Mercury Drone Ports Project

Community Engagement
19 Aug 20

Agenda

- Drones, the Opportunity and Drone Technologies Limited (DTL)
- Drones and the challenges
- Mercury Drone Ports
- Why Montrose and Angus?
  - What is a Drone Port and where are they?
  - Drone Port Montrose
  - Schedule
  - What could it be?
- Summary / Questions

Note:
VLOS – Visual Line of Sight
BVLOS – Beyond Visual Line of Sight
UAV – Unmanned Aerial Vehicle – UAS/Drone/RPAS

DTL, Drones and the Future

The Company

- Drone Technologies Limited (DTL) is a young company aiming to exploit the opportunities that will result from the increasing adoption of BVLOS, autonomous drone flight in unsegregated airspace

The Opportunity

- DTL predict increasing numbers of standalone point-to-point trials ultimately leading to regulatory change and the widespread adoption of BVLOS drone delivery and long duration inspection within 3 – 5 years.

The Ask

- DTL seek projects and early commercially viable use cases, in lower risk environments to support the longer term widespread adoption of drone based logistics, inspection services and urban mobility in the UK

"Tell me an industry that drones can't revolutionise?"

Wayne Lording, Drone industry 'thought leader', DTL Australia

The Drone Opportunity

The Market

- Global market increasing from $4Bn to $40Bn 2019 – 2023 (Barclays)
- Worth an additional £42Bn to the UK economy by 2030 (PWC)
- Total accessible market of $1.5Tn by 2040 (Morgan Stanley)

The Future of Flight Challenge (UKRI)

- "aims to position the UK as a world leader in aviation products and markets worth over $675 billion (£559bn) to 2050."

Henry Ford (1940)

- "Mark my words: a combination of airplane and motorcar is coming"

Drone Technologies Limited

- Safer, Greener more efficient alternatives to the status quo

The widespread adoption of drone technology has already begun

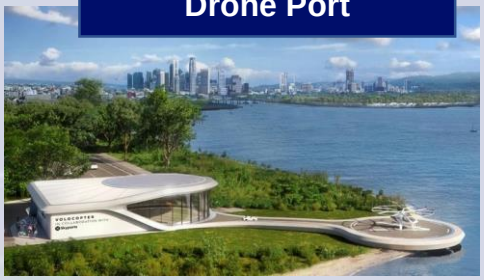
Drone Technology Today

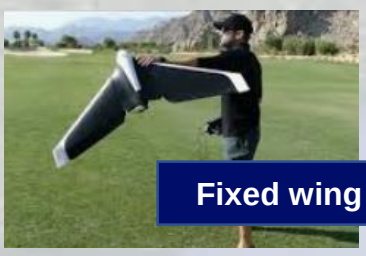
Consumer / VLOS

Delivery: 4kg / 85km

100-225kg / 500km

Drone Port





Fixed wing

Survey: 10kg / 40 mins

200kg / 20 mins / 2 passengers

Hydrogen

225kg / 350km / 8 hours

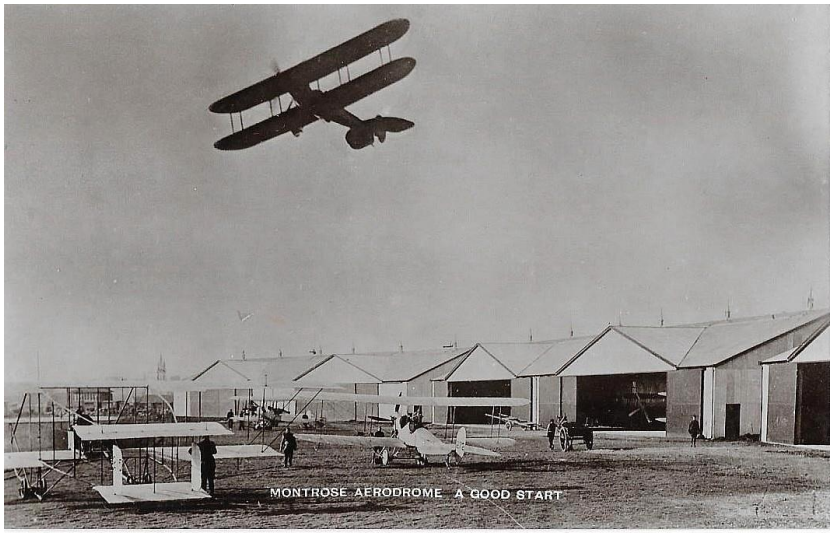
The drone is merely a ‘platform’ – data, Artificial Intelligence (AI), autonomy etc

