STIRLINGX

Airspace Change Proposal

Norwich BVLOS Regulatory Sandbox – Stage 4 (Update and Submit)

Version 0.2

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Document Control

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Section 1 Executive Summary and Introduction

1.1 Executive Summary

This document constitutes the Stage 4 ("Update and Submit") Airspace Change Proposal (ACP) for the Vanguard Beyond Visual Line of Sight (BVLOS) Sandbox Temporary Reserved Area (TRA) and associated Transponder Mandatory Zone (TMZ). The proposal is submitted in accordance with the Airspace Change Process defined in CAP1616 (Edition g).

The Change Sponsor for this proposal is StirlingX Limited. This submission has been prepared by Global Aviation Specialists Limited, acting as an independent aviation consultancy on behalf of the Change Sponsor.

The Vanguard BVLOS Sandbox is a multi-phase regulatory trial designed to support the safe integration of BVLOS unmanned aircraft systems into UK airspace. Phase 4 of the sandbox ("Accommodation") represents a transition from reliance on visual observer mitigation towards the validation of airspace-based strategic mitigations. To support this phase, StirlingX proposes the establishment of a temporary, tactically activated TRA supported by a TMZ, activated by NOTAM and managed in coordination with Norwich Air Traffic Control (ATC).

The proposed airspace construct is temporary and time-limited, does not introduce permanent changes to airspace classification, and is intended solely to enable sandbox trial activity under controlled and reversible conditions. Activation is limited to defined periods and may be suspended or cancelled at any time to accommodate other airspace users, emergency services, or operational priorities.

Stakeholder engagement has been conducted in accordance with CAP1616 and completed prior to this Stage 4 submission.

Engagement has also formed part of a structured, multi-year programme of regional stakeholder dialogue commencing in 2021 through the East Anglia Airspace Users Working Group (EAAUWG). This iterative engagement included military, civilian, emergency service, and specialist aviation stakeholders and informed the evolution of the airspace design principles presented in this submission.

Engagement identified a small number of localised operational concerns, which were addressed through clarification, refinement of the proposal, and formal coordination arrangements. No unresolved objections remain. A full record of stakeholder engagement is provided in the Stakeholder Engagement Report, which can be found in Appendix C.

This Stage 4 submission presents the finalised airspace design and supporting evidence, demonstrating that the proposal is sufficiently mature for assessment at Stage 5 of the Airspace Change Process.

1.2 Introduction

This Stage 4 Airspace Change Proposal sets out the final proposal for the Vanguard BVLOS Sandbox Temporary Reserved Area and associated Transponder Mandatory Zone following completion of consultation and stakeholder engagement undertaken during earlier stages of the ACP process.

The purpose of this submission is to:

- Present the final airspace design.
- Demonstrate how stakeholder feedback has been considered and addressed.
- Confirm that engagement has been completed and closed.
- Provide the Civil Aviation Authority with sufficient information to undertake a Stage 5 assessment of the proposal.

The proposal supports Phase 4 of the Vanguard BVLOS Sandbox and introduces a temporary, tactically activated airspace construct**,** rather than a permanent change to airspace classification, instrument flight procedures, or ATS unit organisation.

The TRA/TMZ will be activated by NOTAM and managed in coordination with Norwich ATC, ensuring predictable and controlled use of the airspace during BVLOS trial activity.

This submission should be read alongside the supporting documentation listed in the Appendices to this document, including:

- The Concept of Operations (ConOps).
- The Specific Operations Risk Assessment (SORA) summary and associated safety documentation.
- The Stakeholder Engagement Report.
- Letters of Agreement with Norwich ATC, emergency services, and military stakeholders.

Together, these documents provide the full technical, safety, and engagement context for the proposed airspace change.

Section 2 Description of the Proposed Airspace Change

2.1 Overview of the Proposed Change

The proposed airspace change is the establishment of a Temporary Reserved Area (TRA) supported by an associated Transponder Mandatory Zone (TMZ) to enable Phase 4 ("Accommodation") operations of the Vanguard Beyond Visual Line of Sight (BVLOS) Sandbox.

The TRA/TMZ is intended to provide a temporary, tactically activated airspace construct that supports BVLOS unmanned aircraft operations without reliance on visual observer mitigation, while maintaining safety for other airspace users. The airspace will be activated only when required for BVLOS trial activity and will be deactivated when not in use.

The proposal does not introduce a permanent change to airspace classification, does not alter existing controlled airspace boundaries, and does not modify published instrument flight procedures. The underlying airspace classification remains unchanged outside periods of activation.

2.2 Nature of the Airspace Change

The proposed change comprises:

- A Temporary Reserved Area (TRA), established for defined periods to support BVLOS sandbox operations; and
- An associated Transponder Mandatory Zone (TMZ), providing equipage-based access control during activation.

The TRA/TMZ will be activated tactically via NOTAM, specifying the geographic extent, vertical limits, activation times, and applicable operating conditions. Activation will be coordinated with the relevant Air Navigation Service Provider, Norwich Air Traffic Control (ATC).

The TRA/TMZ will function as a cooperative traffic environment during activation, ensuring that participating and transiting aircraft are appropriately equipped and that traffic information can be provided by ATC where applicable.

2.3 Geographic and Vertical Extent

The proposed TRA/TMZ is located within the vicinity of the Vanguard BVLOS Sandbox operating area in Norfolk. The geographic footprint and vertical limits of the airspace are defined to:

- Encompass the BVLOS operating volume required for the sandbox trial.
- Minimise the volume of airspace affected.

- Avoid unnecessary interaction with known high-density aviation activity where practicable.

The vertical limits of the TRA/TMZ are set to ensure effective separation between BVLOS operations and typical crewed aviation activity, while remaining proportionate to the operational requirements of the trial. Precise lateral and vertical boundaries are defined in the supporting airspace design documentation provided in the appendices to this submission.

