Gas Networks Ireland

SurveyLabs
I·R·E·L·A·N·D

UAV System Survey and Post-Processing

Report created by:
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Changelog

v1.0	Sep 2024	Initial release of the report.

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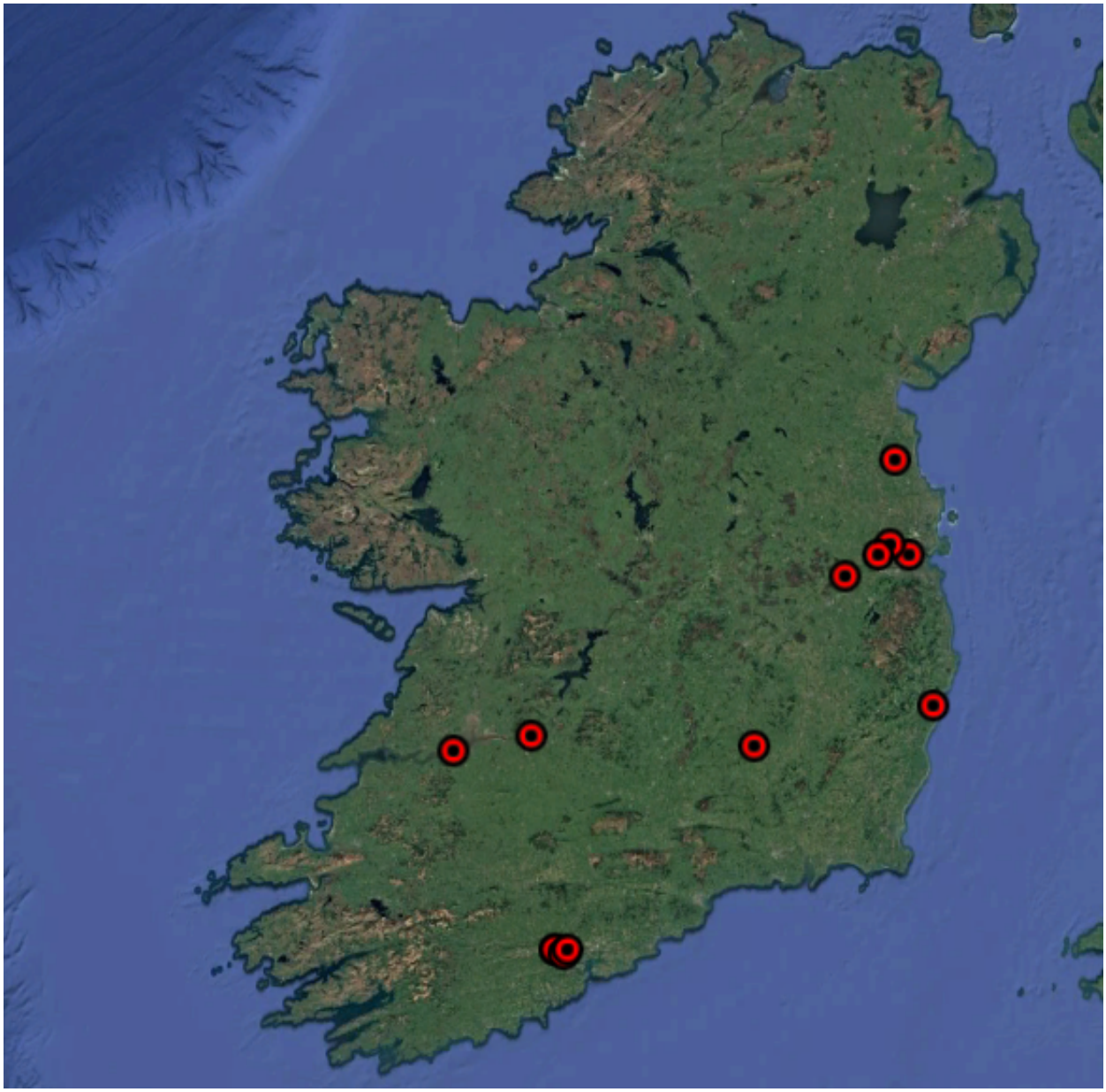
1 Introduction

This document provides a comprehensive overview of the pricing structure for 14 drone survey sites by **SurveyLabs Ireland** for **Gas Networks Ireland - GNI**, detailing the various factors that influence the cost of each project. It outlines the specific areas to be surveyed, the corresponding tasks required for each location, and the associated equipment and services necessary to complete the job efficiently. The pricing breakdown takes into account the complexity of the terrain, the type of data to be collected, and the specialized tools needed, including high-resolution cameras, gas sensors, and post-processing software. Additionally, this document addresses the logistical considerations and expertise required to ensure accurate and reliable survey results across different project areas.