The BVLOS Challenges

- **“BVLOS, autonomous flight must be of no greater risk to manned aviation than it is today”**
  - Conspicuity, detect and avoid
  - Complete Airspace picture
  - Increasing autonomy
- **Societal Acceptance**
  - Privacy
  - Safety
  - Noise
- **Regulatory Acceptance**
  - Substantial body of evidence demonstrating safe operations
- **The Business Case**
  - Safer, greener, cheaper - but doing what?

Montrose – Pioneering Aviation

1913 – RAF Montrose, the UK's first military aerodrome opens



2020 – Drone Port Montrose, Scotland's first Drone Port opens

Objective: Facilitate the adoption of BVLOS, Autonomous UAV flight

Mercury Drone Ports Principles

Approach

Mercury Drone Ports' Safety Statement

As a fundamental principle of its approach to safety, Drone Port Montrose will continually embrace a culture of openness and a willingness to continually adapt and develop its safety management system in order to facilitate a safe operating environment and demonstrate procedural excellence and transparency to the Regulator (CAA)

Mercury Drone Ports' SMS Principles

Safety First

Procedural Excellence

Positive Contribution to all Stakeholders

Aims

Safe Operations

Societal Acceptance

Regulatory Acceptance

Business Case

Manned aviation at no greater risk from UAV operations than they would be today

Why Montrose and Angus?

6 months 2020 / 21

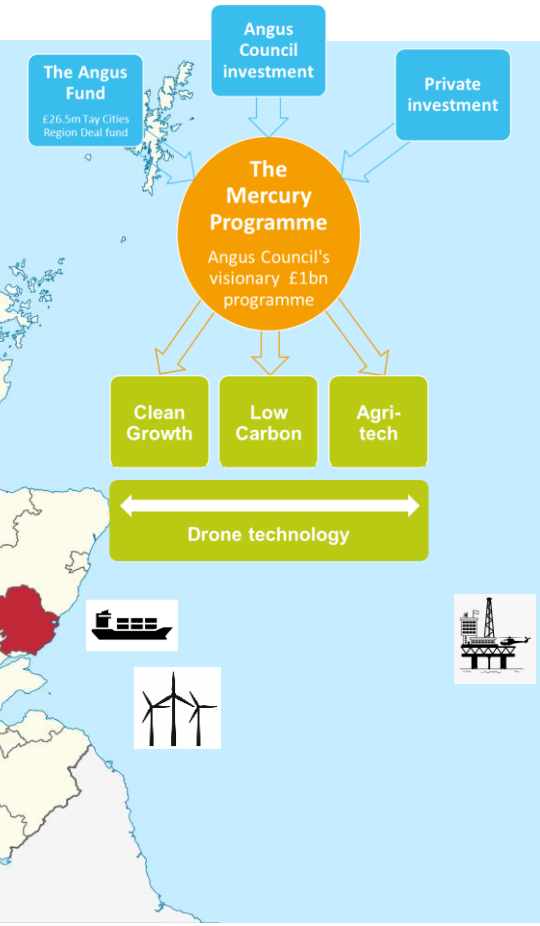
2021 onwards

‘Triad of Opportunity’

Safe Trials Environment
- Quiet Airspace
- Low Population Density

Commercial Use Cases
- Offshore Customers
- Rural Environment

Accessibility
- Central location
- Skilled Workforce



Economic Development Opportunity

Drone Port Montrose
- Temporary Trial Airspace
- Offshore focus

Angus Drone Network
- (More) Permanent Airspace
- Offshore / Onshore Scenarios

Centre of Excellence
- Conferences
- PhD Programme
- Specialist Companies

Triad of opportunity: Safer airspace, accessibility and commercial use cases

Mercury Drone Ports Project

The Mercury Programme

Drone Port Montrose

Airspace Trials Area (Testing and Commercial Operations)