2.4 Purpose of the Airspace Change

The purpose of the proposed airspace change is to support the safe and controlled conduct of BVLOS operations as part of the Vanguard BVLOS Sandbox, specifically to:

- Validate airspace-based strategic mitigations for BVLOS operations.
- Enable removal of visual observer mitigation while maintaining safety.
- Gather operational and safety data to inform future BVLOS integration policy.

The proposed TRA/TMZ provides a reversible and proportionate mechanism to trial BVLOS operations under controlled conditions without committing to permanent airspace restructuring.

2.5 Operational Use of the Airspace

During periods of activation, the TRA/TMZ will be used exclusively to support approved BVLOS sandbox operations conducted by StirlingX in accordance with the approved Concept of Operations and Specific Operations Risk Assessment.

Activation will be:

- Limited in duration.
- Pre-notified via NOTAM.
- Coordinated with Norwich ATC.
- Subject to immediate suspension or cancellation if required to accommodate emergency services, military activity, or other safety considerations.

When the TRA/TMZ is not active, the airspace will revert fully to its existing classification and use, with no additional restrictions imposed.

2.6 Relationship to Existing Airspace Structures

The proposed airspace change is designed to integrate with existing airspace structures and procedures without adverse impact. It does not:

- Alter the classification of controlled or uncontrolled airspace on a permanent basis.
- Affect published ATS routes or instrument flight procedures.
- Require changes to existing ATS unit responsibilities outside periods of activation.

The proposal has been developed in close coordination with Norwich ATC and relevant stakeholders to ensure compatibility with existing airspace management arrangements.

2.7 Summary

In summary, the proposed airspace change introduces a temporary, tactically activated TRA/TMZ to support BVLOS sandbox operations under controlled and reversible conditions. The proposal is proportionate, limited in scope and duration, and designed to minimise impact on other airspace users while enabling critical validation of BVLOS integration concepts.

Section 3 Operational Justification

3.1 Requirement for the Airspace Change

The proposed Temporary Reserved Area (TRA) and associated Transponder Mandatory Zone (TMZ) are required to enable Phase 4 ("Accommodation") of the Vanguard Beyond Visual Line of Sight (BVLOS) Sandbox**.**

This phase represents a deliberate progression from earlier sandbox activity by removing reliance on visual observer mitigation and instead validating airspace-based strategic mitigations**.**

Existing airspace arrangements do not provide a sufficiently controlled operating environment to safely conduct BVLOS operations without visual observers while maintaining an acceptable level of safety for other airspace users.

In particular, the absence of a cooperative traffic environment and the limited ability to manage traffic density and equipage in Class G airspace constrain the ability to progress BVLOS integration objectives.

The proposed airspace change provides a proportionate and reversible mechanism to address these limitations.

3.2 Operational Need and Objectives

The operational need for the proposed airspace change is driven by the requirement to:

- Conduct BVLOS operations beyond the limits of visual observer mitigation.
- Validate the effectiveness of airspace-based strategic mitigations, including traffic equipage requirements and ATC coordination.
- Gather operational, safety, and performance data to inform future BVLOS policy and integration decisions.
- Demonstrate scalable concepts for BVLOS accommodation within existing UK airspace structures.

The Vanguard BVLOS Sandbox is intended to support regulatory learning rather than routine commercial operations. The airspace change is therefore designed specifically to enable controlled trial activity rather than to establish enduring operational privileges.

3.3 Limitations of Existing Arrangements

Under existing arrangements, BVLOS operations rely on a combination of visual observers, tactical detect-and-avoid systems, and procedural mitigations. While suitable for earlier phases, these measures do not adequately support the objectives of Phase 4, which seeks to remove visual mitigation and assess alternative means of ensuring airspace safety.

Without the proposed TRA/TMZ:

- It would not be possible to manage encounter rates and traffic equipage reliably.
- BVLOS operations would remain constrained by visual observer coverage.
- The ability to test and validate airspace-based mitigation concepts would be limited.

As such, existing arrangements are insufficient to support the progression of the sandbox objectives.

3.4 Justification for a Temporary and Tactical Airspace Construct

The proposed airspace change has been deliberately designed as a temporary and tactically activated construct, rather than a permanent change to airspace classification or structure. This approach is justified because:

- The activity is experimental and time limited.
- The airspace change is required only for defined periods of BVLOS trial activity.
- Flexibility is required to suspend or cancel activity in response to other airspace user needs.
- Regulatory learning can be achieved without committing to permanent segregation.

The use of a TRA supported by a TMZ allows the Change Sponsor and the CAA to evaluate BVLOS accommodation concepts under controlled conditions while preserving reversibility.

3.5 Integration with Air Traffic Services

Operational justification for the proposed airspace change is reinforced by its integration with existing Air Traffic Services. Coordination with Norwich Air Traffic Control ensures that:

- Activation of the TRA/TMZ is managed within established ATS procedures.
- Traffic information and coordination can be provided during activation.
- Emergency and state aircraft retain priority access at all times.
- BVLOS activity can be suspended immediately if required.

This integration provides an additional layer of assurance and supports safe coexistence between BVLOS and crewed aviation during the trial.

3.6 Alignment with Strategic Objectives

The proposed airspace change aligns with broader UK objectives to enable the safe integration of unmanned aircraft into the airspace system while maintaining safety for all users. By supporting the Vanguard BVLOS Sandbox, the proposal contributes to:

- Development of evidence-based BVLOS policy.
- Identification of practical, scalable mitigation measures.
- Reduction of barriers to future BVLOS operations where appropriate.

The temporary nature of the proposal ensures that strategic learning can be achieved without disproportionate impact on other airspace users.

3.7 Summary

In summary, the proposed TRA/TMZ is operationally justified as it provides the only proportionate and effective means of enabling Phase 4 BVLOS sandbox operations. Existing arrangements are insufficient to support the objectives of the trial, and a temporary, tactically activated airspace construct offers a controlled, reversible solution that balances innovation with safety and stakeholder considerations.

