STIRLINGX

Appendix C 3

Consultation Pack

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

Contents

StirlingX BVLOS Sandbox Consultation Pack

Executive Summary

This consultation pack outlines StirlingX's proposed BVLOS (Beyond Visual Line of Sight) drone operations within the Vanguard BVLOS Sandbox trial. The trial aims to demonstrate safe integration of unmanned aircraft into unsegregated airspace using Temporary Reserved Areas (TRA) and Transponder Mandatory Zones (TMZ). Stakeholder feedback is sought to inform the Airspace Change Proposal (ACP) under CAP1616 guidance.

Overview of the Proposed Airspace Change

Introduction

The Norfolk Offshore Wind Zone (NOWZ) is a renewable energy project involving the installation of 276 wind turbines in the North Sea off the coast of Norfolk. The cables from the turbines reach the Norfolk Coast at Happisburgh and will pass through Norfolk to Necton where the power will be fed into the National Grid. The cable corridor across Norfolk is under construction. StirlingX has carried out monthly construction and environmental monitoring surveys throughout the project.

Link to further information on the NOWZ project: https://norfolkzone.rwe.com/about-norfolk

StirlingX (previously HexCam) is a professional drone services provider with over 14 years' experience. We provide drone-based aerial survey, mapping, asset inspection, construction monitoring, thermal and creative imaging services across a range of industries including major infrastructure construction projects associated with the connection of large offshore wind farms into the National Grid.

The StirlingX team has been flying drones commercially since 2012 and collectively the remote pilots have conducted over 11,000 flights in excess of 1,800 hours of flight time.

StirlingX proposes to operate BVLOS drone flights along a 60 km construction corridor in Norfolk, supporting the Vanguard and Boreas offshore wind farm project. Operations will be conducted within a TRA/TMZ structure activated by NOTAM and managed by Norwich ATC. The airspace will initially require certified transponder equipage, with potential expansion to include other EC devices.

Safety and Risk Mitigations

Safety is ensured through strategic and tactical mitigations:

- TRA/TMZ structure to manage airspace access
- Electronic Conspicuity (EC) and Detect-and-Avoid (DAA) systems
- Traffic Service from Norwich ATC
- Ground Risk Buffers and contingency volumes
- Pilot training and operational procedures

Flight path

The cable corridor is specifically designed to avoid built up areas, so the majority of the flight path is over open countryside and farmland. Large areas of the flight path are currently part of a managed construction project with restricted public access. All construction personnel are required to wear full PPE, including hard hats, on the site.

Electronic Conspicuity

The StirlingX Sparrowhawk drone is equipped with ADS-B out and a Mode S transponder, ensuring visibility for Norwich ATC and local aircraft equipped with ADS-B receivers.

Ground-based PilotAware ATOM stations along the route detect electronically conspicuous aircraft including those equipped with:

- ADS-B
- FLARM
- PilotAware
- FANET+
- MLAT Mode-S

The ATOM stations transmit this information to the Remote Pilot in real time.

Temporary Reserved Area (TRA) and Transponder Mandatory Zone (TMZ)

The proposed TRA is shown in Maps 5-7. It is divided into 3 sections (west, centre and east) that can be independently activated by NOTAM to minimise impact on other air users. The ceiling is set at 750 feet AMSL on the Norwich QNH, equating to approximately 550 feet above ground level along most of the corridor.

The initial TMZ will ensure that all compliant aircraft entering the route will be electronically conspicuous and therefore visible to both the remote pilot and Norwich ATC. It is proposed that aircraft without a transponder can pass over the TRA at a minimum altitude of 750 feet on the Norwich QNH.

Flight Information Service

The StirlingX flight operations team will receive a flight information service from Norwich ATC.

Sparrowhawk Telemetry

The Sparrowhawk constantly transmits flight telemetry to the Remote Pilot. This includes:

- Altitude
- Height above ground level
- GNSS position
- Horizontal and vertical speed
- Battery voltage
- Battery current

This telemetry can be verified against information received by the ATOM stations and Norwich ATC.

Training

All StirlingX remote pilots involved in the project have extensive experience operating on visually mitigated BVLOS operations on the NOWZ corridor and other UK infrastructure projects. The StirlingX Head of Flight Operations also holds an ATPL(H) and has experience flying AW139 helicopters in UK airspace.