- Drone Deliveries
- Offshore Inspection
- Proof of concept BVLOS application trials
- Airspace management – unsegregated trials
- Drone and systems Certification
- Drone Deliveries – vessels at anchor
- Drone Deliveries and inspection – Windfarms
- Drone Deliveries and inspection – O&G Platforms
- Equipment demonstration
- BVLOS Training

Onshore Facilities

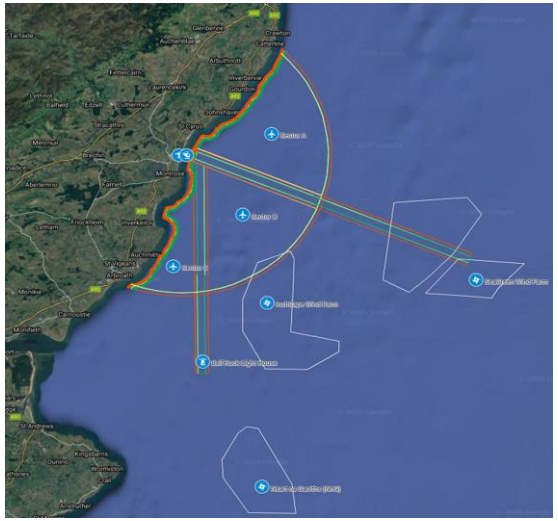
- Take off/ landing area
- Office Space
- Workshops
- Storage
- VLOS training

Angus Drone Network

- Expanded Facilities
- Offshore Trials Area
- Onshore Trials Areas
- Multiple Drone Ports – Rural and Agriculture
- Centre of Excellence
- Specialist companies

Aims: 1) Facilitating the adoption of BVLOS, autonomous UAV flight 2) Economic Development of Angus

Drone Port Montrose



Segregated Airspace Trial Area

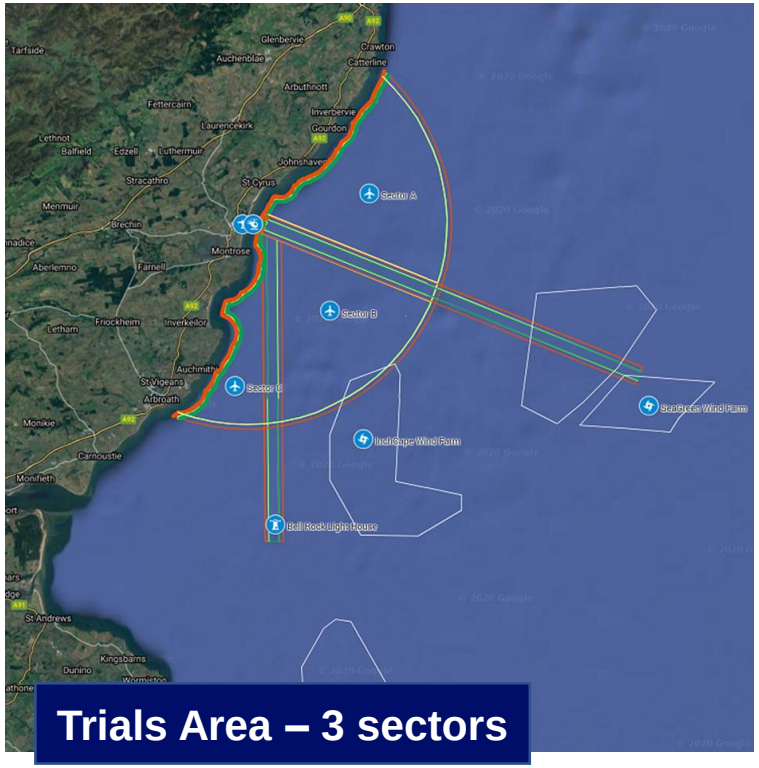
- Temporary with intent to make permanent once business case has been proven
- Segregated airspace for trials 0 – 12nm from shore
- Segregated drone corridors to windfarms and oil and gas platforms
- Planning and application underway