Section 4 Airspace Design

4.1 Overview of the Airspace Design

The proposed airspace design comprises a Temporary Reserved Area (TRA) supported by an associated Transponder Mandatory Zone (TMZ)**.** The design has been developed specifically to support Phase 4 ("Accommodation") of the Vanguard BVLOS Sandbox and to enable Beyond Visual Line of Sight (BVLOS) operations without reliance on visual observer mitigation.

The design is intended to be temporary, proportionate, and reversible**,** providing a controlled operating environment during defined periods of sandbox activity while minimising impact on other airspace users when not active.

4.2 Design Principles

The airspace design has been developed in accordance with the following principles:

Proportionality: The volume of airspace affected is limited to that strictly necessary to support the BVLOS trial activity.

Temporality: The airspace is activated only when required and reverts to its existing use when not active.

Safety: The design supports the implementation of strategic mitigations identified in the SORA, including traffic equipage and ATC coordination.

Compatibility: The design integrates with existing airspace structures and Air Traffic Services without requiring permanent changes.

Flexibility: Sectorization arrangements allow for accommodation of emergency, military, or other priority operations.

These principles have been applied consistently throughout the development of the proposal and were tested through stakeholder engagement.

4.3 Temporary Reserved Area (TRA)

The Temporary Reserved Area provides a defined volume of airspace within which BVLOS operations may be conducted during activation periods. The TRA is designed to:

- Encompass the required operational volume for BVLOS flights conducted as part of the sandbox.
- Contain the lateral and vertical extents necessary to support normal and contingency flight profiles.
- Limit exposure to non-participating traffic during activation.

The TRA is activated tactically via NOTAM for defined periods associated with sandbox operations. Activation details include the geographic boundaries, vertical limits, activation times, and applicable conditions of use.

The TRA does not alter the underlying classification of the airspace outside periods of activation.

4.4 Transponder Mandatory Zone (TMZ)

The Transponder Mandatory Zone overlays the TRA during activation periods and introduces equipage-based access control. The TMZ requires aircraft operating within the activated airspace to be appropriately equipped with a functioning transponder, thereby creating a cooperative traffic environment.

The TMZ supports several key objectives:

- Reduction of encounter rates with non-cooperative traffic.
- Enhancement of situational awareness for both BVLOS operations and Air Traffic Services.
- Support for the strategic air risk mitigations identified in the SORA.

The TMZ is activated concurrently with the TRA via NOTAM and applies only during periods of BVLOS activity.

4.5 Lateral and Vertical Limits

The lateral and vertical limits of the TRA/TMZ have been defined to balance operational requirements with minimisation of impact on other airspace users.

The design:

- Avoids unnecessary inclusion of airspace not required for BVLOS operations.
- Considers known patterns of crewed aviation activity in the region.
- Incorporates buffers to support contingency management.

Precise coordinates, dimensions, and vertical limits are defined in the supporting airspace design documentation included in Appendix E of this submission.

4.6 Activation, Deactivation, and Control

Activation and deactivation of the TRA/TMZ are managed tactically and coordinated with Norwich Air Traffic Control (ATC). Activation is subject to:

- Publication of a NOTAM providing advance notice to airspace users.
- Confirmation of coordination with Norwich ATC.
- Readiness of BVLOS operations in accordance with the approved ConOps and SORA.

Norwich ATC retains authority to suspend or terminate activation at any time in the interests of safety or operational priority. RPAS operations will be suspended if required to accommodate emergency services, military activity, or other priority traffic.

4.7 Interaction with Existing Airspace Structures

The proposed airspace design has been developed to integrate with existing airspace structures and procedures. It does not:

- Introduce permanent changes to airspace classification.
- Affect published ATS routes or instrument flight procedures.
- Require changes to ATS unit responsibilities outside activation periods.

Coordination with Norwich ATC and other stakeholders has ensured that the design is compatible with existing airspace management arrangements.

4.8 Design Evolution and Stakeholder Influence

The proposed airspace design has evolved through structured and iterative stakeholder engagement undertaken from 2021 onwards. Early engagement through the East Anglia Airspace Users Working Group (EAAUWG), hosted by RAF Marham, provided operational insight into regional military, emergency service, and general aviation activity.
Briefings from RAF Marham regarding Lightning Force operations, MATZ integration, and coordination requirements informed consideration of vertical segmentation and activation arrangements.
Engagement with Norwich Airport, emergency services, police aviation representatives, and specialist aviation stakeholders influenced refinement of activation procedures, coordination mechanisms, and proportionality of the TRA/TMZ construct.
The final design reflects these iterative refinements and is supported by formal Letters of Agreement and coordination procedures documented in Appendix D.

4.9 Summary

The proposed airspace design introduces a temporary, tactically activated TRA/TMZ that provides a controlled operating environment for BVLOS sandbox activity.

The design is proportionate, reversible, and integrated with existing airspace management arrangements, and it directly supports the strategic safety and operational objectives of Phase 4 of the Vanguard BVLOS Sandbox.

Section 5 Safety Assessment

5.1 Overview of the Safety Assessment Approach

A comprehensive safety assessment has been undertaken to support the proposed Temporary Reserved Area (TRA) and associated Transponder Mandatory Zone (TMZ) for Phase 4 ("Accommodation") of the Vanguard Beyond Visual Line of Sight (BVLOS) Sandbox.

The safety assessment has been conducted in accordance with the UK Specific Operations Risk Assessment (SORA) methodology and is documented in the Vanguard BVLOS Sandbox SORA summary found in Appendix B. The SORA is supported by a detailed Concept of Operations (ConOps), operational procedures, and formal coordination arrangements with Air Traffic Services, emergency services, and military stakeholders. This can be found in Appendix A. Additionally, a formal tabletop exercise was conducted on January 26th 2026 between StirlingX Flight Ops and Norwich ATC. This Exercise methodically reviewed every hazard identified by Norwich ATC to ensure alignment, acceptable responses and robustness of the response. This exercise along with the NWI Hazard ID, Log, risk assessment and safety validation report, can be found alongside the Norwich ATC Safety Case and TOI document.