Operational Details

Introduction

Stirling X has carried out regular drone surveys and video flythroughs of the NOWZ cable corridor since 2021. StirlingX currently employs a multirotor drone for survey purposes. Surveys generally take 2 full working days per month, using 16 take-off points along the corridor.

StirlingX proposes to fly a fixed-wing aircraft capable of vertical take-off and landing (VTOL) along the cable corridor to carry out monthly environmental and construction monitoring surveys. Key advantages over the current methodology include:

- Reduced number of take-off and landing points
    - Reduces noise disturbance on take-off and landing
    - Reduces need to park and access land

- Increased energy efficiency
- Reduced flight times (surveys should eventually take less than 2 days per month)
- Reduced noise profile

Beyond Visual Line of Sight (BVLOS) flight profile

All BVLOS flights will be carried out between 200 feet and 400 feet above ground level, with surveys carried out at 400 feet.

Flights will be controlled by a Remote Pilot at Felthorpe Airfield who will be in constant communications with Norwich Air Traffic Control (ATC) and any StirlingX team members on the corridor.

All BVLOS flights will be carried out within the flight volume indicated by the green area on **Map 9**. Video flights will involve a straight line out and return flight along the centre line of the corridor. Survey flights will involve multiple flights along the corridor within the flight volume. Take-off and landing will take place initially at defined points in each section of the TRA and eventually from Felthorpe Airfield. Planned take-offs and landings will always be supervised by a designated take-off and landing site officer (TOLSO) who will be in radio contact with the Remote Pilot.

Maps and Diagrams

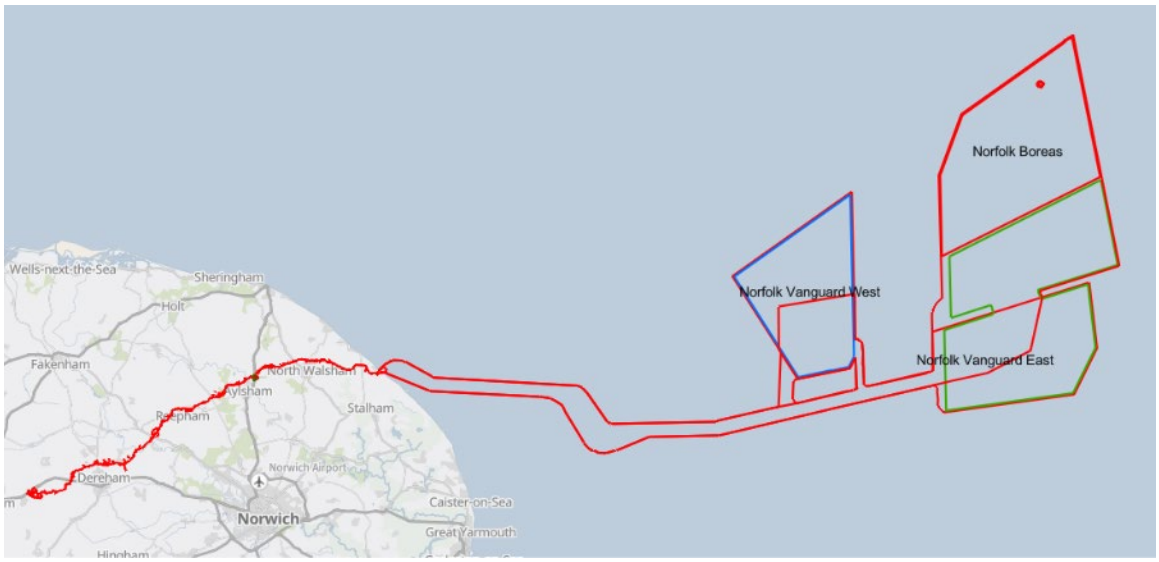
Interactive map of the NOWZ plan on the NOWZ website

https://norfolkzone.rwe.com/about-norfolk/interactive-map or use the QR code below.

Interactive map of the StirlingX proposed TRA/TMZ

Click here or use the QR code below.