2 Pricing per survey site

Table 1: Drone Survey Areas and Pricing

Description of Job	Services Included	Price (€)
Desk Study	16 Person days Consultancy, Report Completion and Workshop	€ 12,000
Survey Area 1	Drone Flights, Travel and Subsistence, Data Processing and Data Handover	€ 3,400
Survey Area 2	Drone Flights, Travel and Subsistence, Data Processing and Data Handover	€ 3,400
Survey Area 3	Drone Flights, Travel and Subsistence, Data Processing and Data Handover	€ 3,400
Survey Area 4	Drone Flights, Travel and Subsistence, Data Processing and Data Handover	€ 3,400
Survey Area 5	Drone Flights, Travel and Subsistence, Data Processing and Data Handover	€ 3,400
Survey Area 6	Drone Flights, Travel and Subsistence, Data Processing and Data Handover	€ 3,400
Survey Area 7	Drone Flights, Travel and Subsistence, Data Processing and Data Handover	€ 2,650
Survey Area 8	Drone Flights, Travel and Subsistence, Data Processing and Data Handover	€ 3,400
Survey Area 9	Drone Flights, Travel and Subsistence, Data Processing and Data Handover	€ 3,400
Survey Area 10	Drone Flights, Travel and Subsistence, Data Processing and Data Handover	€ 2,650
Survey Area 11	Drone Flights, Travel and Subsistence, Data Processing and Data Handover	€ 3,400
Survey Area 12	Drone Flights, Travel and Subsistence, Data Processing and Data Handover	€ 2,650
Survey Area 13	Drone Flights, Travel and Subsistence, Data Processing and Data Handover	€ 3,400
Survey Area 14	Drone Flights, Travel and Subsistence, Data Processing and Data Handover	€ 2,650

3 Equipment

- 2 x DJI M300 and M350 UAS
- Flight termination system & Parachute
- P1 full frame camera 45MP
- DJI M3E UAS
- RTK service
- Ground control points, precisely surveyed with RTK GPS
- Data transfer via cloud and/or hardcopy on HDD
- GSD requirement of 1cm or better
- Methane/Gas sensor with readings mapped to GNSS position

4 Study Overview

The study will focus on identifying and evaluating the best available technologies for GNI's infrastructure surveys, particularly those capable of detecting and quantifying methane leaks. This will support GNI's compliance with upcoming European directives, particularly in relation to methane measurement across onshore and offshore infrastructure.

The evaluation will include:

- **Technology Overview**
  - Current technologies available for detecting and quantifying methane leaks across different environments (onshore and offshore).
  - Industry analysis to understand technological adoption and gaps.
  - How well the proposed technology solves GNI's methane detection needs.
- **Regulatory & Compliance Landscape**
  - An analysis of European regulations on methane emissions detection, specifically onshore facilities (e.g., compressor stations, metering and valve stations) and offshore installations (e.g., subsea pipelines).
- **Technology Suppliers**
  - A comparative analysis of the top suppliers, evaluating their products, their advantages, and limitations, including cost assessments.
  - The technology's maturity level and readiness for large-scale deployment.
- **SWOT Analysis**
  - A review of Strengths, Weaknesses, Opportunities, and Threats of potential technologies.
- **Market Pricing**
  - Cost comparisons of the various technologies and solutions, factoring in capital costs, deployment costs, and maintenance.

Charge for Services

A charge of €750 per day will be levied for this work, and the project will take 16 person days to complete. However, this is open to adjustment where necessary. **Total Charge: €12,000.**

5 Survey sites

5.1 Brian Boru Bridge (Survey Area 1)

General geography:

- Three lane bridge with pedestrian sidewalk from both sides of the bridge, and metal structure in the middle approx. 6m high. Location: Cork city centre.
- Length: 75m
- Width: 18m
- Very low bridge – distance to the water 2m or less – not possible to fly under. Not sure if you can even pass a blueboat under it when water is high.
- Very busy bridge – Cork City Centre, a lot of cars and pedestrians.
- Top side of the bridge is a restricted zone due to Cork Airport – max height allowed 30m, or 15m above obstacles. Close to prohibited zone (Cork Prison), but this shouldn't be an issue.
- **Photogrammetry:** Mavic 3E + RTK with parachute.