This section provides a summary of the safety considerations relevant to the airspace change itself, in accordance with CAP1616 requirements. The full hazard identification, risk classification, mitigation definition, and robustness assessments are provided in the SORA and associated safety documentation.

5.1.1 Relationship Between the ACP and the SORA

The SORA addresses risks arising from both BVLOS operations and the introduction of a temporary airspace construct. The proposed TRA/TMZ is itself a strategic mitigation within the SORA, intended to reduce air risk by controlling traffic access, equipage, and coordination arrangements.

This ACP does not duplicate the SORA but demonstrates how the airspace design supports the safety objectives and mitigations identified within it.

5.2 Scope of the Safety Assessment

The safety assessment considers risks associated with:

- BVLOS unmanned aircraft operations conducted without visual observer mitigation.
- Interaction between unmanned and crewed aircraft within and adjacent to the proposed TRA/TMZ.
- Activation, management, and deactivation of the temporary airspace construct.
- Interface with Air Traffic Services.
- Access requirements and priority arrangements for emergency services and state aircraft.

The assessment considers air risk, ground risk, and organisational and procedural risks relevant to the proposed airspace change.

5.3 Air Risk Assessment

Air risk has been assessed in accordance with the UK SORA methodology, considering the characteristics of the operating environment, background traffic density, and the proposed strategic and tactical mitigations.

The introduction of the TRA/TMZ provides a strategic air risk mitigation by:

- Restricting access to the airspace during activation periods.
- Requiring appropriate aircraft equipage to create a cooperative traffic environment.
- Enabling coordination and traffic information provision by Norwich Air Traffic Control (ATC).
- Reducing the likelihood of encounters with non-cooperative traffic.

The SORA demonstrates that, through the application of these mitigations, the Air Risk Class (ARC) can be reduced to a level compatible with the proposed BVLOS operations. The effectiveness of these mitigations is supported by operational experience from earlier sandbox phases and by surveillance and electronic conspicuity measures described in the ConOps.

5.4 Ground Risk Assessment

Ground risk has been assessed in accordance with the UK SORA methodology, considering the nature of the underlying environment, population density, and the operating profiles of the unmanned aircraft.

The assessment demonstrates that:

- Operations are conducted primarily over low-density environments.
- Operational volumes and contingency volumes are defined and controlled.
- Appropriate ground risk buffers are applied.
- Emergency and contingency procedures are in place to manage abnormal events.

Ground risk mitigations include strategic measures such as operational planning and spatial restrictions, as well as tactical measures including flight termination procedures and emergency landing protocols. These mitigations are listed within the SORA summary and the ConOps.

5.5 Key Safety Risks Relevant to the Airspace Change and Mitigations

The table below summarises the principal safety issues arising specifically from the introduction and operation of the proposed TRA/TMZ, together with the primary mitigations applied. Detailed hazard identification and mitigation robustness assessments are provided in the SORA.

Safety Issue Relevant to Airspace Change	Primary Mitigation(s)	Supporting Reference
Interaction with non-cooperative traffic	TRA/TMZ activation, aircraft equipage requirements, NOTAM publication	SORA summary, ConOps
Increased traffic complexity during activation	ATC coordination, traffic service provision, procedural controls	ConOps, LoA Norwich ATC
Loss of C2 or abnormal UA behaviour	Defined contingency volumes, automated recovery and termination procedures	SORA summary, ConOps,
Activation or deactivation error	Procedural checks, ATC confirmation, NOTAM validation	ConOps
Emergency services or state aircraft access conflict	Priority access retained	LoAs (Emergency Services, Military)

5.6 Operational and Procedural Mitigations

Operational and procedural mitigations form a key component of the overall safety case. These include:

- Defined activation and deactivation procedures for the TRA/TMZ.
- Coordination and communication procedures with Norwich ATC.
- Formalised priority access arrangements for emergency services and military aircraft.
- Crew training, competency management, and procedural compliance.

These mitigations are documented within the ConOps, operational manuals, NWI Safety Case / TOI and Letters of Agreement.

5.7 Integration with Air Traffic Services

The safety assessment explicitly considers the interface between BVLOS operations and Air Traffic Services. Coordination with Norwich ATC ensures that:

- Activation of the TRA/TMZ is managed within established ATS procedures.
- Traffic information and coordination can be provided during activation.
- Emergency and state aircraft retain priority access at all times.
- BVLOS operations can be suspended immediately, if required, in the interests of safety.

The Letter of Agreement and Safety Case / TOI agreed with Norwich ATC provides formal assurance that these arrangements are understood, documented, and supported by the ANSP.

5.8 Summary of Safety Assessment Outcomes

The safety assessment demonstrates that the proposed temporary airspace construct, when combined with the operational, procedural, and technical mitigations described in the supporting documentation, provides an acceptable level of safety for the proposed BVLOS sandbox operations.

All safety risks arising from the introduction and operation of the TRA/TMZ have been identified within the SORA and mitigated to an acceptable level. No additional safety risks specific to the airspace change have been identified beyond those addressed in the supporting safety documentation.

On this basis, the safety assessment supports progression of the Airspace Change Proposal to Stage 5 assessment**.**

Section 6 Consultation and Engagement

6.1 Overview of the Engagement Approach

Consultation and stakeholder engagement for the Vanguard BVLOS Sandbox Temporary Reserved Area (TRA) and associated Transponder Mandatory Zone (TMZ) have been conducted in accordance with the principles and requirements set out in CAP1616.

Engagement was proportionate to the temporary, trial-based nature of the proposed airspace change and focused on aviation stakeholders and organisations with a direct operational interest in the affected airspace. The engagement strategy was designed to ensure that stakeholders were provided with sufficient information to understand the proposal, assess its potential impacts, and provide informed feedback.

A full record of consultation activity, stakeholder correspondence, meeting minutes, presentations, and formal agreements is documented in the Stakeholder Engagement Report, which can be found in Appendix C.

