 'go-around' 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.
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 from the east, 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 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 south, This enables increased capacity and efficiency.	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.
General Aviation	Access	Initial Options Appraisal: Qualitative	This route would have minimal impact on other airspace users.	This route would have minimal impact on other airspace users.	This route would have minimal impact on other airspace users.	Although this procedure does not impose any restrictions on access for GA, the final approach track is only 1.5 nautical miles north of Maypole Airfield. The location of the hold would be restrictive to GA traffic transiting across the Thames Estuary, who are already constrained by Southend Airport CTA, Shoeburyness Danger Area and the London Array TMZ.
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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.
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 is slightly further than the southern 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 is slightly further than the southern 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 is shorter than the other options with an associated decrease 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.
Commercial airlines	Training costs	Initial Options Appraisal: Qualitative	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.
Commercial airlines	Other costs	Initial Options Appraisal: Qualitative	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.
Airport / Air navigation service provider	Infrastructure costs	Initial Options Appraisal: Qualitative	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.
Airport / Air navigation service provider	Operational costs	Initial Options Appraisal: Qualitative	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.
Airport / Air navigation service provider	Deployment costs	Initial Options Appraisal: Qualitative	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.
Safety Assessment	Safety Assessment	Initial Options Appraisal: Qualitative	No significant safety implications were identified during the safety assessment. Aircraft executing the MAP will require a deconfliction service to be provided by Manston ATC for separation with other traffic. An LOA/MOU agreement between Manston Airport and Maypole airfield will mitigate any potential conflict between heavy transport and GA aircraft. 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. Aircraft executing the MAP will require a deconfliction service to be provided by Manston ATC for separation with other traffic. An LOA/MOU agreement between Manston Airport and Maypole airfield will mitigate any potential conflict between heavy transport and GA aircraft. 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.	Safety conflict with gliders in Class G airspace. MAP routes overland through an area used by gliders from Waldershare airfield quoted as operating up to [the base of CAS] 7, 000 ft (QNH). Gliders not detectable by Primary Surveillance Radar and unlikely to be transponder/ radio equipped. Unable to adequately mitigate: gliders may not be radio equipped and an LOA/MOU not likely to offer robust separation between Manston and Waldershare traffic.	Safety conflict with gliders in Class G airspace. The southernmost Initial Approach Segment commensurate with airspace used for aerobatic activities associated with gliders from Challock airfield. Potential conflict between heavy transport aircraft and gliders. Unable to adequately mitigate: gliders may not be radio equipped and an LOA/MOU not likely to offer robust separation between Manston and Challock traffic. The Hold is close to the current and proposed Southend CTAs as well as being positioned overhead the Kentish Flats 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.

Group	Impact	Level of Analysis	RWY 10 ILS/RNAV 2,500ft Approach MAP South	RWY 10 ILS/RNAV 3,000ft Approach MAP North	RWY 10 ILS/RNAV 3,000ft Approach MAP South	NDB Hold Baseline (Do Minimum)
		Summary of Analysis	Rejected - Minimum practicable impact from approach. Missed approach has greater noise impact due to further overland track and proximity to larger built-up areas. Represents shortest track miles therefore minimal fuel burn and emissions. MAP and Hold position has significant safety impact with gliders. Rejected on safety grounds.	Minimum noise impact and minimum track miles, reducing emissions. Eastern Initial Approach Segment significant safety impact with gliders so this aspect of the procedure rejected, retaining the south western Initial Approach Segment. 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 due to further overland track and proximity to larger built-up areas. Represents shortest track miles therefore minimal fuel burn and emissions. MAP and Hold position has significant safety impact with gliders. Rejected on safety grounds.	Aircraft will be required to hold VFR away from the airport, potentially increasing the noise impact in the local area. Aircraft will hold for the minimum amount of time, reducing the impact of 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.