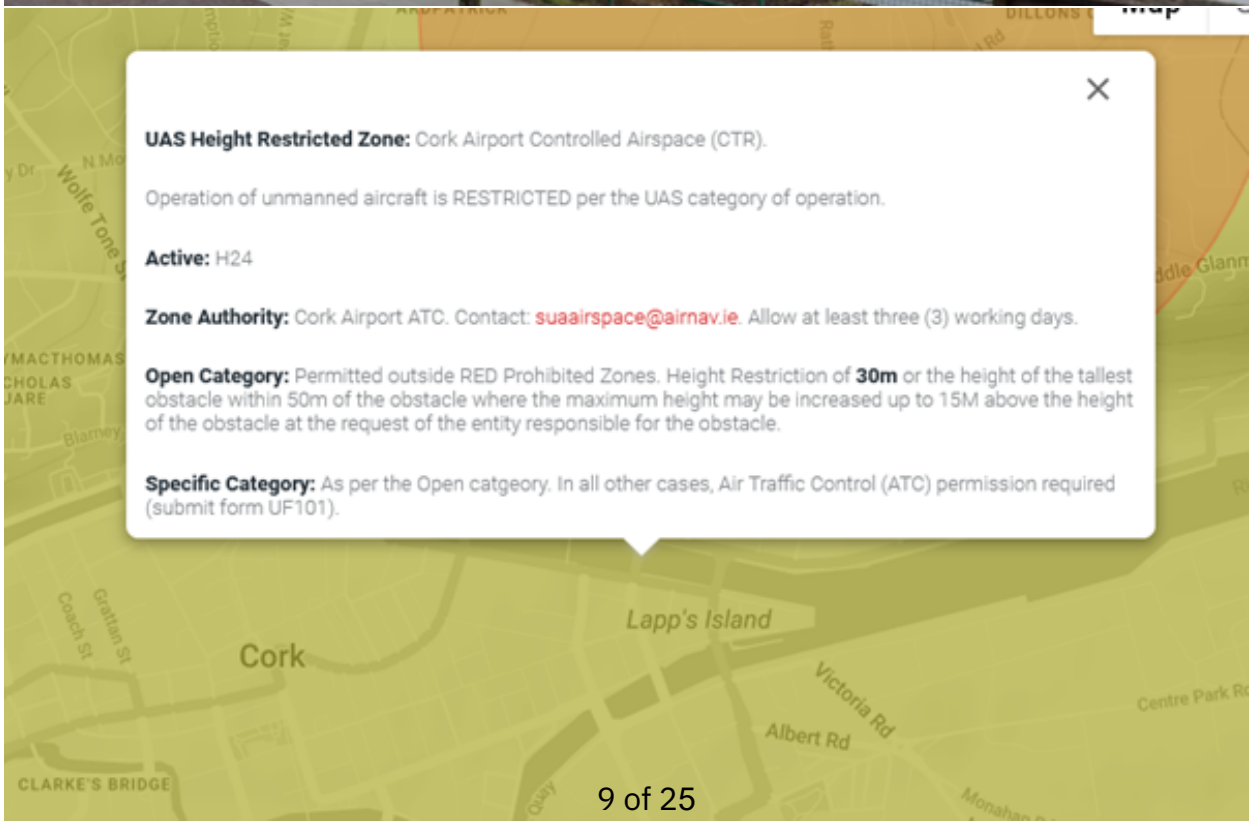
Gas:

- M350 with Gas sensor / Sniffer (Sorability system).

Survey cost/timeline:

- 1.5 full days in the field with 2 people, 1 day in the office processing photos/gas (1 person).
- Total: 4 person days + travel and subsistence, data handover.
- Night time survey requirement for Gas sensor.


River Lee
Anderson's Quay


UAS Height Restricted Zone: Cork Airport Controlled Airspace (CTR).
Operation of unmanned aircraft is RESTRICTED per the UAS category of operation.
Active: H24
Zone Authority: Cork Airport ATC. Contact: suaairspace@airnav.ie. Allow at least three (3) working days.
Open Category: Permitted outside RED Prohibited Zones. Height Restriction of 30m or the height of the tallest obstacle within 50m of the obstacle where the maximum height may be increased up to 15M above the height of the obstacle at the request of the entity responsible for the obstacle.
Specific Category: As per the Open catgeory. In all other cases, Air Traffic Control (ATC) permission required (submit form UF101).
Lapp's Island
Cork
Albert Rd
Victoria Rd
CLARKE'S BRIDGE

5.2 Clontarf Bridge – identical to Brian Boru Bridge (Survey Area 2)

General geography:

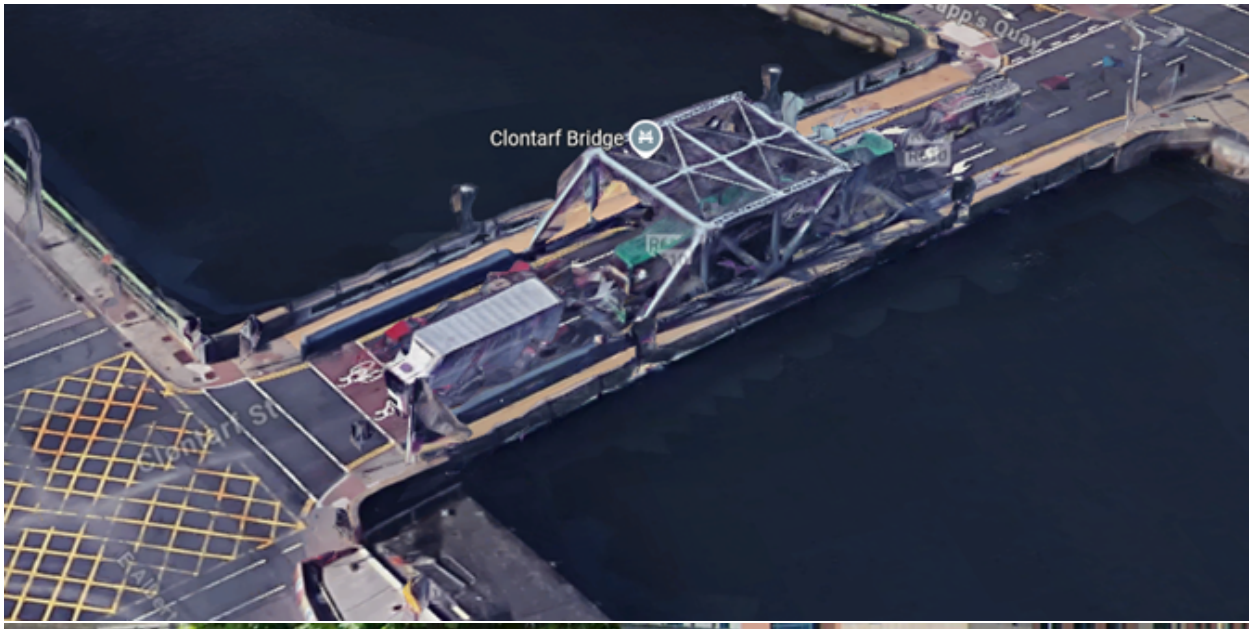
- Three lane bridge with pedestrian sidewalk from both sides of the bridge, and metal structure in the middle approx. 6m high. Location: Cork city centre.
- Length: 75m
- Width: 18m
- Very low bridge – distance to the water 2m or less – not possible to fly under. Not sure if you can even pass a blueboat under it when water is high.
- Very busy bridge – Cork City Centre, a lot of cars and pedestrians.
- Top side of the bridge is a restricted zone due to Cork Airport – max height allowed 30m, or 15m above obstacles. Close to prohibited zone (Cork Prison), but this shouldn't be an issue.
- **Photogrammetry:** Mavic 3E + RTK with parachute.

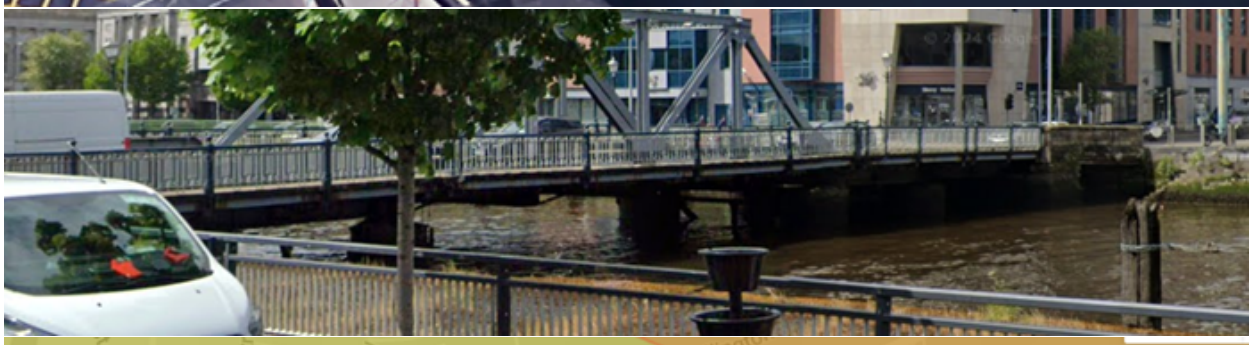
Gas:

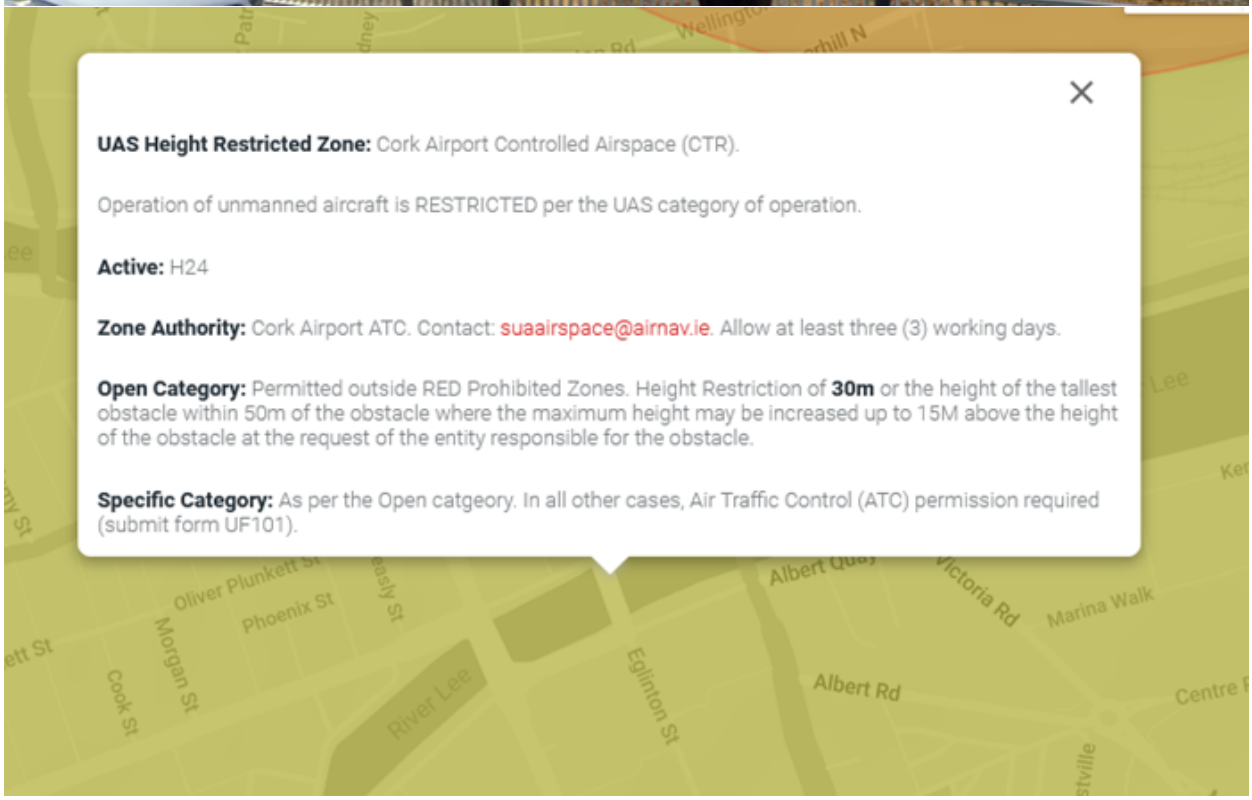
- M350 with Gas sensor / Sniffer (Sorability system).
- Night time survey requirement for Gas sensor.

Survey cost/timeline:

- 1.5 full days in the field with 2 people, 1 day in the office processing photos/gas (1 person).
- Total: 4 person days + travel and subsistence, data handover.


Clontarf Bridge




UAS Height Restricted Zone: Cork Airport Controlled Airspace (CTR).
Operation of unmanned aircraft is RESTRICTED per the UAS category of operation.
Active: H24
Zone Authority: Cork Airport ATC. Contact: suaairspace@airnav.ie. Allow at least three (3) working days.
Open Category: Permitted outside RED Prohibited Zones. Height Restriction of **30m** or the height of the tallest obstacle within 50m of the obstacle where the maximum height may be increased up to 15M above the height of the obstacle at the request of the entity responsible for the obstacle.
Specific Category: As per the Open catgeory. In all other cases, Air Traffic Control (ATC) permission required (submit form UF101).
Albert Quay
Victoria Rd
Marina Walk
Albert Rd
Oliver Plunkett St
Phoenix St
Morgan St
Cook St
River Lee
Eglinton St

5.3 Shannon Estuary Tx Crossing (1.875 km run) (Survey Area 3)

Geography:

- Crossing somewhere around Aughinish across the Shannon River/Estuary. Constant traffic of large ships but not really busy.
- UAS height restricted zone to 90m (open category) - Shannon Airport.