6.2 Identification of Stakeholders

Stakeholders were identified through a structured stakeholder mapping exercise and included, but were not limited to:

- **Air Navigation Service Providers**, including Norwich Air Traffic Control.
- **General aviation representative bodies**, including the National Air Traffic Management Advisory Committee (NATMAC).
- **Local and regional airspace user forums**, including the East of England Airspace Users Working Group (EEAUWG).
- **Local general aviation clubs and airfields,** including Felthorpe Airfield and Norfolk Hang Gliding and Paragliding Club.
- **Military stakeholders**, including RAF Marham and associated units.
- **Emergency services**, including NPAS, local police forces, and air ambulance operators.
- **Specialist aviation users**, including gliding, hang gliding, and paragliding organisations operating within or adjacent to the affected area.
- **Commercial aviation operators** with activity in the vicinity of the proposed airspace.

The stakeholder list was reviewed and refined throughout the engagement process to ensure appropriate coverage.

6.3 Engagement Activities Undertaken

Engagement activities included a combination of:

- Circulation of a formal consultation pack, including explanatory material and airspace design information.
- Presentations and briefings at established stakeholder forums, including NATMAC and EEAUWG.
- Bilateral meetings and correspondence with key stakeholders.
- Direct engagement with Air Traffic Services and emergency services to develop formal coordination arrangements.
- Publication of consultation material and provision of mechanisms for stakeholders to submit feedback.

6.4 Stakeholder Feedback and Key Themes

Feedback received during consultation primarily focused on:

- Awareness and notification of TRA/TMZ activation.
- Interaction with specialist aviation activity, including gliding and recreational flying.
- Access arrangements for emergency services and state aircraft.
- Coordination and communication with Air Traffic Services.

No objections were raised in principle to the proposed airspace change. Where localised concerns were identified, these were addressed through clarification, refinement of procedures, or additional coordination measures.

6.5 Response to Stakeholder Feedback

Stakeholder feedback was reviewed systematically and informed refinements to the proposal and associated procedures. Responses included:

- Clarification of activation, notification, and deactivation arrangements.
- Confirmation of priority access and suspension procedures for emergency and military aircraft.
- Refinement of local buffers and operating practices where appropriate.
- Formalisation of coordination arrangements through Letters of Agreement**.**

The outcomes of this process are documented in the Stakeholder Engagement Report, including evidence of correspondence, meeting records, and agreed resolutions.

6.6 Engagement Outcomes

The engagement process resulted in:

- Confirmation that the proposed airspace change is understood by affected stakeholders.
- Agreement on coordination and access arrangements with Air Traffic Services, emergency services, and military stakeholders.
- No unresolved objections to the proposed TRA/TMZ.

Formal Letters of Agreement with key stakeholders provide assurance that operational interfaces and responsibilities are clearly defined and accepted.

Engagement confirmed that the temporary and proportionate nature of the proposed TRA/TMZ construct was understood and accepted by key operational stakeholders. No fundamental objections were raised, and the final proposal reflects refinements agreed through this iterative process.

6.7 Conclusion of Consultation

Consultation and engagement are considered complete for the purposes of Stage 4 of the Airspace Change Process. The outcomes of engagement support submission of the final Airspace Change Proposal for assessment at Stage 5.

No further engagement is considered necessary prior to CAA assessment, although ongoing communication will continue as part of implementation and monitoring arrangements.

Section 7 Update from Stage 3

7.1 Overview of Stage 3 Activity

Stage 3 of the Airspace Change Process focused on consultation and stakeholder engagement in relation to the proposed Temporary Reserved Area (TRA) and associated Transponder Mandatory Zone (TMZ) for the Vanguard BVLOS Sandbox.

The objectives of Stage 3 were to:

- Present the proposed airspace change to affected stakeholders.
- Explain the purpose, scope, and temporary nature of the proposal.
- Invite feedback on potential impacts and operational considerations.
- Identify and resolve any issues prior to submission of the final proposal.

Stage 3 engagement was undertaken in accordance with the Consultation Strategy and completed prior to submission of this Stage 4 ACP.

7.2 Summary of Stakeholder Engagement Outcomes

Consultation during Stage 3 identified a small number of operational considerations, primarily relating to:

- Awareness and notification of airspace activation.
- Interaction with specialist aviation activity in the local area.
- Coordination and access arrangements for emergency services and military aircraft.

No objections were raised to the principle of the proposed airspace change. Feedback focused on clarification and local operational considerations rather than fundamental concerns regarding safety or proportionality.

All feedback received during Stage 3 has been reviewed and addressed, as documented in the Stakeholder Engagement Report

7.3 Changes Made Since Stage 3

Following completion of Stage 3 consultation, the proposal has been updated and refined to reflect stakeholder feedback and further development of the operational concept. Key updates include:

- Clarification of activation and deactivation procedures for the TRA/TMZ, including ATC coordination requirements.
- Confirmation of priority access and immediate suspension procedures for emergency services and state aircraft.
- Refinement of local operating practices and buffers in response to specialist aviation stakeholder input.

- Formalisation of coordination arrangements through Letters of Agreement with key stakeholders.

These changes are procedural and clarificatory in nature and do not materially alter the scope or intent of the proposed airspace change.

7.4 Assessment of the Need for Further Engagement

In light of the outcomes of Stage 3 consultation and the refinements made to the proposal, no further engagement is considered necessary prior to submission of this Stage 4 ACP.

Stakeholder engagement has been completed, outstanding issues have been resolved, and no unresolved objections remain. Ongoing communication with stakeholders will continue as part of implementation and monitoring arrangements, should the proposal be approved.

7.5 Conclusion

Stage 3 of the Airspace Change Process has been completed in accordance with CAP1616. Feedback received during consultation has informed the final proposal presented in this submission, and the Change Sponsor considers the proposal to be sufficiently mature for assessment at Stage 5.