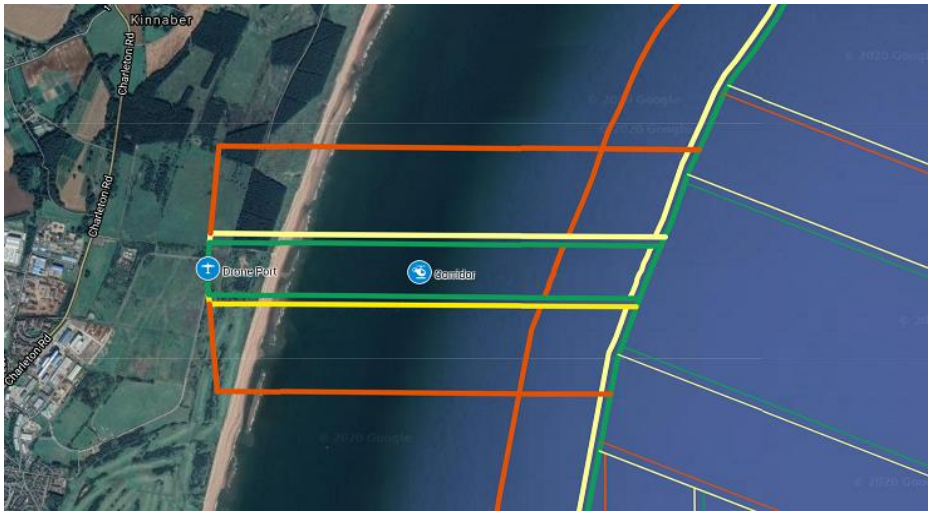
Ground based support facilities

- Coastal location
- Take off / landing area
- Workshops, storage, client offices
- Existing adjacent offshore training facility
- Based at the Zero Four Development
  - 4* hotel opens 2021
  - Renewable Energy Innovation Hub
- Drone Port planning permission submitted

Segregated Trial Airspace supported by premium onshore facilities

Proposed Temporary Airspace Trial Area





Trials Area – 3 sectors

‘Open’ Trials Area

Vessels at Anchor

Drone Corridors

Offshore Windfarms

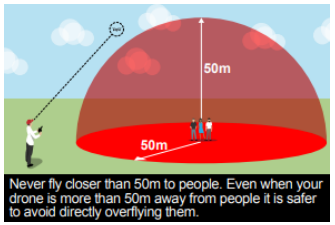
Oil and Gas Platforms

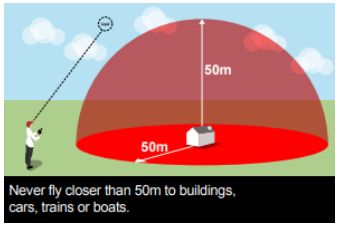
Horizontally and vertically segregated airspace activated by NOTAM

