



2023

DRONECLOUD

Tools for scaling rail drone operations:  
A Network Rail Case Study

Intelligent Rail Summit 2023

# Jan Domaradzki

## Dronecloud CEO & co-founder

### About Jan & Dronecloud

Dronecloud develops software, services & processes to support the drone industry

Jan has a background in Technical Management Consultancy



# Drone Industry Roadmap



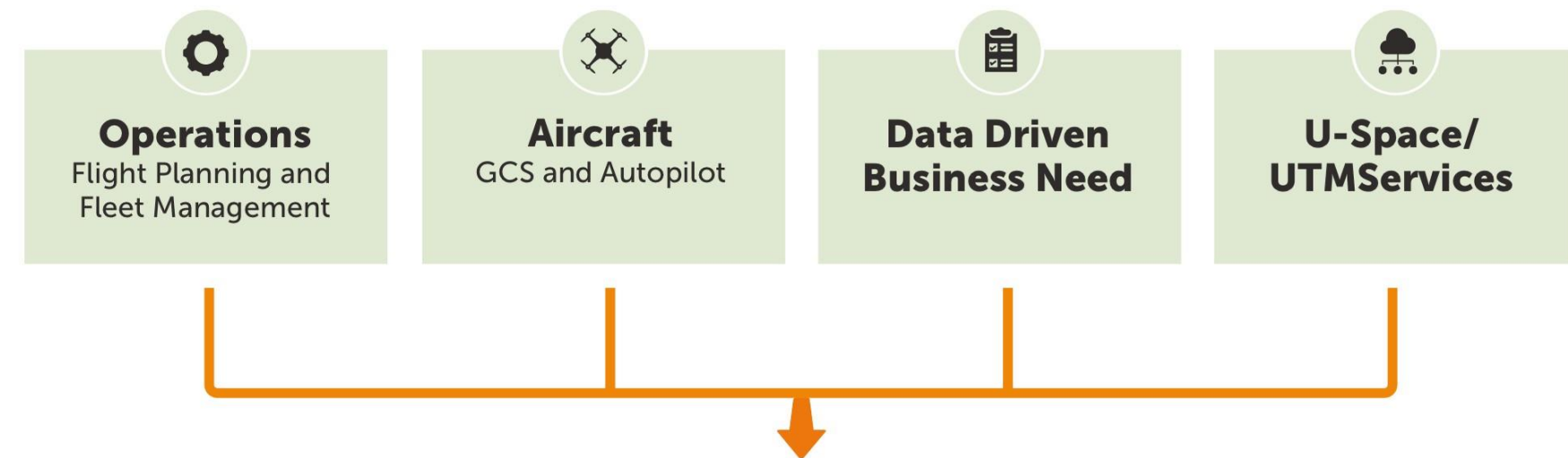
# Drone Operations TODAY

Multiple services & systems

Dronecloud bring these together to create a turn-key approach

We do this through creating software and partnerships

## Drones 1.0



## Drones 2.0

Enable Complex Drone Operations at Scale with Dronecloud™





## Network Rail – UK

National scope – managing 32k km track

One of 1<sup>st</sup> adopters – BAU not PoC

Growing operation – Centralised & Devolved

Did it properly – Governance & Sponsorship



# Operating Models

No playbook

Adopting drone services is a journey

No 'one size fits all'

Rail operators need to adopt and build the correct drone operating model that works for the present and future.

## ***Which model is right for you?***

1. INTERNAL – build and internal drone capability
2. MANAGED SERVICE – outsource drone operations
3. HYBRID – A combination of internal and managed service





# We create software and Turn-key operations

Dronecloud **FLY**

Dronecloud **CONTROL**

Dronecloud **Managed Service**



Tools for **operators** to manage every aspect of their drone operations to ensure compliance and safety.



Tools for **infrastructure owners & managers** giving operational oversight and control of one or more service providers



FLY & Control packaged with local Partners to deliver **'turn-key drone services'**