Communities	Noise impact on health and quality of life	Initial Options Appraisal: Qualitative	Aircraft joining the approach from the north will remain over the sea. However, aircraft will join the approach from the south overland in an area with numerous small villages and hamlets. The final approach segments do overfly the town of Herne Bay, but this is unavoidable due to the location and orientation of the RWY. Likewise, during a MAP aircraft would overfly Ramsgate, which is unavoidable due to its position in relation to the RWY. Additionally, the overland transit to the hold will have a noise impact on rural areas in East Kent. 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. Noise impact of MAP likely to be greater with extended overland track and more concentrated than the Do Minimum option.	Aircraft joining the approach from the north will remain over the sea. However, aircraft will join the approach from the south overland in an area with numerous small villages and hamlets. The final approach segments do overfly the town of Herne Bay, but this is unavoidable due to the location and orientation of the RWY. Likewise, during a MAP aircraft would overfly Ramsgate, which is unavoidable due to its position in relation to the RWY. 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.	Aircraft joining the approach from the north will remain over the sea. However, aircraft will join the approach from the south overland in an area with numerous small villages and hamlets. The final approach segments do overfly the town of Herne Bay, but this is unavoidable due to the location and orientation of the RWY. Likewise, during a MAP aircraft would overfly Ramsgate, which is unavoidable due to its position in relation to the RWY. Additionally, the overland transit to the hold will have a noise impact on rural areas in East Kent. 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. Noise impact of MAP likely to be greater with extended overland track and more concentrated than the Do Minimum option.	With this option, aircraft holding will vary, therefore the noise impact cannot be confined to sparsely populated areas. Aircraft operating on VFR could even be as low as 500ft, increasing noise levels over the surrounding areas.
Communities	Air Quality	Initial Options Appraisal: Qualitative	There will be an impact on Local Air Quality as aircraft descend below 1,000 ft on the final approach. Although generally over a sparsely populated area, aircraft will overfly the village of St Nicholas-At-Wade below 1,000 ft, which is unavoidable due to the position of the village in relation to the runway. The MAP will overfly the town of Ramsgate below 1,000 ft, which will have an impact on the Local Air Quality. No change to the Do Minimum option.	There will be an impact on Local Air Quality as aircraft descend below 1,000 ft on the final approach. Although generally over a sparsely populated area, aircraft will overfly the village of St Nicholas-At-Wade below 1,000 ft, which is unavoidable due to the position of the village in relation to the runway. The MAP will overfly the town of Ramsgate below 1,000 ft, which will have an impact on the Local Air Quality. No change to the Do Minimum option.	There will be an impact on Local Air Quality as aircraft descend below 1,000 ft on the final approach. Although generally over a sparsely populated area, aircraft will overfly the village of St Nicholas-At-Wade below 1,000 ft, which is unavoidable due to the position of the village in relation to the runway. The MAP will overfly the town of Ramsgate below 1,000 ft, which will have an impact on the Local Air Quality. No change to the Do Minimum option.	Aircraft only hold for the minimum amount of time necessary, so there is a limited air quality impact.
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 Missed Approach Procedure represents the minimum practicable track miles flown. The MAP is an emergency 'go-around' 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 'go-around' 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 'go-around' 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.
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 from the west, This enables increased capacity and efficiency.	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, enabling increased capacity and 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, enabling increased capacity and efficiency.	This option offers very little capacity or resilience benefits with no standardised holding process in place.
General Aviation	Access	Initial Options Appraisal: Qualitative	Although this procedure does not impose any restrictions on access for GA, the final approach track is only 1.5 nautical miles north of Maypole Airfield. The location of the hold would be restrictive to gliding operations at Challock Airfield and Kent Gliding Club would be affected.	Although this procedure does not impose any restrictions on access for GA, the final approach track is only 1.5 nautical miles north of Maypole Airfield. The location of the hold would be restrictive to GA traffic transiting across the Thames Estuary, who are already constrained by Southend Airport CTA, Shoeburyness Danger Area and the London Array TMZ.	Although this procedure does not impose any restrictions on access for GA, the final approach track is only 1.5 nautical miles north of Maypole Airfield. The location of the hold would be restrictive to gliding operations at Challock Airfield and Kent Gliding Club would be affected.	This route would have minimal impact on other airspace users. However, in line with the Airspace Modernisation Strategy, efforts should be made to improve situational awareness outside controlled airspace. This option does not.
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 for airlines and general aviation.	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 for airlines and general aviation.	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 for airlines and general aviation.	There will be a limited economic impact associated with this option, although additional track milage (and therefore cost) may be required based on the 'See and Avoid' principle.
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.	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.	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.