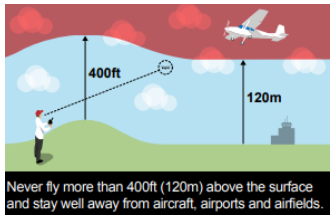
Onshore Trials Area

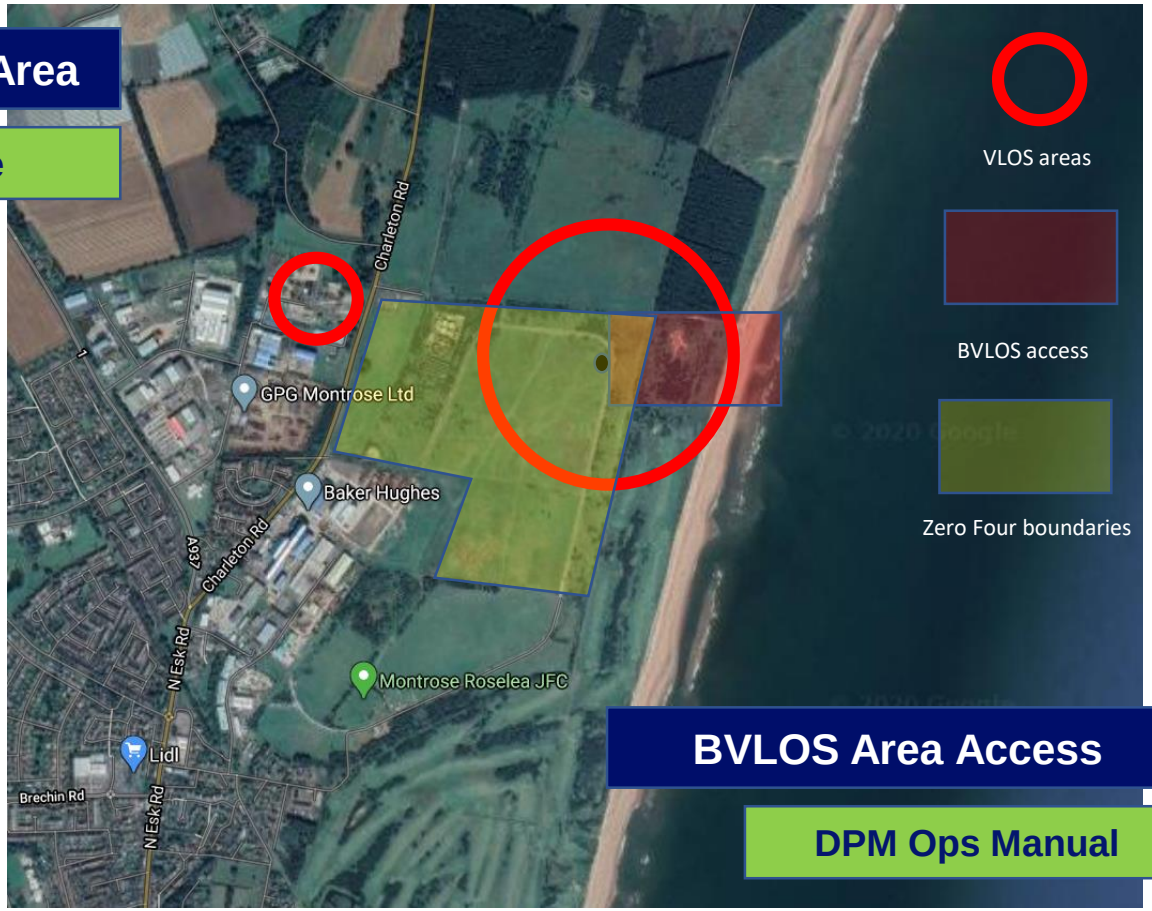
Visual Line of Sight Area

Drone Code







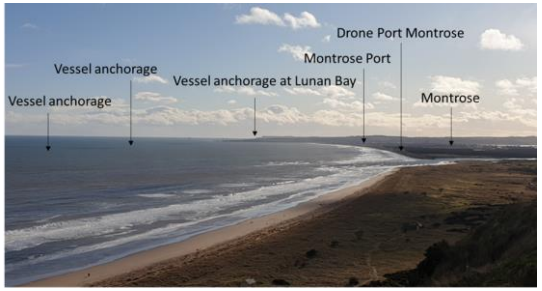


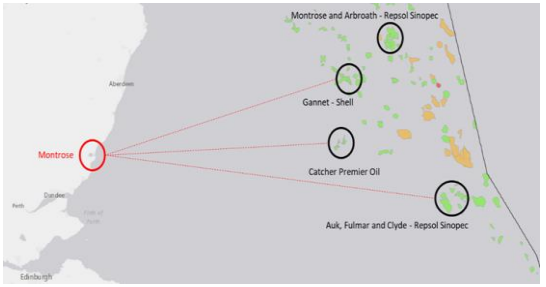
BVLOS Area Access

DPM Ops Manual

VLOS flights conducted using the 'Drone Code'

Angus Drone Network (Phase 3-4 Proposal)