# Flight Management

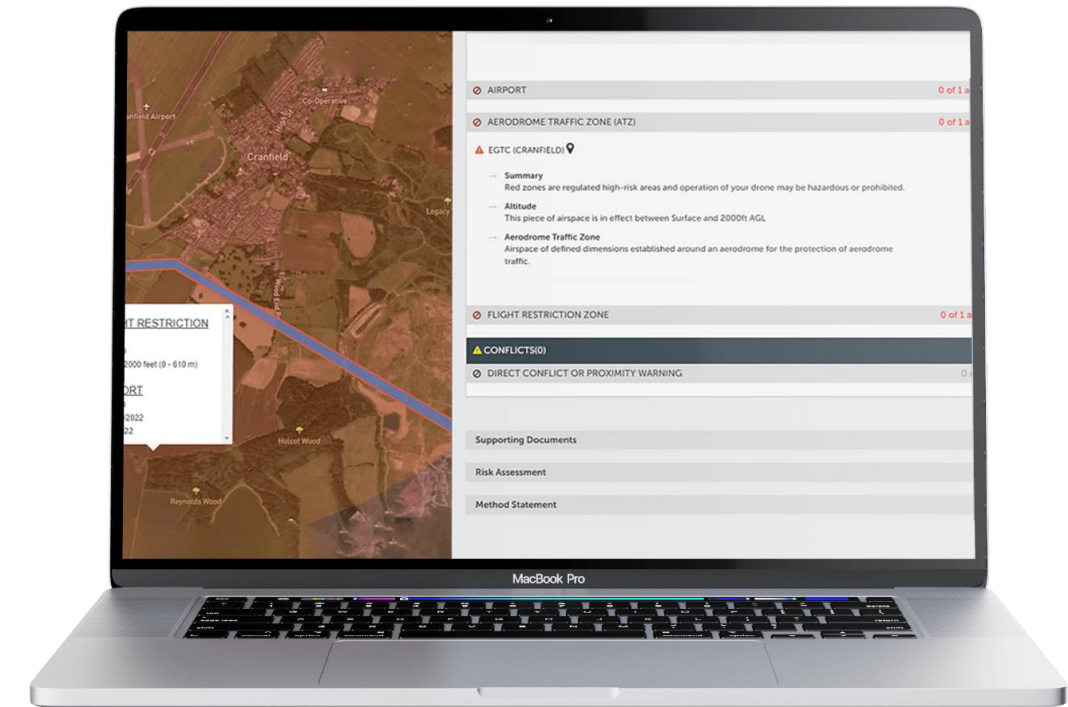
Cornerstone of all  
drone operations

Dronecloud FLY



Tools for operators to manage every aspect of their drone operations to ensure compliance and safety.

- Live airspace map
- Flight planning
- Risk assessment
- Checklists
- Flight logging
- Pilot Currency
- Aircraft Currency and maintenance
- Reporting Tools
- BVLOS operations
- UTM services
- Situational awareness





# Built for *enterprise*...

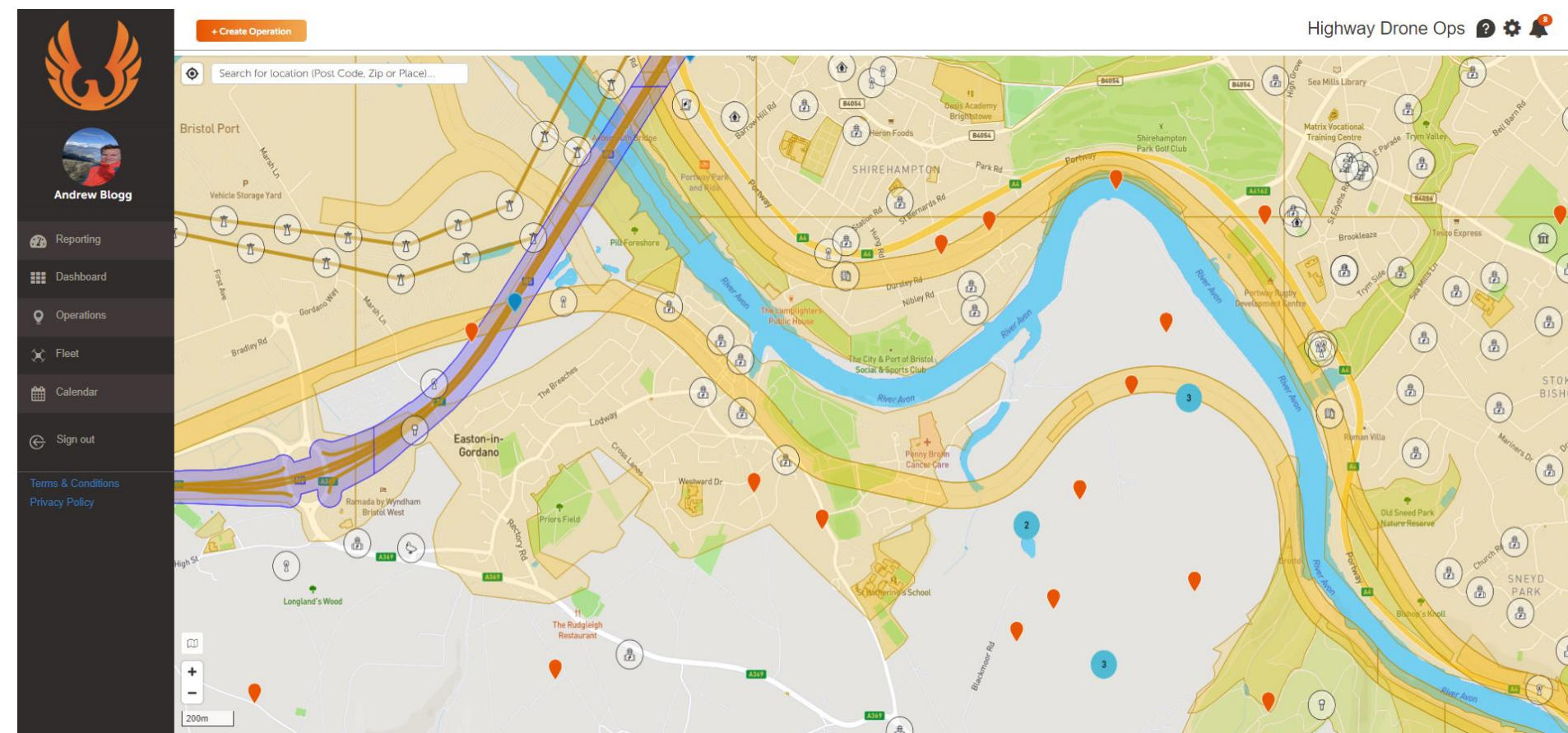
## Oversight & Governance

## Airspace management



Tools for **infrastructure owners & managers** giving operational oversight and control of one or more service providers

