



**AERIAL UPTAKE**  
aims to create  
supportive regional  
policies for unmanned  
aerial systems by  
exploring needs and  
barriers to innovation  
and commercialisation,  
including society's  
acceptance of UAS.

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# ACTION PLAN

# LANCASHIRE



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# 1. General information

**Project:** Removing barriers to the uptake of innovative Unmanned Aerial Systems in the EU

**Partner organisation:** University of Central Lancashire (UCLan)

**Other partner organisations involved:** Preston City Council (PCC)

**Region:** Lancashire, UK

**NUTS2 region:** Lancashire

**Contact person:** John Mills

**Email address:** JMills@uclan.ac.uk

**Phone number:** +44 (0)1772 895797

## 2. Background

### Aerial Uptake project

AERIAL UPTAKE brings together local / regional public authorities and key players of the UAS sector from 6 European regions, being pioneers in the creation of a single European drone market. They exchange and transfer knowledge to unleash the potentials of UAS technology for civil and commercial usages. Besides exploring and addressing the key needs and bottlenecks of innovation and commercialization of UAS, partners investigate tailored solutions for increasing societal acceptance by enhancing and articulating positive social impacts of drone technology.

During the course of the project, partners learn from each other exchanging experiences regarding the methods, models and best practices that can help to implement an effective action plan in each of the five partner regions (in the region of the Advisory Partner, no action plan is being prepared). The goal of an action plan is to set the target and structure for revising the policy instruments in the five participating regions towards a more open market for using drones in commerce and business.

The aim of creating the action plans in all regions corresponding to the overall project objective which is:

TO IMPROVE THE PERFORMANCE OF REGIONAL DEVELOPMENT POLICIES AND PROGRAMMES BY STRENGTHENING THEIR CONTRIBUTION TO THE DELIVERY OF NEW TECHNOLOGIES AND FIELDS OF APPLICATION OF UNMANNED AERIAL SYSTEMS (DRONES) FOR CIVIL AND COMMERCIAL USAGES.

To reach the above objective, AERIAL UPTAKE implements interregional learning activities among nine partners and six EU regions along three sub-objectives:

FOSTERING INNOVATION by creating a favourable environment and policy interventions, that facilitate experimentation, real-life testing and demonstration of novel UAS technologies (i.e. through specific experimental zones, urban living labs, removing specific regulatory and administrative barriers, etc.);

PROMOTING MARKET UPTAKE, through supporting and encouraging enhanced (quadruple helix) collaboration, networking and clustering among businesses, research organization, public authorities and potential end-users, also allowing crossovers among different sectors;

IMPROVING SOCIETAL ACCEPTANCE of new UAS technologies by addressing ethical, legal and social concerns, raising public demand for new solutions and due consideration of potential social impacts and benefits, in. e.g. evaluation / monitoring criteria applied in addressed policies.



## Regional context

This section summarises the baseline assessment from our regional analysis in Lancashire.

### What is happening in Lancashire?

Lancashire has been at the forefront of aerospace innovation for over eighty years and is globally significant in advanced engineering and manufacturing. The area is home to the largest aerospace cluster in the UK and the fourth largest in the world (after Seattle, Toulouse and Montreal) with major multi-national companies including BAE Systems and Rolls-Royce.

Lancashire has the single largest concentration of aerospace production in the UK, employing over 20,000 people and remains one of the most important centres for high technology manufacturing nationally.

Our regional UAS PESTLE analysis (see appendix 1), conducted as part of the Thematic Field (TF) Market investigations, demonstrates a rich seam of opportunities spanning the maximisation of pre-existing aerospace infrastructure and specifically around UAV technologies, alignment with central and regional government policy, health and safety benefits and removal of risk for operators, economic expansion, and alignment with environmental drivers to move towards net zero. However, there are a number of barriers and/or threats. These span societal perceptions, challenges around technological adoption and business awareness and regulatory limits for UAS use within the UK. Our action plan therefore spans these factors; seeking to capitalise on the distinct and substantial benefits but to acknowledge and limit the impact of the threats and barriers identified.

There is a strong consortium of quadruple helix partners committed to building upon existing strengths and accelerating UAV development in response to fast-growing global market opportunities.

Key stakeholders include:

**The University of Central Lancashire (UCLan)** - is a leading modern University in the UK with around 38,000 staff and students. In the UK's first Knowledge Exchange Framework (KEF) exercise in 2021, UCLan scored in the top 20% of all English higher education providers in three areas - local growth and regeneration; skills, enterprise, and entrepreneurship; and working with the public sector and third sector.

**NWAA** - the North West aerospace cluster contributes around £7bn to the UK economy. The alliance is mandated to represent and lobby on behalf of the aerospace supply chain. They provide strategic advice.