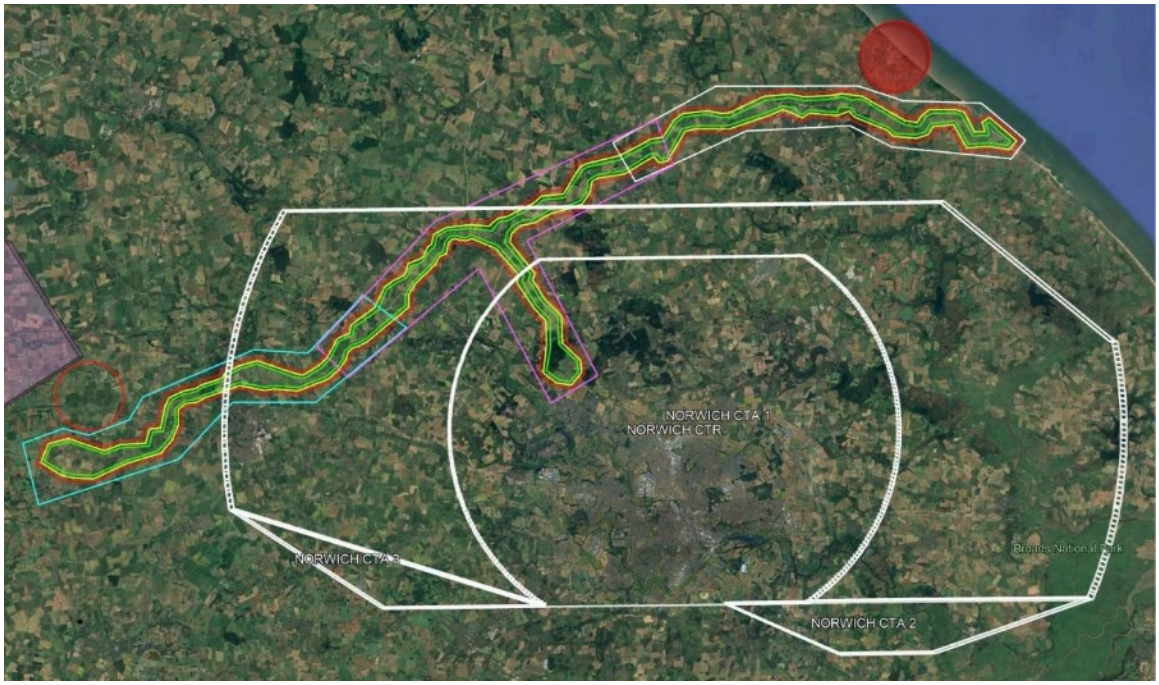
Map 1: Overview map of the Norfolk Offshore Wind Zone (source: NOWZ website)



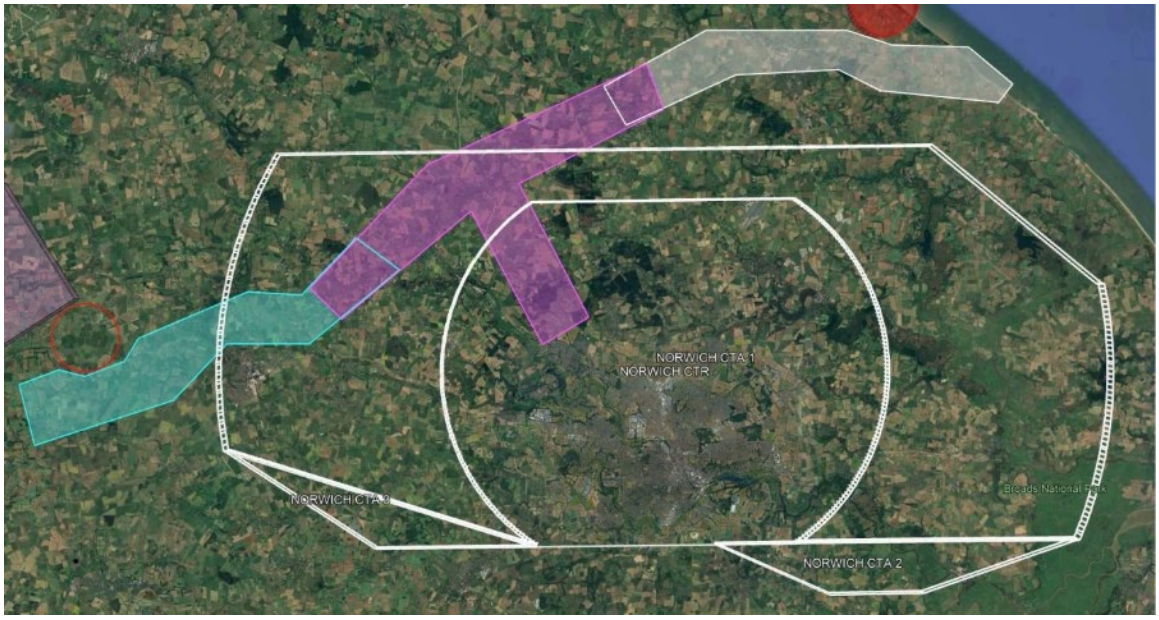
Map 2: The NOWZ cable corridor (source: NOWZ website)