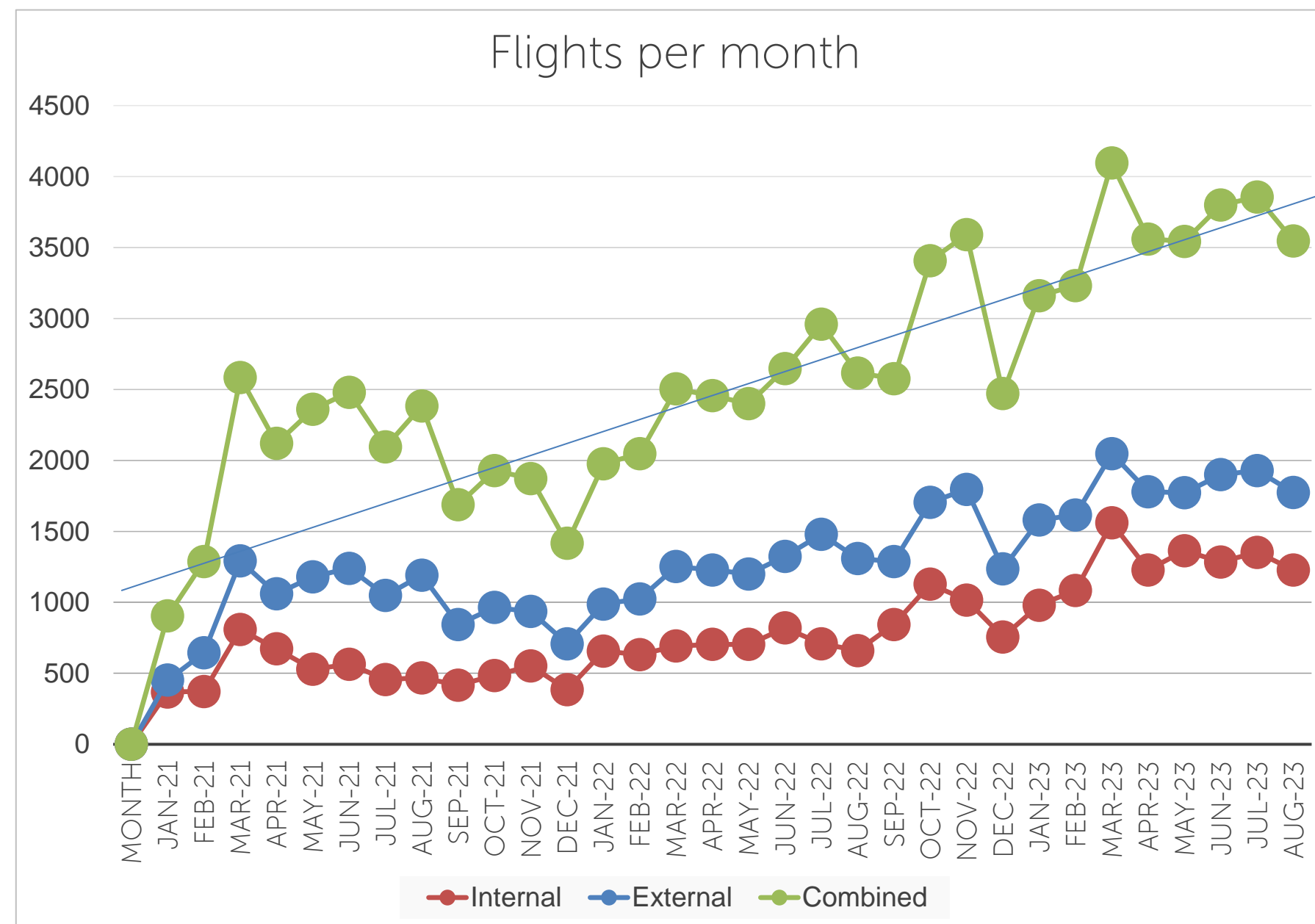
- Create custom "airspace" buffers over infrastructure network
- Create and imply rules for operating flying over network
- Apply notification or approval processes
- View and analyse flight planning information from every operation