Commercial airlines	Training costs	Initial Options Appraisal: Qualitative	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.
Commercial airlines	Other costs	Initial Options Appraisal: Qualitative	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Due to the scale of operations, some cost may be incurred to create operational procedures specific to Manston if required.	
Airport / Air navigation service provider	Infrastructure costs	Initial Options Appraisal: Qualitative	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	
Airport / Air navigation service provider	Operational costs	Initial Options Appraisal: Qualitative	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.
Airport / Air navigation service provider	Deployment costs	Initial Options Appraisal: Qualitative	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.
Safety Assessment	Safety Assessment	Initial Options Appraisal: Qualitative	Safety conflict with gliders in Class G airspace. The southernmost Initial Approach Segment commensurate with airspace used for aerobatic activities associated with gliders from Challock airfield. The Hold is positioned overhead Challock airfield and airspace used for gliding activities. Potential conflict between heavy transport aircraft and gliders. Unable to adequately mitigate: gliders may not be radio equipped and an LOA/MOU not likely to offer robust separation between Manston and Challock traffic. The Hold is also positioned close to the London TMA, with the potential for CAS infringement.	Safety conflict with gliders in Class G airspace. The southernmost Initial Approach Segment commensurate with airspace used for aerobatic activities associated with gliders from Challock airfield. Potential conflict between heavy transport aircraft and gliders. Unable to adequately mitigate: gliders may not be radio equipped and an LOA/MOU not likely to offer robust separation between Manston and Challock traffic. The Hold is very close to the current and proposed Southend CTAs and Shoeburyness Danger Area D138, with significant risk that aircraft could infringe this airspace. Hold is also positioned overhead the Kentish Flats 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.	Safety conflict with gliders in Class G airspace. The southernmost Initial Approach Segment commensurate with airspace used for aerobatic activities associated with gliders from Challock airfield. The Hold is positioned overhead Challock airfield and airspace used for gliding activities. Potential conflict between heavy transport aircraft and gliders. Unable to adequately mitigate: gliders may not be radio equipped and an LOA/MOU not likely to offer robust separation between Manston and Challock traffic. The Hold is also positioned close to the London TMA, with the potential for CAS infringement.	No significant safety implications were identified during the safety assessment.

Group	Impact	Level of Analysis	NDB Hold North East	NDB Hold North West	NDB Hold South West	Regulated Airspace (Do Minimum)	Aerodrome Traffic Zone (ATZ)
		Summary of Analysis	Rejected - greater noise impact than the south west option.	Rejected - greater noise impact than the south west option.	Hold situated over sparsely populated areas, minimising noise impact. Aircraft will hold for the minimum amount of time, reducing the impact of emissions. Hold will not be used when commercial aircraft are inbound on an approach procedure due to possible conflict with the MAP.	Rejected - 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. Unlikely to cause funnelling of aircraft or have a significant impact on GA versus the introduction of CAS Required to provided protection of aircraft during critical stages of flight when arriving, departing or flying in the vicinity of the airport.
Communities	Noise impact on health and quality of life	Initial Options Appraisal: Qualitative	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.	For this option, aircraft would be required to hold over the outskirts of Birchington meaning there will be a noise impact to some degree for certain households in Birchington. Other than Birchington, the remainder of this hold flies over sparsely populated areas. Greater noise impact than the Do Minimum option.	For this option, aircraft would be required to hold around the outskirts of Cliffs End, Minster and Monkton (including the turning portion of the hold). Other than the identified areas, the remainder of this hold flies over sparsely populated areas. 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 sparsely populated area so likely to be less people affected than the Do Minimum option.	There will be no noise impact associated with this option.	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	The hold will be flown at 2,000 ft so there will be no impact on the Local Air Quality. 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. 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. No change to the Do Minimum option.	There will be no air quality impact associated with this option.	An ATZ will allow for a greater distribution of air traffic in the vicinity of Manston, which will spread the impact over a wider area as opposed to a more confined area around the airport itself. No change to the Do Minimum option.