Map 3: Norwich Airport controlled airspace (source: Norwich Airport)

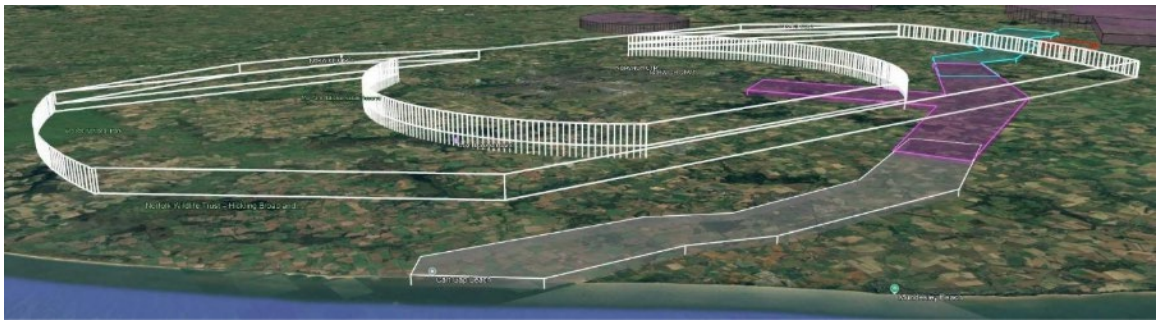
Map 4: NOWZ cable corridor flight areas in the context of Norwich controlled airspace



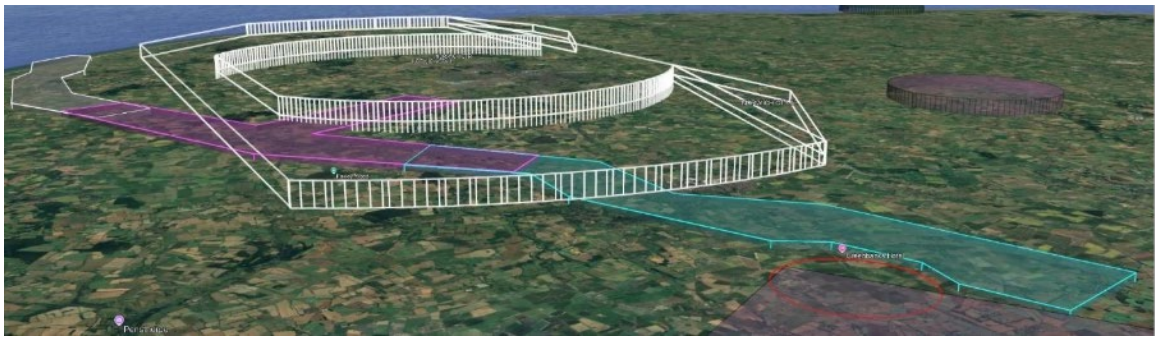
Map 5: Proposed TRA in the context of Norwich controlled airspace (2D)