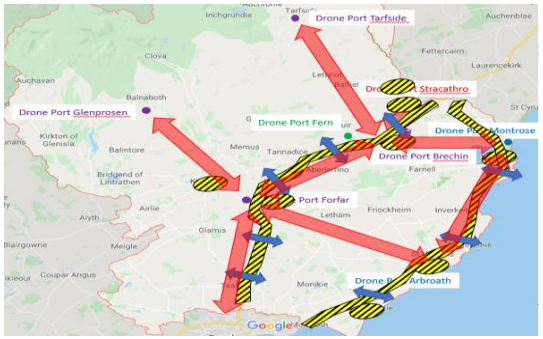


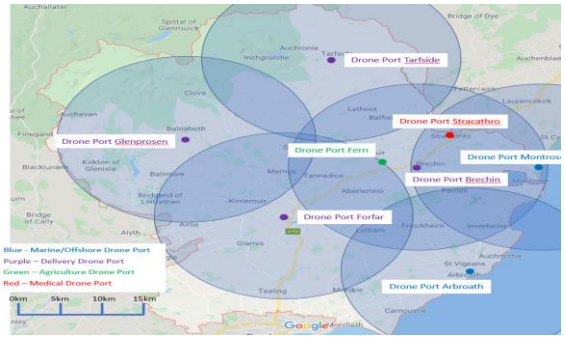
(More) Permanent offshore and onshore UAV Trials Area

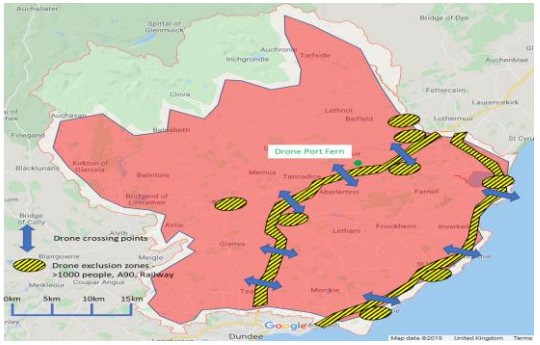
- Multiple drone ports / drone corridors / drone zones
- Multi-scenario – Angus businesses – Mercury Partners

Commercial operations

- Multi-sector – Offshore, agriculture and provision of rural services







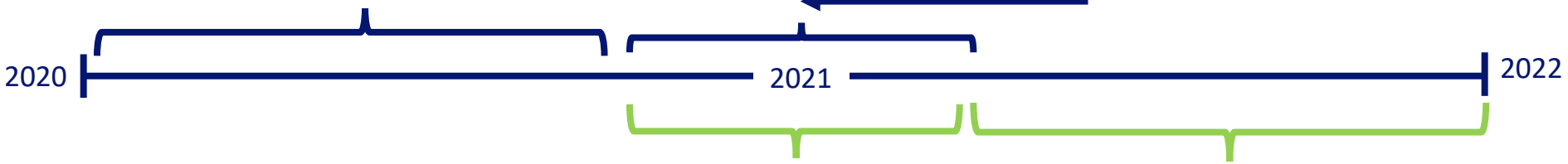
County-wide integrated UAV operations – scalable to Scotland / UK

Mercury Drone Ports Project Schedule

PHASE 1 and 2 – CURRENT APPLICATION

Phase 2 – Montrose Airspace Activation
- Trials and commercial operations
- Proof of concept and lessons learned
- Scope of Application for Permanently Segregated Angus Airspace

Phase 1 – Montrose Airspace Application
- Application for Temporary Airspace Trial
- Mercury Programme Business Case



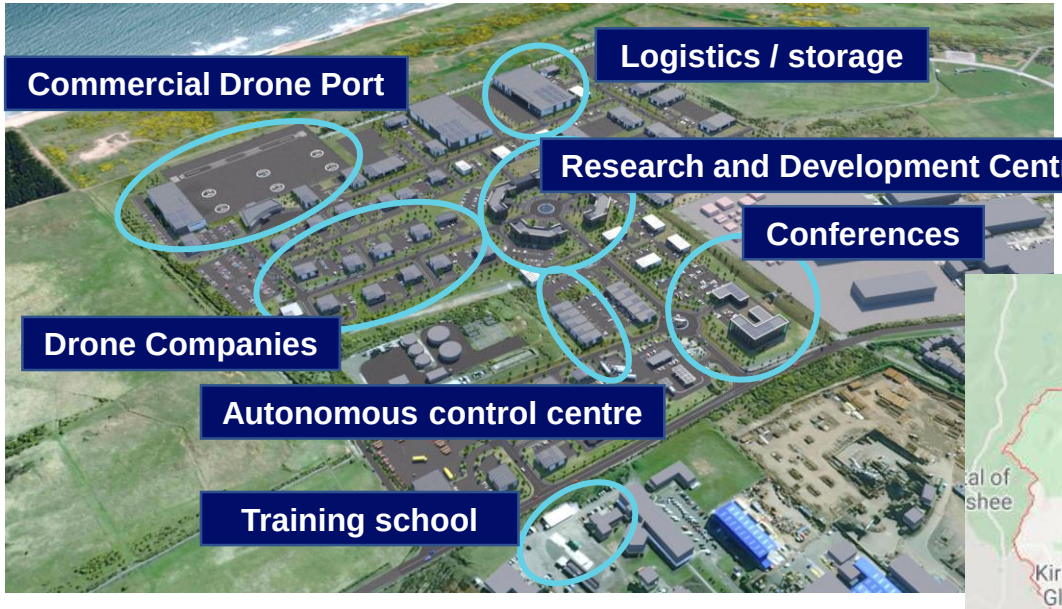
Phase 3 – Angus Airspace Application (tbc)
- Mercury Programme Business Case Approval
- Application for Permanent Segregated Airspace (3-5 year duration)
- Statement of Need / Design / Consultation