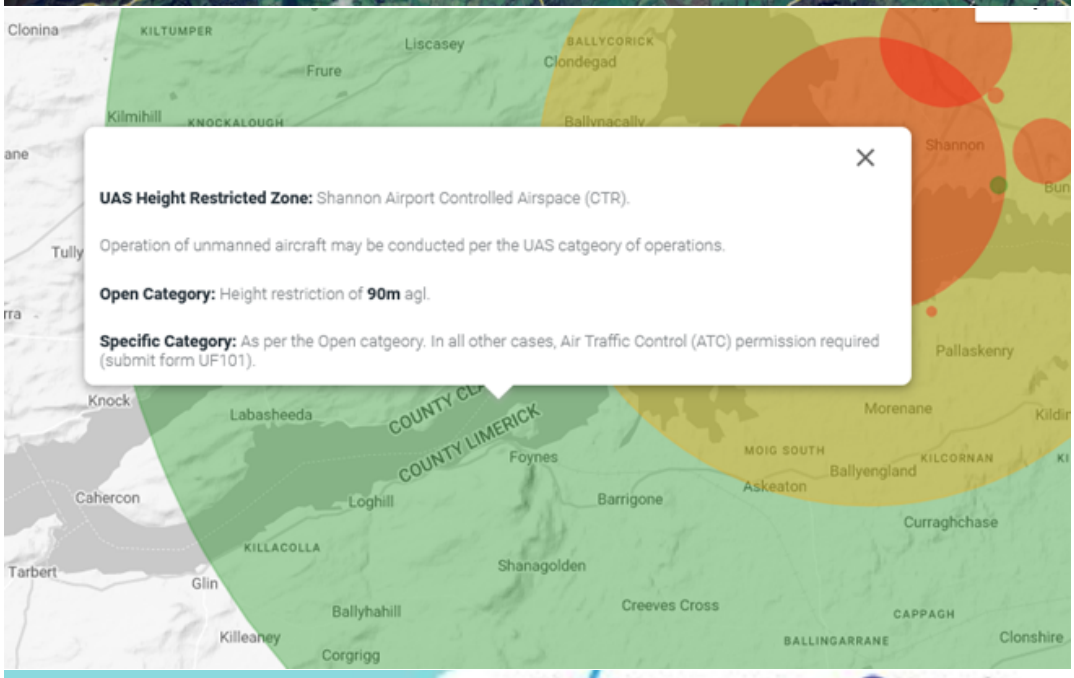
Gas:

- M350 with Gas sensor / Sniffer (Sorability system).

Survey cost/timeline:

- 1 day preparation (1 person) + 1 day survey (2 persons) + 1 day processing (1 person).
- Total: 4 person days + travel and subsistence, data handover.


R473
R473
N69
N69


Clonina
KILTUMPER
Liscasey
Frure
BALLYCORICK
Clondegad
Kilmihill
KNOCKALOUGH
Ballynacally
Shannon
Tully
UAS Height Restricted Zone: Shannon Airport Controlled Airspace (CTR).
Operation of unmanned aircraft may be conducted per the UAS catgeory of operations.
Open Category: Height restriction of 90m agl.
Specific Category: As per the Open catgeory. In all other cases, Air Traffic Control (ATC) permission required (submit form UF101).
Pallaskenry
Knock
Labasheeda
COUNTY LIMERICK
Foynes
Morenane
MOIG SOUTH
KILCORNAN
Ballyengland
Askeaton
Cahercon
Loghill
Barrigone
Curraghchase
KILLACOLLA
Tarbert
Glin
Shanagolden
Ballyhahill
Creeves Cross
CAPPAGH
Killeaney
Corgrigg
BALLINGARRANE
Clonshire


Ennis
Sixmilebridge
Nenagh
Ballina
Shannon
Limerick
Aughinish
Askeaton
Tipperary Town
Cahir
Listowel
Charleville
Mitchelstown
Mallow
Ardfinnan
Fermoy
Cork
Macroom
Whitegate
Ballineen
Kinsale
Inch

5.4 Little Island to Mahon Tx Crossing (750m) (Survey Area 4)

Geography:

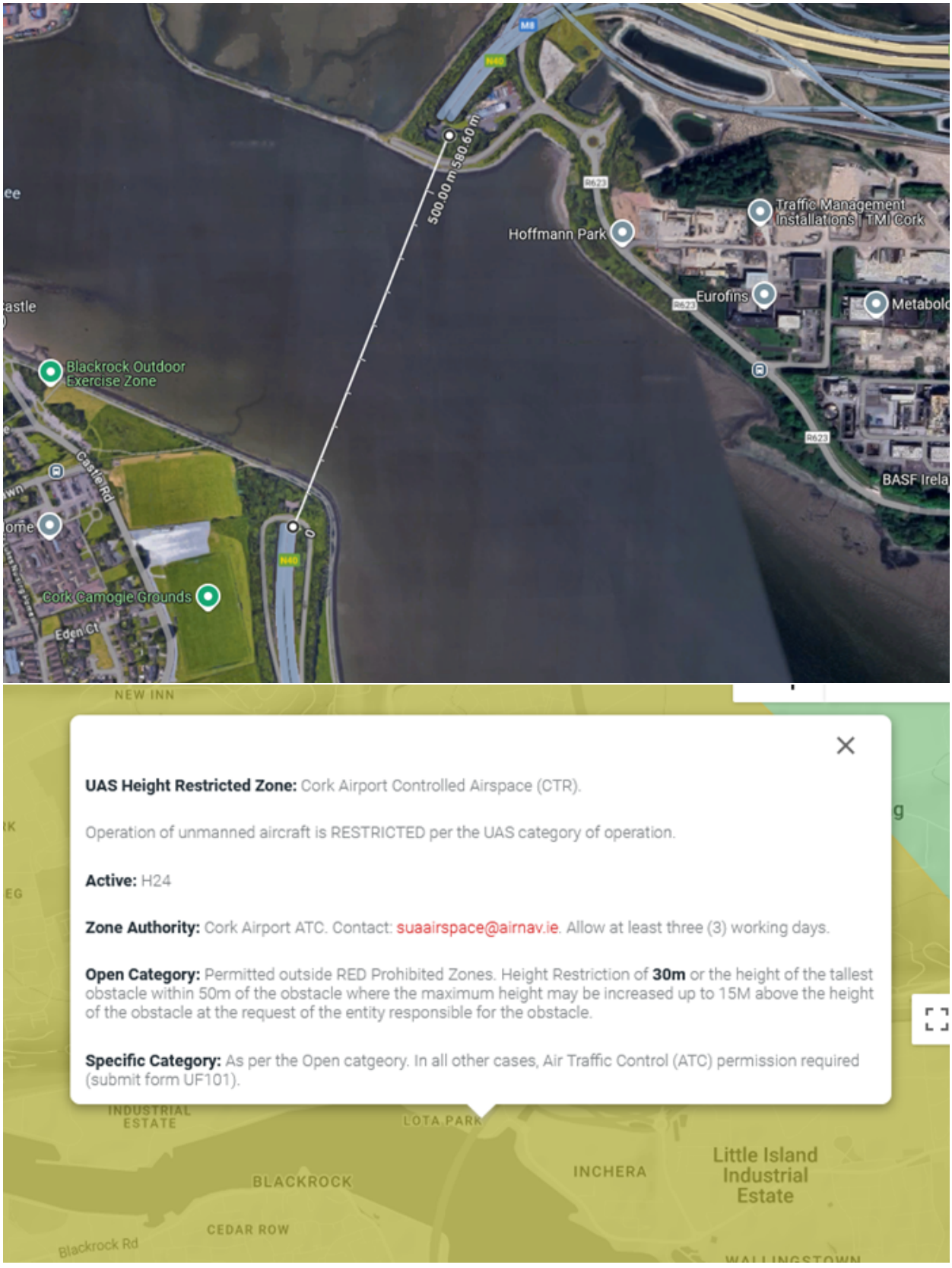
- Need exact location – assumption is it goes through N40 tunnel. Cork is a busy harbor but should be okay to operate there.
- In terms of aerial operations, height restricted zone to 30m, flying over water if needed but I think not necessary.

Gas:

- M350 with Gas sensor / Sniffer (Sorability system).
- Night time survey requirement for Gas sensor.

Survey cost/timeline:

- 1.5 full days in the field with 2 people, 1 day in the office processing (1 person).
- Total: 4 person days + travel and subsistence.


500.00 m
580.60 m
Hoffmann Park
Traffic Management Installations | TMI Cork
Eurofins
Blackrock Outdoor Exercise Zone
Castle Rd
Cork Camogie Grounds
Eden Ct
BASF Irela
NEW INN
UAS Height Restricted Zone: Cork Airport Controlled Airspace (CTR).
Operation of unmanned aircraft is RESTRICTED per the UAS category of operation.
Active: H24
Zone Authority: Cork Airport ATC. Contact: suaairspace@airnav.ie. Allow at least three (3) working days.
Open Category: Permitted outside RED Prohibited Zones. Height Restriction of 30m or the height of the tallest obstacle within 50m of the obstacle where the maximum height may be increased up to 15M above the height of the obstacle at the request of the entity responsible for the obstacle.
Specific Category: As per the Open catgeory. In all other cases, Air Traffic Control (ATC) permission required (submit form UF101).
INDUSTRIAL ESTATE
LOTA PARK
BLACKROCK
INCHERA
Little Island Industrial Estate
CEDAR ROW
Blackrock Rd

5.5 Mahon to Rochestown Tx Crossing (406m) (Survey Area 5)

Top side:

- Photogrammetry - Mavic 3E + RTK with parachute.