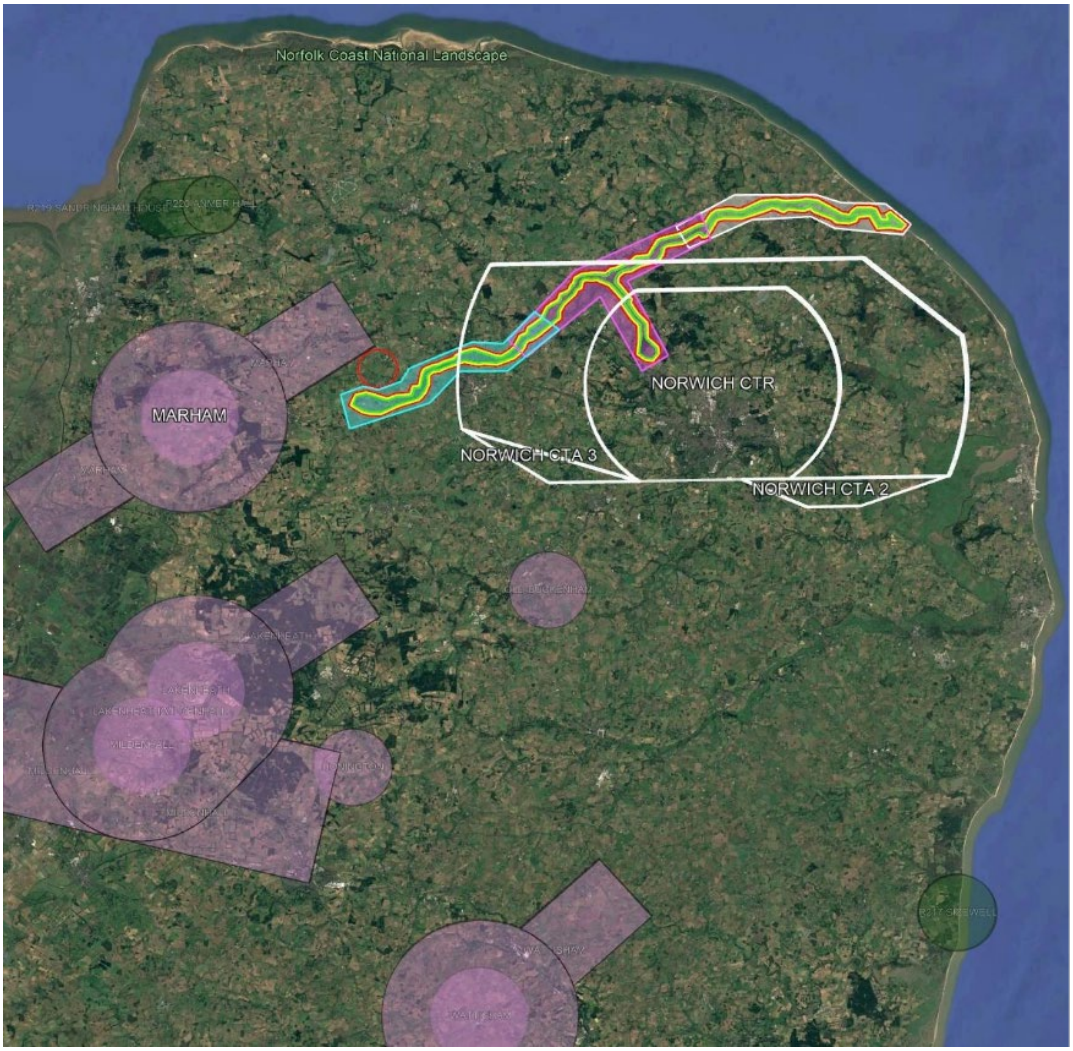
Map 6: Proposed TRA (ceiling 750 feet AMSL) in the context of Norwich controlled airspace (CTR: Surface to 4,000 feet, CTA: 1,500 feet to 4,000 feet AMSL) (3D from north-east)



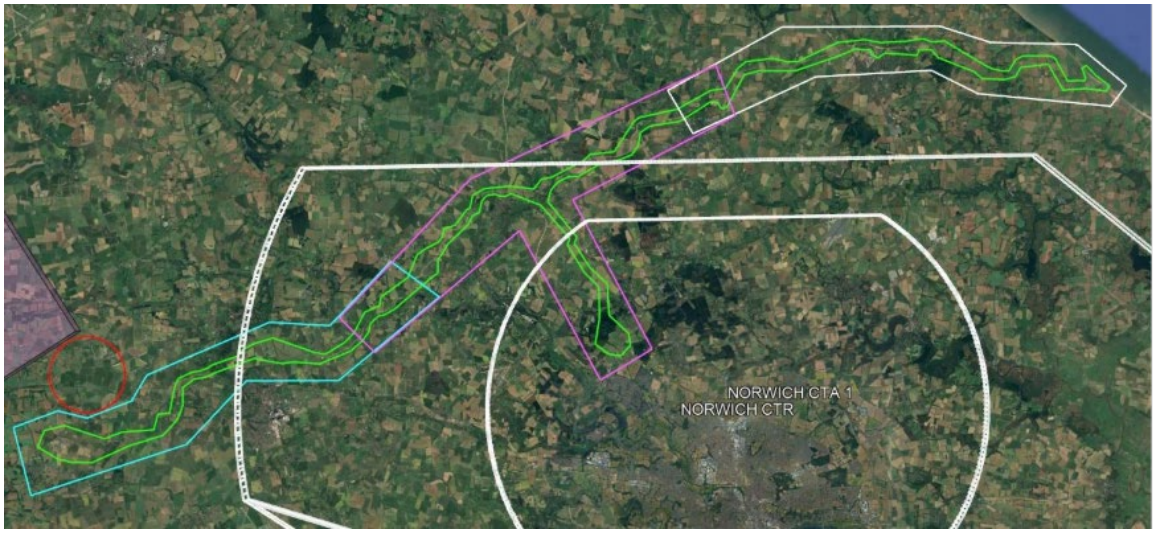
Map 7: Proposed TRA (ceiling 750 feet AMSL) in the context of Norwich controlled airspace (CTR: Surface to 4,000 feet, CTA: 1,500 feet to 4,000 feet AMSL) (3D from north-west)