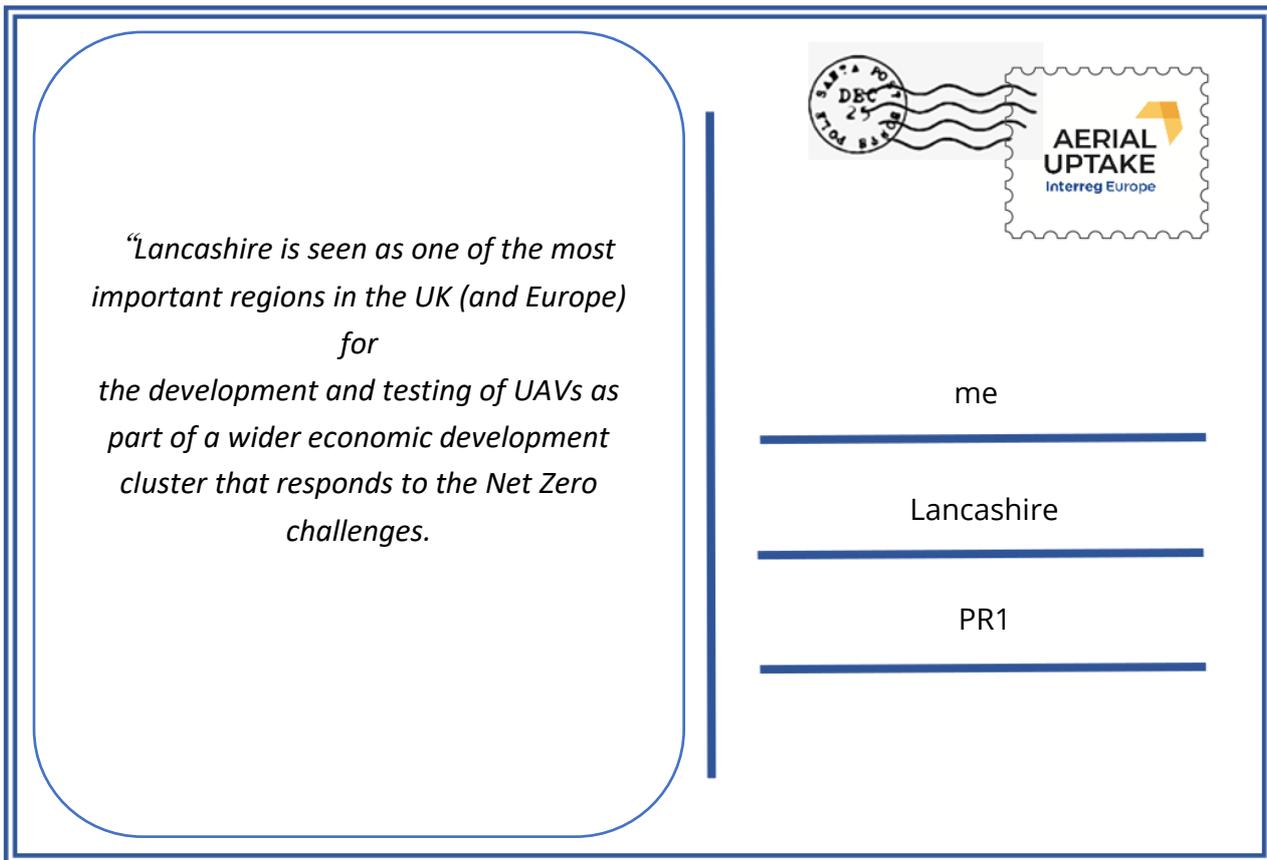
**BAE Systems** - the largest defence company in the UK. BAE Systems have a strong (economic) presence in the region (two local enterprise zones host BAE centres) and have a critical impact on supply chain operations. UCLan have a strong relationship with the organisation around a range of aerospace and UAS activities

**Advanced Manufacturing Research Centre North West (AMRC)** - AMRC North West play a key role in driving recovery, growth, productivity, and innovation, supporting Lancashire firms to compete nationally and internationally. They are creating a high-performing technical R&D team which will enhance the manufacturing base of Lancashire, working with both manufacturing companies and their supply chains.

**Lancashire Local Enterprise Partnership (LEP)** - with a broad economic remit to secure a £1bn growth plan, the LEP is targeted to create 21,000 new jobs via a number of investment strategies that include the £450m City Deal and the £320m Growth Deal. The Partnership is a key stakeholder in facilitating the growth of UAS ecosystem.

**Preston City Council (PCC)** - with 48 elected representatives and directorates spanning communities and environment, development and housing, PCC is the city-wide council in the Preston area and has worked with UCLan on multiple UAV initiatives.