Gas:

- M350 with Gas sensor / Sniffer (Sorability system).
- Night time survey requirement for Gas sensor.

Survey cost/timeline:

- 1.5 full days in the field with 2 people, 1 day in the office processing (1 person).
- Total: 4 person days + travel and subsistence.

5.6 37 Lucan Sewage Treatment Works, Dublin (Survey Area 6)

Top side:

- Photogrammetry - Mavic 3E + RTK with parachute.

Gas:

- M350 with Gas sensor / Sniffer (Sorability system).
- **Flight zone prohibited due to Weston Airfield, UF101 requirement.**

Survey cost/timeline:

- 1 full day in the field with 2 people, 1 day in the office processing (1 person), 1 day for flight permissions and hardware requirements.
- Total: 4 person days + travel and subsistence. Data handover.

5.7 77381-RVX-MP-219-Mulhuddard Bridge, Dublin (Survey Area 7)

Top side:

- Photogrammetry - Mavic 3E + RTK with parachute.

Gas:

- M350 with Gas sensor / Sniffer (Sorability system).
- **Flight zone within Dublin ATZ – 3 day requirement for permissions.**

Survey cost/timeline:

- 1 full day in the field with 2 people, 1 day in the office processing (1 person).
- Total: 3 person days + travel and subsistence. Data handover.

5.8 42 Cabra Rd., Dublin (Survey Area 8)

Top side:

- Photogrammetry - Mavic 3E + RTK with parachute.

Gas:

- M350 with Gas sensor / Sniffer (Sorability system).
- **Flight zone prohibited due to Phoenix Park, UF101 requirement.**

Survey cost/timeline:

- 1 full day in the field with 2 people, 1 day in the office processing (1 person), 1 day for flight permissions and hardware requirements.
- Total: 4 person days + travel and subsistence. Data handover.

5.9 25 Bull Ring, Drogheda (Survey Area 9)

Top side:

- Photogrammetry - Mavic 3E + RTK with parachute.

Gas:

- M350 with Gas sensor / Sniffer (Sorability system).

Survey cost/timeline:

- 1.5 full days in the field with 2 people, 1 day in the office processing photo/gas (1 person).
- Total: 4 person days + travel and subsistence. Data handover.
- Night time survey requirement for Gas sensor.

5.10 Alexandra Bridge, Clane (Survey Area 10)

Top side:

- Photogrammetry - Mavic 3E + RTK with parachute.

Gas:

- M350 with Gas sensor / Sniffer (Sorability system).

Survey cost/timeline:

- 1 full day in the field with 2 people, 1 day in the office processing photo/gas (1 person).
- Total: 3 person days + travel and subsistence. Data handover.

5.11 3774810-RVX-MP-273, Arklow Bridge (Survey Area 11)

Top side:

- Photogrammetry - Mavic 3E + RTK with parachute.

Gas:

- M350 with Gas sensor / Sniffer (Sorability system).
- Night time survey requirement for Gas sensor.

Survey cost/timeline:

- 1.5 full days in the field with 2 people, 1 day in the office processing photo/gas (1 person).
- Total: 4 person days + travel and subsistence. Data handover.

5.12 Parteen Bridge, Clare (Survey Area 12)

Top side:

- Photogrammetry - Mavic 3E + RTK with parachute.

Gas:

- M350 with Gas sensor / Sniffer (Sorability system).

Survey cost/timeline:

- 1 full day in the field with 2 people, 1 day in the office processing photo/gas (1 person).
- Total: 3 person days + travel and subsistence. Data handover.

5.13 Green St, Bridge, Kilkenny (Survey Area 13)

Top side:

- Photogrammetry - Mavic 3E + RTK with parachute.

Gas:

- M350 with Gas sensor / Sniffer (Sorability system).
- Night time survey requirement for Gas sensor.

Survey cost/timeline:

- 1.5 full days in the field with 2 people, 1 day in the office processing photo/gas (1 person).
- Total: 4 person days + travel and subsistence. Data handover.

5.14 R463 Ardnacrusha, Co Clare (Survey Area 14)

Top side:

- Photogrammetry - Mavic 3E + RTK with parachute.

Gas:

- M350 with Gas sensor / Sniffer (Sorability system).

Survey cost/timeline:

- 1 full days in the field with 2 people, 1 day in the office processing photo/gas (1 person).
- Total: 3 person days + travel and subsistence. Data handover.