Map 8: Major civilian and military airfields in Norfolk and Suffolk



Map 9: BVLOS flight volume (green)



Technical Summary

Electronic Conspicuity (EC)

The StirlingX Sparrowhawk drone is equipped with ADS-B out and a Mode S transponder, ensuring electronic conspicuity for Norwich ATC and local aircraft equipped with ADS-B.

Airspace surveillance

Ground-based PilotAware ATOM stations along the route detect electronically conspicuous aircraft including those equipped with:

- ADS-B
- FLARM
- PilotAware
- FANET+
- MLAT Mode-S

The ATOM stations transmit this information to the remote pilot in real time.

This will provide additional visual information alongside the information supplied by radio by Norwich ATC.

Detect and Avoid (DAA)

The primary method of deconfliction is the flight information service supplied by Norwich ATC.

The proposed TRA ensures that aircraft without electronic conspicuity should not enter the TRA/TMZ.

Sparrowhawk is equipped with a first-person view camera that may assist the remote pilot to avoid non-compliant aircraft but is primarily present to allow the remote pilot to monitor current progress and to identify safe landing areas in the event of an emergency.

Timeline and Consultation Activities

The consultation will run from 13th September 2025 to 15th November 2025.

Key activities include:

- Public drop-in sessions in affected villages
- Online webinars for aviation stakeholders
- Printed materials distributed via local councils
- Feedback collection via online portal and postal forms

How to Respond

Stakeholders can respond via:

- StirlingX online portal: https://www.stirlingx.io/bvlos-sandbox-trial/
- CAA Online portal: https://airspacechange.caa.co.uk/PublicProposalArea?pID=727
- Email: engagement@stirlingx.io
- Postal address: StirlingX, Felthorpe Airfield, Taverham Rd, Norwich, England, NR10 4DR

Please submit responses by **Friday 14th November 2025**.

Frequently Asked Questions (FAQs)

General FAQs

Who are StirlingX?

StirlingX (formerly known as HexCam) is a professional drone services provider with over 14 years of experience operating drones across the UK. The company specialises in aerial survey, mapping, asset inspection, construction monitoring, thermal imaging, and creative imaging services. Our work spans multiple industries, including major

infrastructure projects—particularly those involving the connection of offshore wind farms to the National Grid.

1. What is the BVLOS Sandbox and why is it being trialled?

The BVLOS Sandbox is a Civil Aviation Authority initiative designed to test the safe integration of unmanned aircraft systems (UAS) operating (BVLOS) in unsegregated UK airspace. The StirlingX phase 4 trials use Temporary Reserved Areas (TRA) and Transponder Mandatory Zones (TMZ) to validate technologies and procedures that could support future routine BVLOS operations.

2. Where will the BVLOS flights take place?

Flights will occur along a 60 km cable corridor in Norfolk, supporting the Norfolk Offshore wind Zone Vanguard and Boreas offshore wind farm construction. The route is almost fully within Class G airspace with TRA/TMZ overlays and also includes a link corridor to Felthorpe Airfield which is partially within the Norwich CTR class D airspace.

3. What is the BVLOS flight profile?

Flights will occur between 200–400 feet AGL, with surveys conducted at 400 feet. Operations are confined to a defined flight volume as shown on our maps.

4. What safety measures are in place to protect other airspace users?

Safety is ensured through the use of EC devices such as ADS-B and Mode S transponders as well as PilotAware. A flight information service from Norwich ATC and activation of airspace via NOTAMs provides further protection. We have additional strategic and tactical mitigations including geofencing, strobe lighting, and real-time telemetry monitoring.