Section 8 Assessment of Impacts

8.1 Overview

This section assesses the potential impacts arising from the proposed Temporary Reserved Area (TRA) and associated Transponder Mandatory Zone (TMZ) established to support Phase 4 of the Vanguard BVLOS Sandbox.

The assessment considers impacts on airspace users, Air Traffic Services, emergency and state operations, and overall airspace management. Impacts are assessed in the context of the temporary, tactically activated nature of the proposed airspace change.

Environmental and noise impacts are not considered applicable to this proposal and are addressed accordingly.

8.2 Impact on Other Airspace Users

The proposed airspace change introduces a temporary restriction on access to the affected airspace during periods of activation. Potential impacts on other airspace users have been assessed and are mitigated through the following characteristics of the proposal:

- Activation of the TRA/TMZ is limited in duration and occurs only when required for BVLOS sandbox activity.
- Activation is notified in advance via NOTAM, providing transparency and predictability.
- The airspace reverts fully to its existing classification and use when not active.
- Access for appropriately equipped aircraft is retained through the TMZ construct.
- Priority access for emergency services and state aircraft is maintained at all times.

Stakeholder engagement has confirmed that the proposed arrangements are understood and acceptable to affected airspace users. No stakeholders identified impacts that would be disproportionate to the temporary nature of the proposal.

8.3 Impact on Specialist and Recreational Aviation

Specialist and recreational aviation activity, including gliding, hang gliding, paragliding, and general aviation operations, has been considered in the assessment of impacts.

Engagement with representative organisations and local operators identified the importance of:

- Clear activation and notification arrangements.
- Avoidance of unnecessary airspace restriction.
- Flexibility to accommodate local activity where practicable.

These considerations have been addressed through procedural mitigations, NOTAM publication, and coordination arrangements. No residual impacts on specialist aviation activity have been identified that would preclude implementation of the proposal.

8.4 Impact on Air Traffic Services

The proposed airspace change has been developed in close coordination with Norwich Air Traffic Control (ATC). The impact on Air Traffic Services is assessed as manageable and proportionate due to:

- Tactical activation rather than permanent airspace restructuring.
- Defined procedures for activation, coordination, and suspension.
- Clear allocation of responsibilities documented through formal Letters of Agreement.

Norwich ATC retains authority to suspend or terminate the TRA/TMZ at any time in the interests of safety or operational priority. The impact on ATS workload is limited and confined to periods of activation.

8.5 Impact on Emergency Services and State Aircraft

The proposal explicitly preserves access for emergency services and state aircraft. Impacts on these users are mitigated through:

- Retention of priority access at all times.
- Suspension of RPAS operations.
- Formal Letters of Agreement with relevant emergency and military stakeholders.

These arrangements ensure that the proposed airspace change does not adversely affect the ability of emergency services or state aircraft to conduct their operations.

8.6 Environmental and Noise Impacts

The proposed airspace change is temporary, time-limited, and does not introduce new flight paths, permanent changes to airspace classification, or sustained increases in traffic levels.

As such:

- No significant environmental impacts are anticipated.
- No material changes to noise exposure are expected.
- No environmental or noise assessment is considered necessary for this proposal.

This approach is proportionate to the nature and scope of the proposed change.

It is also worth adding that there is a DfT consultation on *noise* taking place, StirlingX have therefore been advised that they are not required to apply environmental or noise considerations.

8.7 Cumulative Impacts

The proposal has been assessed in the context of existing airspace usage and other known activities in the area.

Due to its temporary and reversible nature, the proposed airspace change is not expected to result in cumulative impacts when considered alongside other airspace activities.

8.8 Summary of Impacts

The assessment concludes that:

- Impacts on other airspace users are limited, temporary, and proportionately mitigated.
- Impacts on Air Traffic Services are manageable and confined to activation periods.
- Emergency services and state aircraft access is preserved.
- No significant environmental or noise impacts arise.

On this basis, the impacts associated with the proposed airspace change are considered acceptable and consistent with the objectives of the Vanguard BVLOS Sandbox.

Section 9 Options Appraisal and Rationale

9.1 Basis for Options Considered

In accordance with CAP1616g Appendix A, this section sets out the reasonable alternatives considered in developing the proposed airspace change and explains the rationale for the selected approach.

The options described below were not generated through a standalone options appraisal exercise. Instead, they emerged organically through the development and maturation of the Vanguard BVLOS Sandbox, as documented in the Concept of Operations (ConOps), the Specific Operations Risk Assessment (SORA), and supporting consultation material.

As the sandbox progressed from earlier phases towards Phase 4 ("Accommodation"), successive operational concepts were considered, tested, and either adopted or discounted based on safety, feasibility, and proportionality. This section summarises that progression and demonstrates why the proposed Temporary Reserved Area (TRA) with an associated Transponder Mandatory Zone (TMZ) represents the most appropriate solution.

9.2 Option 1 – Continuation of Phase 3 Arrangements (No Airspace Change)

Earlier phases of the Vanguard BVLOS Sandbox (including Phase 3) relied on a combination of procedural controls, electronic conspicuity, and visual observer mitigation to manage air risk during BVLOS operations.

Continuation of these arrangements without an airspace change was considered as part of the sandbox evolution. This option was discounted because:

- Phase 4 explicitly seeks to remove reliance on visual observer mitigation, which is not achievable under existing arrangements.
- Continued reliance on visual mitigation limits regulatory learning and does not test scalable integration concepts.
- The SORA identifies that, without additional strategic mitigations, air risk cannot be reduced to a level compatible with Phase 4 objectives.

This option is therefore inconsistent with the stated aims of the Vanguard BVLOS Sandbox as documented in the ConOps.

9.3 Option 2 – Procedural Mitigations Without Dedicated Airspace

An alternative approach considered was reliance on procedural mitigations alone, such as enhanced NOTAM usage, briefing, and tactical detect-and-avoid systems, without the establishment of a TRA or TMZ.