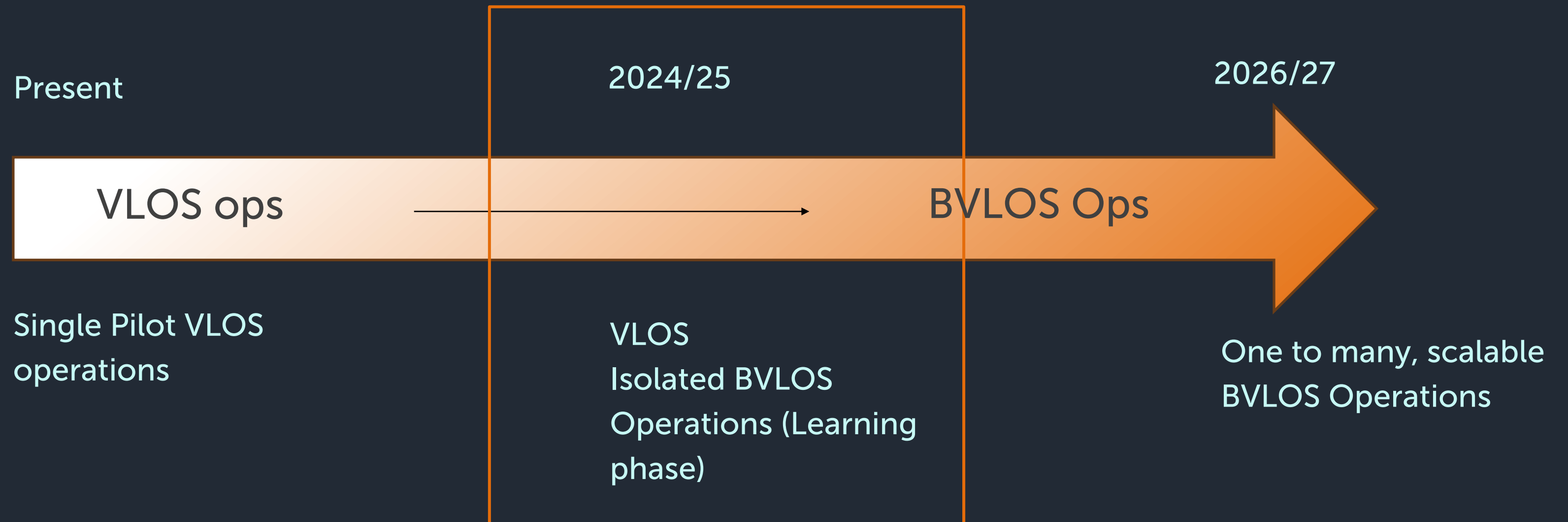
# Positive outcome

What's next?

Journey Continues...



# Next step on the roadmap



# What's stopping us?

By default, regulations restrict drone flights to within Visual Line of Sight (VLOS)

Current way to extend this is to:

1. Apply for a Temporary Danger Area (TDA)
  - Slow & lasts for max 6-9m
2. Use multiple 'Spotters' guiding the pilot (EVLOS)
  - Expensive, complex & limited

Even with TDAs & EVLOS, drones are not operating true Beyond Visual Line of Sight (BVLOS), preventing:

1. Scale - Cost Benefit is low
2. Automation & Autonomy
3. Remote Operation - essential for Drone Hubs



VLOS – Visual Line of Sight



Locked to about 500m

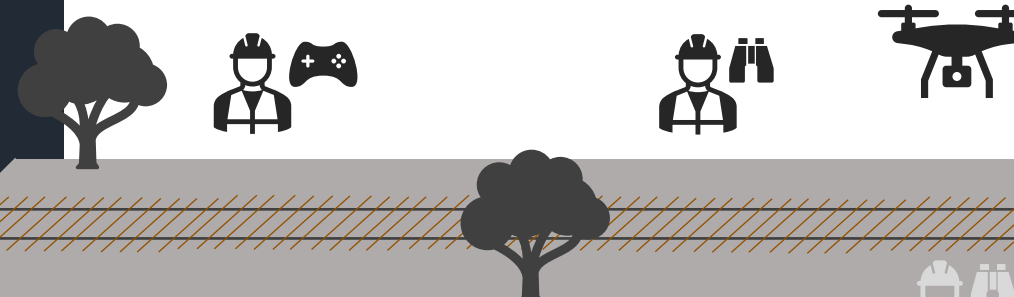
Short flights = inefficient

**TDA - TEMPORARY** Danger Area, allowing BVLOS – Beyond Visual Line of Sight



Red tape = inefficient

Extended Visual Line of Sight EVLOS



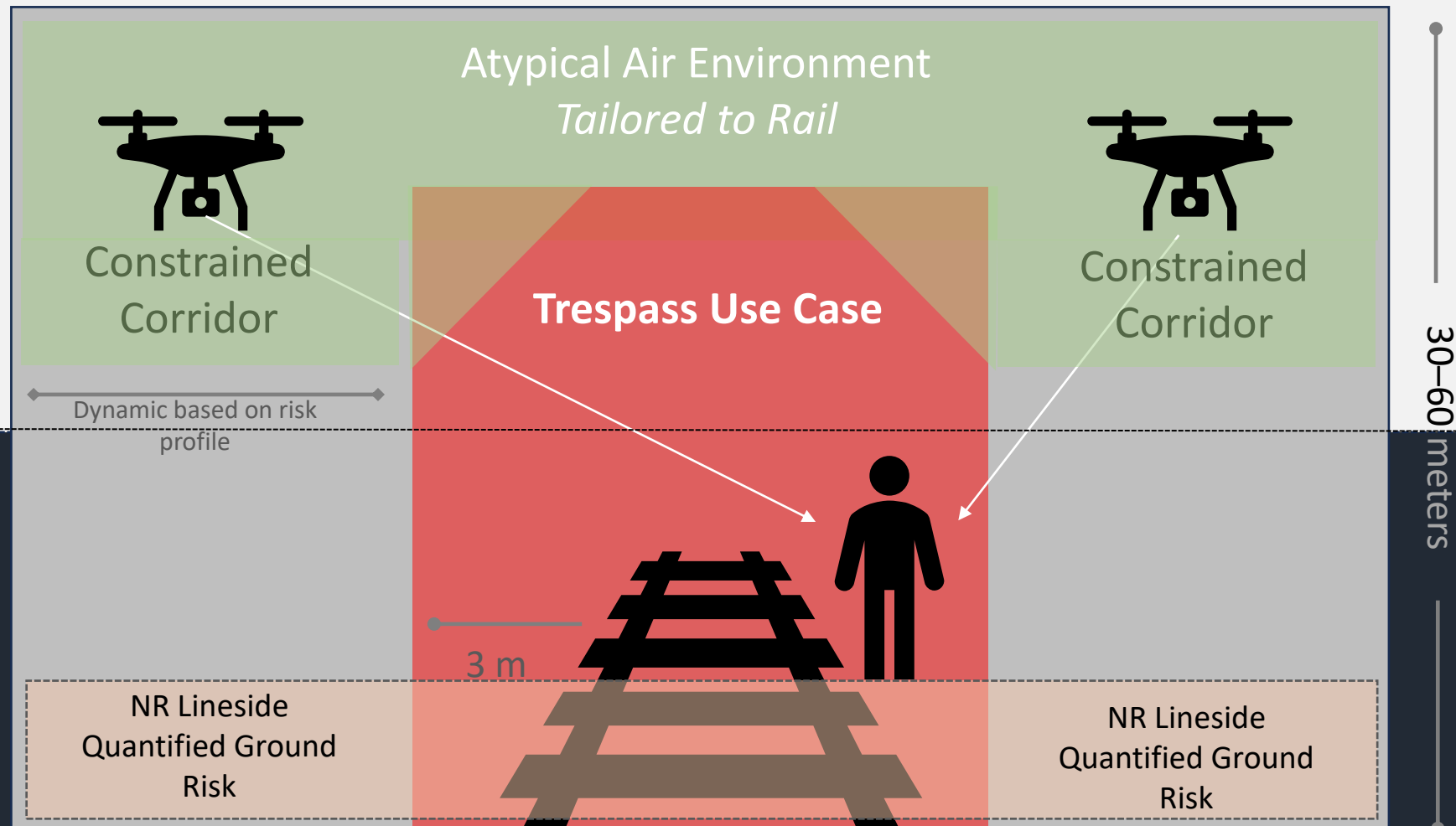
Longer distance = more people

Many people = inefficient

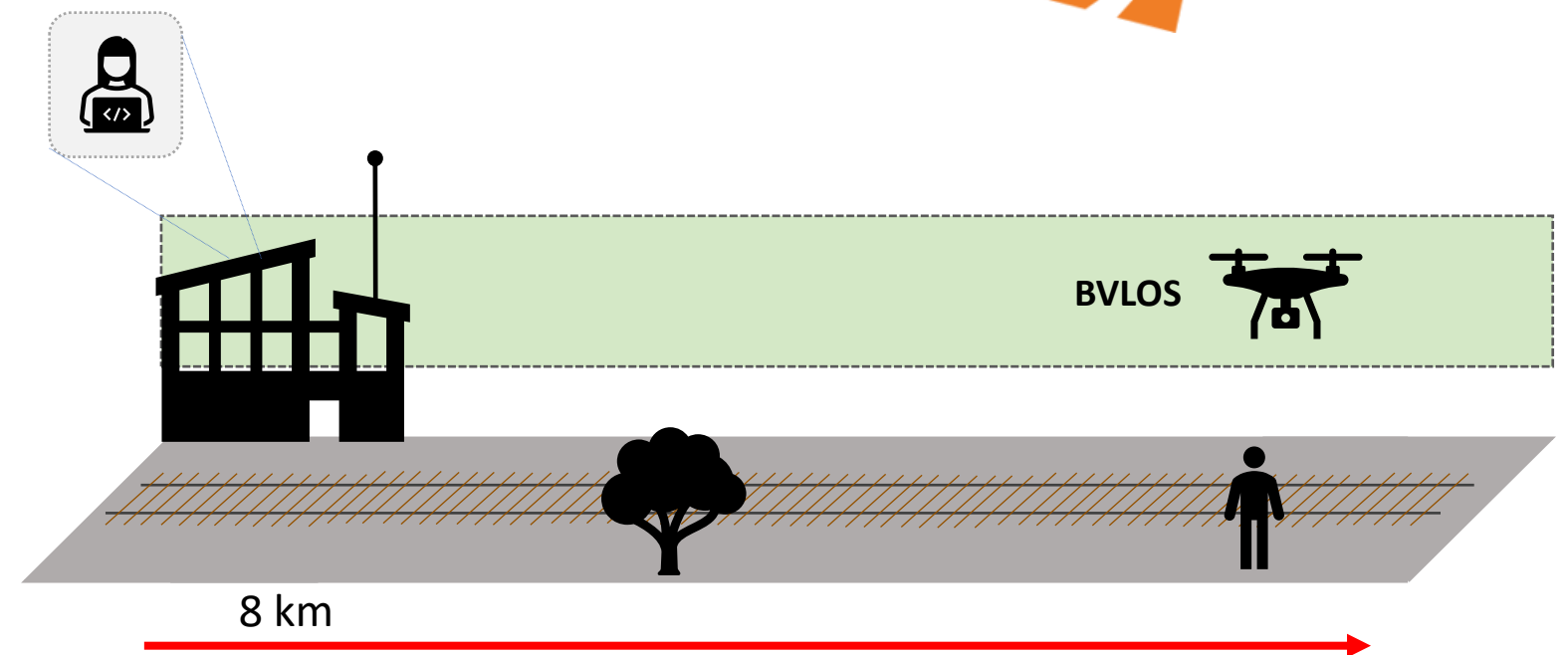
# How are we helping drive the roadmap?