5. How is airspace deconfliction managed?

A Temporary Reserved Area (TRA) and Transponder Mandatory Zone (TMZ) are proposed. The TRA is divided into three sections (west, centre and east) and can be activated independently via NOTAM. Aircraft without transponders must remain above 750 feet AMSL on Norwich QNH whilst over the cable corridor.

6. How is ground risk managed during BVLOS operations?

Ground risk is mitigated by operating in controlled construction zones with restricted public access, avoiding densely populated areas, using onboard FPV cameras and telemetry for real-time ground observation, and applying UK SORA criteria to reduce Ground Risk Class (GRC) to acceptable levels.

7. What role does Norwich ATC play in the trial?

Flights are remotely piloted from Felthorpe Airfield with continuous communication with Norwich ATC. Norwich ATC acts as the Air Navigation Service Provider (ANSP), managing the TRA/TMZ and providing a flight information service to StirlingX Remote Pilots. They support situational awareness and deconfliction, and have been involved in planning and coordination meetings.

8. Will other aircraft be allowed to enter the trial airspace?

Initially, only aircraft with certified transponders or recognised EC devices can enter the TRA/TMZ. As the trial progresses, access may expand to include other EC-equipped aircraft, simulating a more integrated airspace environment.

9. How are local aviation stakeholders being engaged

StirlingX has conducted outreach with local flying clubs (e.g. Felthorpe Airfield and Norfolk Hang Gliding and Paragliding Club), East Anglia Air Ambulance, military operators (e.g., Wattisham Apache squadrons), and commercial operators at Norwich Airport, as well as giving regular presentations at the East Anglia Airspace Users Working Group (EEAUWG). This ensures mutual notification of flight activity and supports strategic deconfliction.

10. What happens in case of an emergency during BVLOS flights?

Defined emergency procedures include: GNSS loss (transition to multirotor mode and emergency landing), telemetry or C2 loss (loiter or return to emergency landing area), and aircraft incursion (loiter and coordinate with ATC). All incidents are reported and reviewed post-flight.

11. What type of drone is being used in the trial?

The Sparrowhawk FX10NG, a fixed-wing VTOL UAS, is used. It features ADS-B and Mode S transponders, redundant 4G/5G command and control, high-intensity strobe lighting, 2-hour endurance and 50-knot max speed and is designed for safe BVLOS operations in rural environments.

12. How will the trial influence future BVLOS regulations?

Phase 4 aims to validate the airspace policy concept and technologies for BVLOS integration. Insights from this phase will inform Phase 5, which introduces shared airspace between manned and unmanned aircraft, moving towards full integration under UK CAA policy.

FAQs for residents and landowners

1. Why are there drones above the NOWZ cable corridor?

StirlingX is conducting monthly aerial surveys using drones to monitor construction progress and environmental conditions along the Norfolk Offshore Wind Zone cable corridor between Happisburgh and Necton.

2. Will the drones fly over my property?

Flights are planned to avoid built-up areas and will mostly occur over open countryside or restricted construction zones. Take-off and landing points are carefully chosen to minimise land access. StirlingX are approved by the CAA for overflight of uninvolved people, but we avoid this wherever possible.

3. Are the drones noisy or disruptive?

The new aircraft is quieter than previous models that we have used along the corridor since 2021, especially after transition to fixed-wing mode. Surveys will be completed in fewer days each month, reducing overall disruption. We will use a reduced number of take-off points with the new drone, which minimises the requirement for access to private land.

4. How is safety ensured during flights?

All flights are monitored in real time by a trained pilot and coordinated with Norwich Air Traffic Control. The drone is equipped with technology to show its position to other aircraft and we constantly monitor the positions of other aircraft in the area.

5. Will drones affect my privacy?

Flights are focused on monitoring construction and environmental conditions within the cable corridor. The maps created are cropped so they only show the corridor and a small area around.

6. Who can I contact with concerns or questions?

StirlingX has provided these consultation materials and is available to answer questions and to receive comments via our consultation page and the contact details below. You can also view interactive maps and more details of the NOWZ project at https://norfolkzone.rwe.com/about-norfolk.

Contact Information

For further information, please contact:

- Name: **Redacted**
- Email: engagement@stirlingx.io
- Phone: **Redacted**