Wider Society	Greenhouse Gas impact	Initial Options Appraisal: Qualitative	The use of the NDB hold by GA aircraft may increase airborne time and track miles flown resulting in an increase in emissions. No change to the Do Minimum option.	The use of the NDB hold by GA aircraft may increase airborne time and track miles flown resulting in an increase in emissions. No change to the Do Minimum option.	The use of the NDB hold by GA aircraft may increase airborne time and track miles flown resulting in an increase in emissions. No change to the Do Minimum option.	There will be no greenhouse gas impact associated with this option.	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 Hold procedure meets the aims of the Airspace Modernisation Strategy by providing modernisation and increase situational awareness outside controlled airspace. This option offers increased capacity and resilience.	This Hold procedure meets the aims of the Airspace Modernisation Strategy by providing modernisation and increase situational awareness outside controlled airspace. This option offers increased capacity and resilience.	This Hold procedure meets the aims of the Airspace Modernisation Strategy by providing modernisation and increase situational awareness outside controlled airspace. This option offers increased capacity and resilience.	This option does not provide capacity or resilience for Manston and does not meet the goals of the Airspace Modernisation Strategy. Any aircraft movements would be disjointed and unevenly spread.	The introduction of an ATZ will greatly increase the amount of capacity and resilience available. Aircraft movements will be more spread out and managed in an effective way compared to existing arrangements.
General Aviation	Access	Initial Options Appraisal: Qualitative	This route would have minimal impact on other airspace users.	This route would have minimal impact on other airspace users.	This route would have minimal impact on other airspace users.	This route would have minimal impact on other airspace users.	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 Class G airspace arrangements.
General Aviation / commercial airlines	Economic impact from increased effective capacity	Initial Options Appraisal: Qualitative	No change to the baseline.	No change to the baseline.	No change to the baseline.	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 a greater number of movements will be handled in a more efficient way due to the procedures and surveillance associated with an ATZ.
General Aviation / commercial airlines	Fuel burn	Initial Options Appraisal: Qualitative	Any holding pattern requires a greater amount of fuel burn to some degree, simply by it's very nature of aircraft circling the skies prior to landing. This option is in close proximity to Manston, so fuel burn assisted with transit between the hold and the airfield is minimised, resulting in reduced fuel burn. No change to the Do Minimum option.	Any holding pattern requires a greater amount of fuel burn to some degree, simply by it's very nature of aircraft circling the skies prior to landing. This option is in close proximity to Manston, so fuel burn assisted with transit between the hold and the airfield is minimised, resulting in reduced fuel burn. No change to the Do Minimum option.	Any holding pattern requires a greater amount of fuel burn to some degree, simply by it's very nature of aircraft circling the skies prior to landing. This option is in close proximity to Manston, so fuel burn assisted with transit between the hold and the airfield is minimised, resulting in reduced fuel burn. No change to the Do Minimum option.	Within un-regulated airspace, there is an increased likelihood of additional fuel burn caused by the needs for aircraft to carry out avoidance action or fly greater track mileage to avoid conflicts.	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. Possible small positive impact to the Do Minimum option if GA fly at a higher altitude.
Commercial airlines	Training costs	Initial Options Appraisal: Qualitative	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.	At this stage, the development of Manston Airport is too immature to consider airline training costs.
Commercial airlines	Other costs	Initial Options Appraisal: Qualitative	The use of the NDB hold would be for GA aircraft only. No associated cost to commercial airlines with the introduction of the hold.	The use of the NDB hold would be for GA aircraft only. No associated cost to commercial airlines with the introduction of the hold.	The use of the NDB hold would be for GA aircraft only. No associated cost to commercial airlines with the introduction of the hold.		No associated cost to commercial airlines with the introduction of an ATZ.
Airport / Air navigation service provider	Infrastructure costs	Initial Options Appraisal: Qualitative	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.	The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.		The cost assisted with realising this specific option is out of scope. Infrastructure to provide ATS and CNS equipage is within the scope of the wider Manston Airport Development Programme.
Airport / Air navigation service provider	Operational costs	Initial Options Appraisal: Qualitative	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.	Operational costs are not predicted to vary by individual option.
Airport / Air navigation service provider	Deployment costs	Initial Options Appraisal: Qualitative	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.	Development costs are not predicted to vary by individual option.
Safety Assessment	Safety Assessment	Initial Options Appraisal: Qualitative	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.	No significant safety implications were identified during the safety assessment.	No significant safety implications were identified during the safety assessment.