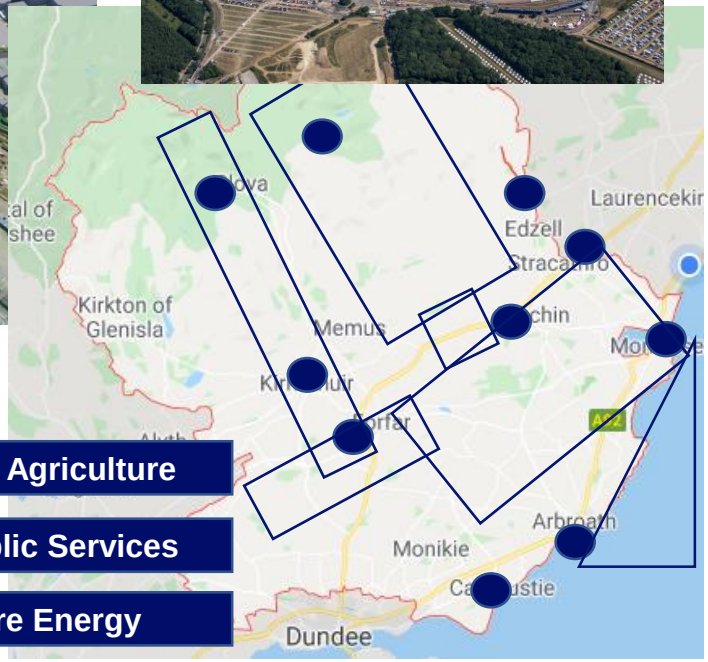
Phase 4 – Angus Airspace Activation (tbc)
- Trials and commercial operations commence
- Creation of Centre of Excellence

PHASE 3 and 4 – FUTURE APPLICATION

Lessons learned from temporary airspace will shape future development

What Could Mercury Drone Ports Become?





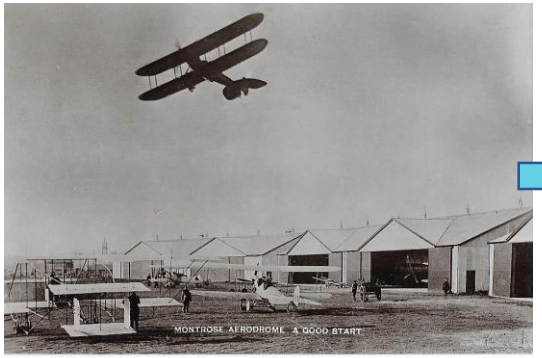
Precision Agriculture

Rural Public Services

Offshore Energy

Incremental, phased development – supported by the community

Mercury Drone Ports Summary



Why?	How?	What?
Safe Trials Environment	Phased development	Economic Development
Commercial Use Cases	Partnerships	Societal acceptance of UAVs
Accessibility	Mercury Programme	Technical Development of UAV

Pioneering economic and technical development project

Mercury Drone Ports

Tay Cities Deal
https://www.angus.gov.uk/taycities

Email Angus Council
TCD@Angus.gov.uk

Email Drone Technologies Ltd
info@drone-technologies.co.uk