This option was examined during development of the ConOps and SORA but was discounted because:

- Procedural mitigations alone do not provide sufficient control over traffic equipage or density in Class G airspace.
- Encounter rates with non-cooperative traffic cannot be reliably reduced.
- The SORA identifies that strategic airspace-based mitigations are required to achieve the desired reduction in Air Risk Class for Phase 4 operations.

While procedural mitigations remain an important element of the overall safety case, they were assessed as insufficient on their own to support the Phase 4 operating concept.

9.4 Option 3 – Permanent or Long-Term Airspace Change

Consideration was given to whether a permanent or long-term airspace change could support BVLOS operations.

This option was discounted early in the sandbox development process because:

- The Vanguard BVLOS Sandbox is explicitly a **temporary, trial-based activity**.
- A permanent change would be disproportionate to the scope, duration, and experimental nature of the operations.
- Permanent airspace restructuring would impose unnecessary long-term constraints on other airspace users.
- The Consultation Strategy and stakeholder engagement materials consistently describe the proposal as reversible and time limited.

A permanent airspace change was therefore considered inappropriate at this stage of regulatory development.

9.5 Option 4 – Temporary Reserved Area with Transponder Mandatory Zone (Preferred Option)

The selected option is the establishment of a temporary, tactically activated Temporary Reserved Area supported by an associated Transponder Mandatory Zone, as described in this ACP.

This option is explicitly described and supported in the ConOps and SORA and was refined through stakeholder engagement. It was selected because it:

- Provides a strategic air risk mitigation by controlling access and equipage during activation.
- Enables removal of visual observer mitigation while maintaining an acceptable level of safety.
- Supports validation of airspace-based mitigation concepts central to Phase 4 objectives.
- Is temporary, reversible, and proportionate to the sandbox activity.

- Minimises impact on other airspace users when not active.
- Has been accepted by key stakeholders through the consultation process.

The TRA/TMZ construct directly supports the safety and operational assumptions underpinning the SORA and aligns with the stated objectives of the Vanguard BVLOS Sandbox.

9.6 Rationale for the Preferred Option

The preferred option represents the minimum necessary airspace intervention required to enable Phase 4 BVLOS operations. It allows for:

- Controlled, cooperative traffic environments during defined periods.
- Integration with Air Traffic Services through established coordination arrangements.
- Suspension in response to emergency, military, or other priority operations.
- Regulatory learning without commitment to permanent airspace change.

No alternative option identified during the sandbox development process provides an equivalent balance of safety, feasibility, and proportionality.

9.7 Summary

The options considered for this proposal arose through the structured evolution of the Vanguard BVLOS Sandbox rather than a discrete appraisal exercise. Through that process, continuation of existing arrangements, reliance on procedural mitigations alone, and permanent airspace change were all considered and discounted.

The establishment of a temporary TRA supported by a TMZ was identified as the most appropriate and proportionate solution and is therefore presented as the preferred option in this Stage 4 Airspace Change Proposal.

Section 10 Implementation and Monitoring

10.1 Overview

This section sets out the arrangements for the implementation, operation, monitoring, and review of the proposed Temporary Reserved Area (TRA) and associated Transponder Mandatory Zone (TMZ), should the airspace change be approved. The arrangements are designed to ensure that the airspace change is implemented safely, remains under effective operational control, and supports both regulatory oversight and learning throughout Phase 4 ("Accommodation") of the Vanguard BVLOS Sandbox.

The implementation and monitoring arrangements described in this section are consistent with, and supported by, the approved Concept of Operations (ConOps), the Specific Operations Risk Assessment (SORA), and the formal coordination arrangements documented through Letters of Agreement with Norwich Air Traffic Control and other stakeholders.

10.2 Implementation Arrangements

Implementation of the proposed airspace change will be undertaken in a controlled and coordinated manner prior to the commencement of BVLOS operations under the TRA/TMZ. Activation of the airspace will only occur once all prerequisites defined in the ConOps have been satisfied.

Prior to activation, StirlingX will coordinate with Norwich Air Traffic Control (ATC) to confirm the intended period of activation, operating parameters, and any local operational considerations. Activation of the TRA/TMZ will be notified through the publication of a NOTAM, specifying the lateral and vertical limits, activation times, and applicable operating conditions, in accordance with established procedures.

BVLOS operations will only be conducted when the TRA/TMZ is active and all operational, technical, and organisational requirements set out in the ConOps and SORA have been met. These arrangements ensure that the airspace change is implemented in a predictable and transparent manner and that other airspace users are provided with appropriate notice.

10.3 Operational Control and Governance

Operational control of BVLOS activity within the activated TRA/TMZ will be exercised by StirlingX in accordance with the ConOps. Governance arrangements ensure that responsibility and authority are clearly defined and understood by all parties involved.

Coordination with Norwich ATC forms a central component of the governance framework. Activation, operation, and deactivation of the TRA/TMZ will be managed in accordance with agreed procedures. These arrangements are formalised through a Letter of Agreement and reflected in the operational procedures described in the ConOps.

Priority access for emergency services and state aircraft is preserved at all times. Procedures for suspension of RPAS operations in response to emergency or military requirements are documented and have been agreed with relevant stakeholders.

Operations will follow phased Trial Plan, described in Appendix F. This three (3) phased Flight Trial Plan ensures a structured and progressive approach to flight and operational trialling within the Sandbox, with increasing complexity and distances in each consecutive phase. Phase 1 and 2 will be completed in the Centre Sector, Phase 3 in the central, Western Sector and Eastern Sectors. Each phase is broken down to three parts. 1. Flight Operations Procedures, 2. Technology, and 3. Airspace Management Procedures. StirlingX will utilise a *Test, Validate, Refine* approach to the flight trialling and all three parts will be assessed during each of the three phases. Areas to be trialled and desired outcomes for each part are listed in the Trail Plan document.