Quantified Air Risk

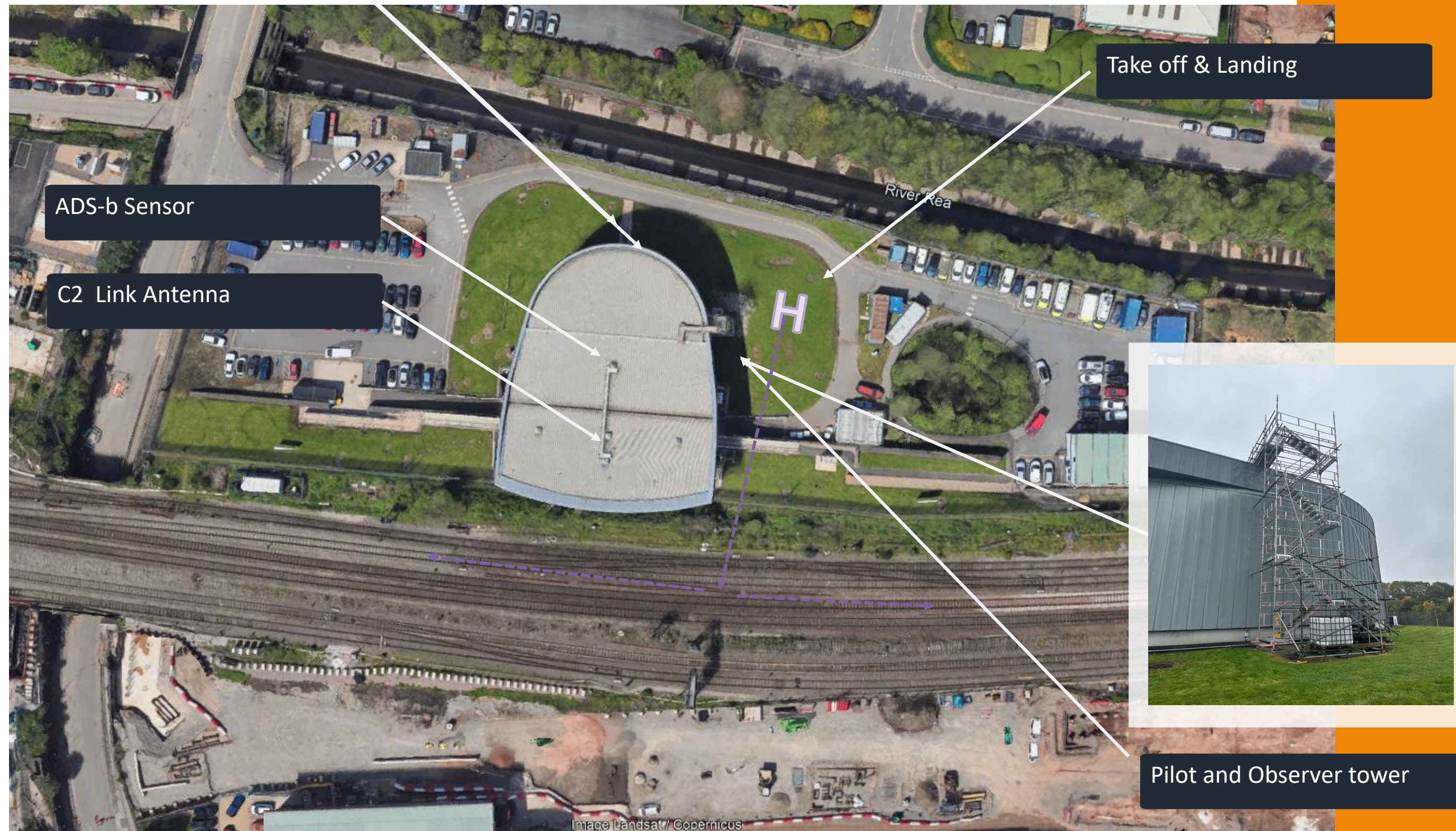


Project to deliver scalable BVLOS specific to the rail environment



# Drone Operations Hub

Birmingham West Midlands Signalling Centre



ADS-b Sensor

C2 Link Antenna


Take off & Landing

Pilot and Observer tower

Image Landsat/ Copernicus

# Inter City Hubs

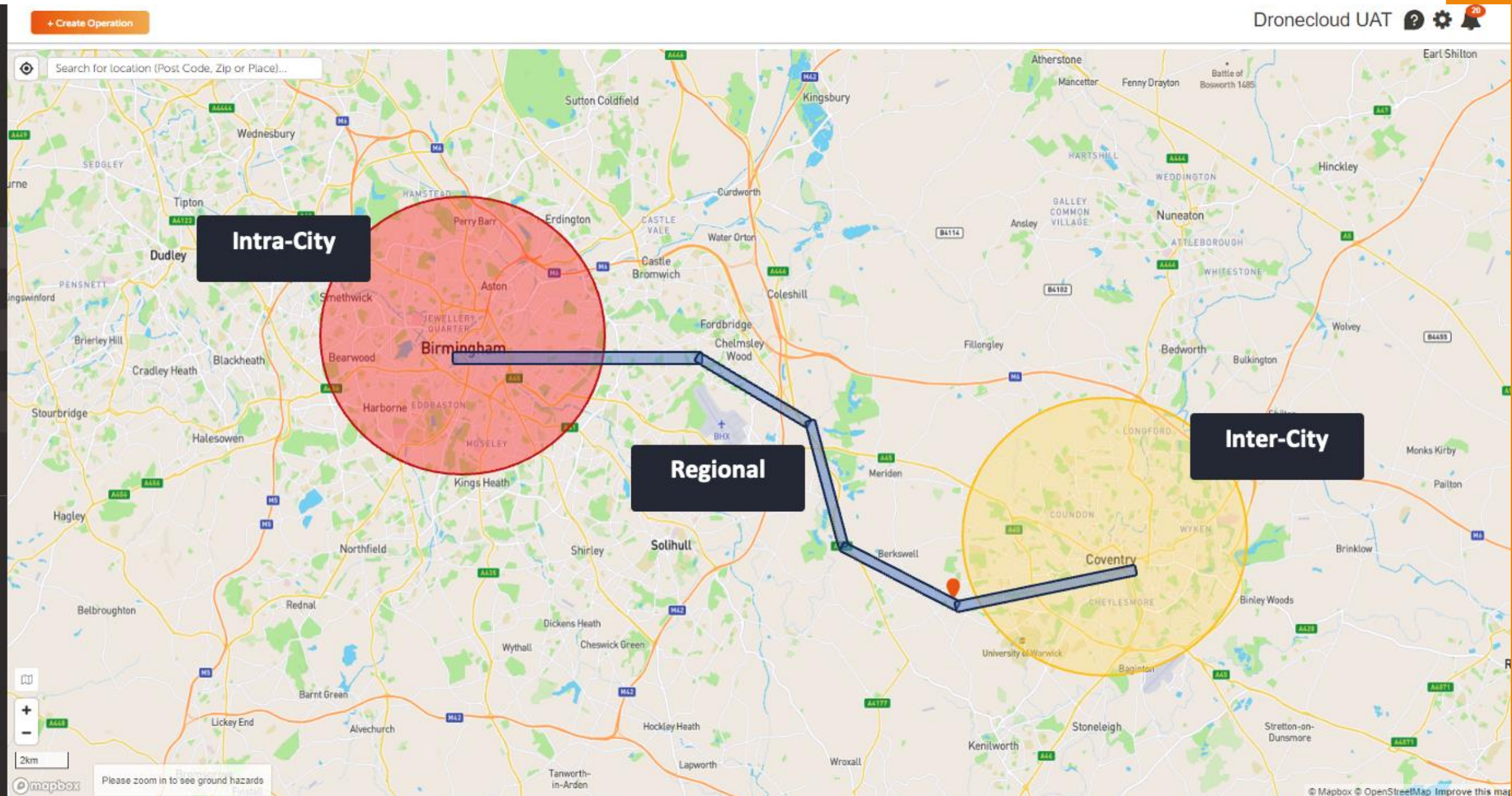
Using the rail network to link regions for seamless drone ops