10.4 Monitoring of Operations

Monitoring arrangements are in place to assess the effectiveness of the airspace change and to support ongoing safety assurance. StirlingX will maintain operational records for all BVLOS flights conducted within the TRA/TMZ, including details of activation periods, flight profiles, and coordination with Air Traffic Services.

Operational monitoring will include review of interactions with other airspace users, coordination with Norwich ATC, and any deviations from planned procedures. This information will be used to assess whether the airspace construct and associated mitigations are functioning as intended.

Monitoring data will be retained and made available to the Civil Aviation Authority as required to support oversight and evaluation of the sandbox activity.

10.5 Safety Monitoring and Occurrence Reporting

Safety monitoring will be conducted in accordance with the Change Sponsor's safety management arrangements and the approved SORA. This includes the reporting, investigation, and review of safety occurrences, hazards, and abnormal events relevant to BVLOS operations and the operation of the TRA/TMZ.

The effectiveness of mitigations identified in the SORA, including those associated with the airspace change, will be reviewed on an ongoing basis. Where necessary, corrective actions will be implemented, and procedures updated to address any emerging safety concerns.

Any safety issues that have implications for the airspace change itself will be reviewed in coordination with Norwich ATC and, where appropriate, notified to the Civil Aviation Authority.

10.6 Review and Continuous Improvement

The temporary and trial-based nature of the Vanguard BVLOS Sandbox enables continuous review and refinement of operating arrangements. Feedback will be sought from operational personnel, Air Traffic Services, and other stakeholders as appropriate during the course of the trial.

Findings from operational and safety monitoring will be used to inform procedural improvements and to support regulatory learning. This feedback loop is consistent with the objectives of the sandbox and the intent of the Airspace Change Process.

10.7 Suspension, Modification, or Withdrawal

The proposed airspace change is temporary and may be suspended, modified, or withdrawn at any time if required. Circumstances that may trigger suspension or withdrawal include identification of unanticipated safety issues, changes in operational requirements, or direction from the Civil Aviation Authority.

Procedures for suspension, modification, or withdrawal of the TRA/TMZ are defined in the ConOps and coordination arrangements with Norwich ATC. These procedures ensure that the airspace can be returned to its existing use safely and without delay.

10.8 Summary

The implementation and monitoring arrangements described in this section ensure that the proposed airspace change can be introduced, operated, reviewed, and withdrawn in a controlled and safe manner. The arrangements support effective oversight, maintain flexibility, and are consistent with the temporary and experimental nature of the Vanguard BVLOS Sandbox.

Section 11 Summary and Next Steps

11.1 Summary of the Proposal

This Stage 4 Airspace Change Proposal presents the finalised case for the establishment of a Temporary Reserved Area (TRA) supported by an associated Transponder Mandatory Zone (TMZ) to enable Phase 4 ("Accommodation") of the Vanguard Beyond Visual Line of Sight (BVLOS) Sandbox.

The proposal introduces a temporary, tactically activated airspace construct, activated by NOTAM and coordinated with Norwich Air Traffic Control, to support BVLOS operations without reliance on visual observer mitigation. The proposal does not introduce permanent changes to airspace classification, instrument flight procedures, or long-term access arrangements.

The airspace design, safety assessment, and operational arrangements have been developed in accordance with CAP1616 and are supported by a comprehensive Specific Operations Risk Assessment (SORA) and Concept of Operations (ConOps).

11.2 Consultation and Assurance

Consultation and stakeholder engagement have been completed in accordance with CAP1616 requirements and in a manner proportionate to the temporary and trial-based nature of the proposal. Engagement has included Air Traffic Services, military stakeholders, emergency services, general aviation representative bodies, and specialist aviation users.

Engagement has also included structured regional working group participation and iterative operational dialogue since 2021, demonstrating early and sustained stakeholder involvement prior to formal consultation.

Feedback received during consultation has been reviewed and addressed, resulting in clarification of procedures and formalisation of coordination arrangements through Letters of Agreement. No unresolved objections remain, and no further consultation is considered necessary prior to Stage 5 assessment.

A full record of engagement activity and outcomes is provided in the Stakeholder Engagement Report submitted as an appendix to this proposal.

11.3 Safety and Operational Readiness

The safety assessment demonstrates that risks arising from the proposed airspace change and associated BVLOS operations have been systematically identified and mitigated to an acceptable level. The proposed TRA/TMZ forms a key strategic mitigation within the SORA, reducing air risk and supporting safe coexistence with other airspace users.

Implementation, monitoring, and review arrangements ensure that the airspace change can be introduced, operated, and withdrawn in a controlled manner, with ongoing oversight and the ability to respond to emerging issues.

11.4 Next Steps

On approval of this Stage 4 submission, the Change Sponsor seeks progression to Stage 5 (Decision) of the Airspace Change Process.

Subject to CAA approval, the proposed airspace change will be implemented in accordance with the arrangements described in this ACP, with ongoing monitoring and reporting to support regulatory oversight and learning as part of the Vanguard BVLOS Sandbox.

Appendix A Concept of Operations

Contents

1) Vanguard BVLOS Sandbox Concept of Operations (unpublished but sent directly to the CAA).

Appendix B Safety Assessment

Content

1) Summary of Vanguard BVLOS Sandbox Specific Operations Risk Assessment (SORA), including hazard identification, risk classification, and mitigation detail (unpublished, but sent directly to the CAA).

Appendix C Stakeholder Engagement

Contents

Appendix D Letters of Agreement and Coordination Documents

Contents

Unpublished for GDPR control but sent directly to the CAA.

1) LoA with Norwich ATC
2) LoA with NPAS
3) LoA with East Anglia Air Ambulance
4) LoA with RAF Marham
5) LoA with NPCC
6) Letters of Support

Appendix E Airspace Design Supporting Material

Contents

1) Detailed airspace design drawings and coordinates
2) Activation and deactivation procedures
3) NOTAM procedures

Appendix F Additional Supporting Material

Contents

1) Statement of Need
2) Trial Plan (unpublished but sent directly to the CAA)
3) Additional relevant documents

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