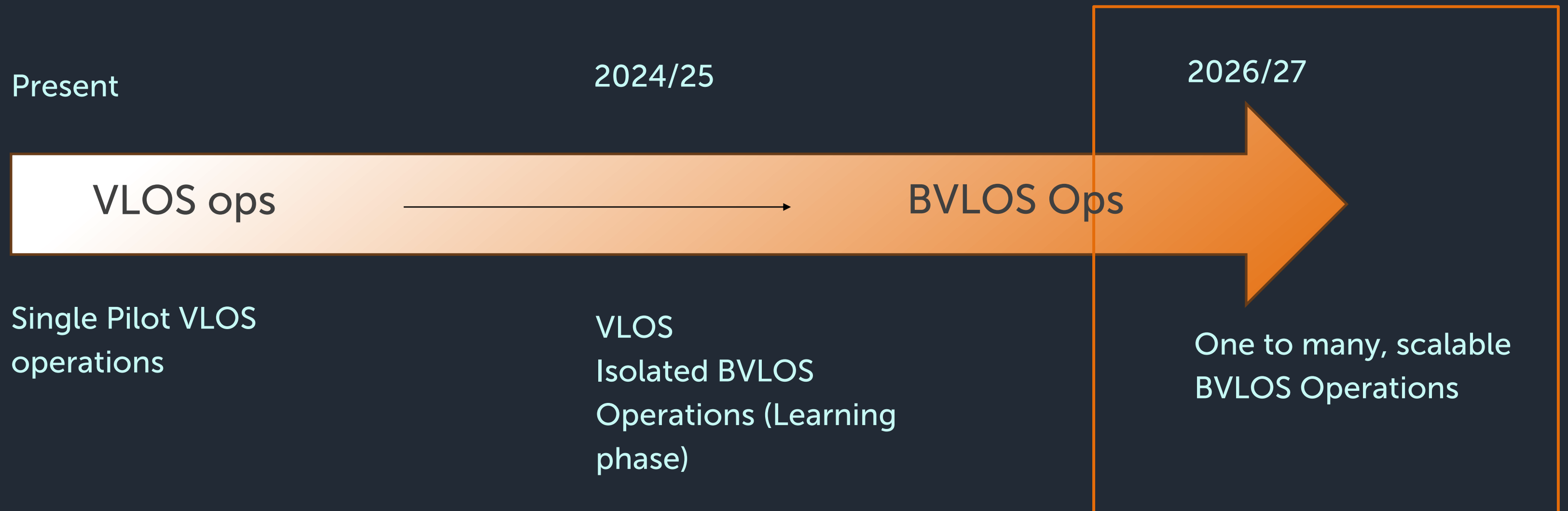
**John Smith**

- Reporting
- Dashboard
- Operations
- Fleet
- Calendar
- Sign out

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# What's next?

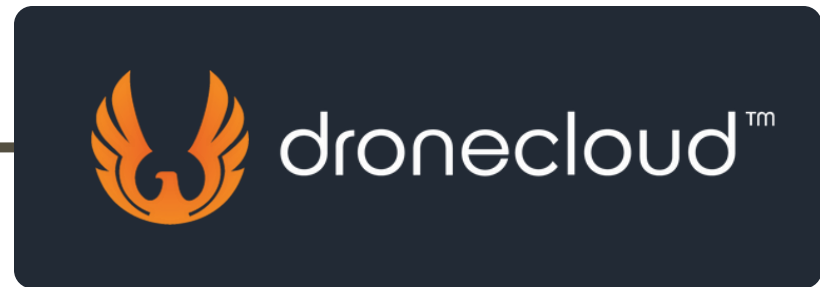




# Turn-Key Solution

Dronecloud Managed Service

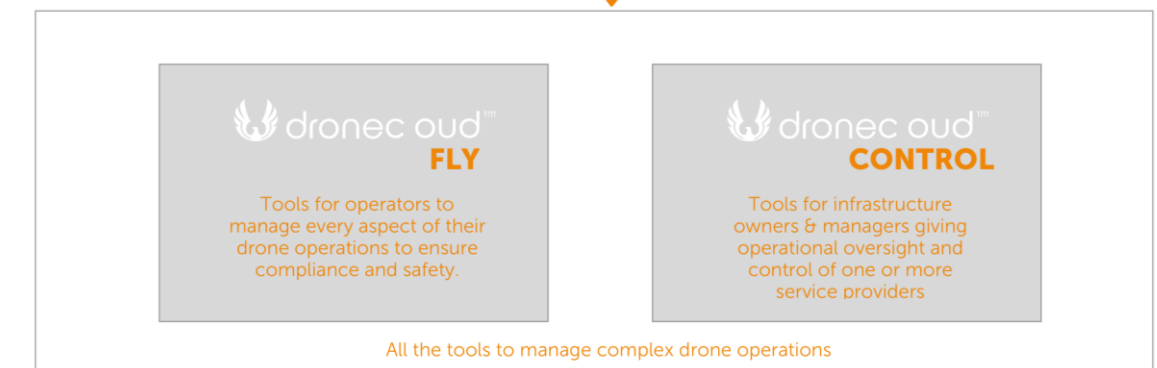
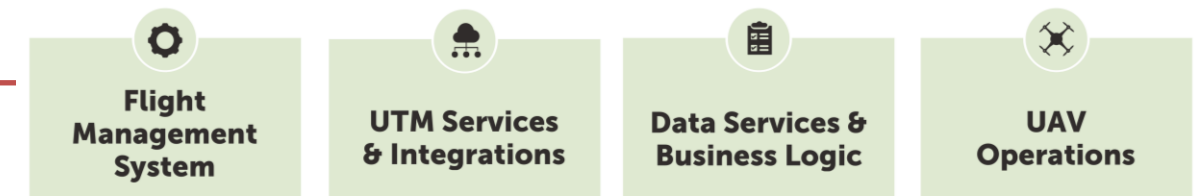
Bringing all parts together for advanced, BVLOS operations



**dronecloud™  
Managed Service**

FLY & Control packaged with local Partners to deliver *'turn-key drone services'*

### Separate service components



**Managed drone services**  
Package & make Complex Drone Operations *'turn-key'* at Scale

- Scale Operations
- Manage Airspace
- BVLOS & Advanced Ops
- Enable Autonomy



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