## Vision



Our vision is to build upon existing regional strengths and provide the UK with a world-class innovation cluster for the development, testing and manufacture of civil Unmanned Aerial Vehicles.

The centre will support the development of a major new economic development cluster in the North of England capable of retaining and creating the high skilled jobs of the future and responding to the Net Zero challenge.

We are seeking additional collaboration, support and investment to accelerate and scale these activities to ensure the UK develops sovereign capability and competes with other countries in fast-growing markets. This UK capability will include the manufacture of large drone platforms.

## 3. Policy context

### The Action Plan aims to impact:

- Investment for Growth and Jobs programme
- European Territorial Cooperation programme
- Other regional development policy instrument

## The policy context and the contribution to improve the policy instrument

There is a complex and fast changing regional policy environment in the UK. These changes have largely been driven at the national level in response to Covid-19, Brexit and the increasing importance of responding to the effects of climate change. Despite these changes, the vision for the Lancashire UAS cluster has remained highly relevant to the regional policy discussion. Informed and supported by the Aerial Uptake project, the Lancashire UAS cluster has and will continue to take a flexible approach to successfully influencing key regional policy and investment programmes.

The existing policy and programme instruments already influenced by the project are

- the EU Structural and Investment Funds Strategy (ESIF) for Lancashire 2014-20; Type 1: implementation of a new project and;
- the Lancashire Local Growth Deal Programme, Type 1 implementation of a new project.

The emerging policy and programme instrument currently being influenced by the project is

- Lancashire Growth Plan (formerly Lancashire Industrial Strategy) – it is hoped to realise a Type 1 implementation of a new project policy change by attracting funding for a specific project for a Lancashire UAS cluster. However, this may necessarily take the form of policy development during Phase II with the aim of securing funding and longer-term territorial effects from this or other emerging funding streams.

### **EU Structural and Investment Funds Strategy (ESIF)**

The Department for Business Energy and Industrial Strategy (BEIS) (Previously Department for Business Innovation and Skills) leads for the UK government on policy for the European Structural and Investment Funds (including ERDF and ESF) and on the UK Partnership Agreement.

Each of the 38 Local Enterprise Partnership in the UK has its own Structural and Investment Funds Strategy outlining local economic growth conditions and priorities framed within the context of the 2014-2020 European Structural and Investment Funds (ESIF) Growth Programme.

Running from 2014 to 2020, and delivering funding until the end of 2023 in the UK, there are 3 types of funds involved in the programme, including European Regional Development Fund (ERDF) that supports research and innovation, small to medium sized enterprises and creation of a low carbon economy. Aerial Uptake programme is aligned to ERDF Objective 1.2. Improving innovation delivery policies.

## **Lancashire Growth Deal Programme**

The Lancashire Growth Deal is a £320M (373M Euros) programme, secured by the Lancashire Local Enterprise Partnership (LEP) from Central Government to support economic growth across Lancashire.

The Lancashire Growth Deal aims to realise the growth potential of the whole of Lancashire, building on key local economic assets including the universities. The Growth Deal brings together local, national and private funding as well as new freedoms and flexibilities to focus on 4 key priority areas:

- Releasing Growth Potential - by strengthening transport connectivity to create jobs and enable housing development;
- Supporting the renewal and growth of Blackpool;
- Growing the local skills and business base; and
- Innovation and manufacturing excellence.

## **Lancashire Growth Plan (formerly Lancashire Industrial Strategy)**

Local Industrial Strategies (LIS) were required by UK Government to be prepared by the 38 Local Enterprise Partnerships (LEPs) in the UK. The Local Industrial Strategies were intended to ensure; that the geographical areas covered by the LEPs are 'able to increase productivity and realise their potential'; and show 'how they will allow all communities to contribute to, and benefit from, economic prosperity'. The strategy is driven by productivity, innovation and internationalisation and underpinned by a robust evidence base.

Although there is no direct budget associated with the individual strategies, the documents set out the region's main regional economic development investment propositions to UK Government. The priority projects included in the strategy would then be expected to develop business cases for funding and support from a range of Government agencies including the UK Shared Prosperity Fund (UKSPF) which is set to be launched in 2022 and worth c£1.5bn per year

The Lancashire Local Industrial Strategy was expected to be launched in summer 2021, although the format and timeframe has now changed, and the strategy is now being aligned with UK Government's Plan for Growth. Despite these changes, the underlying evidence base, priority, and objectives will remain largely unchanged.

Lancashire Industrial Strategy Evidence Base, 2019<sup>1</sup> - includes the following priorities:

- Start-ups, scale-ups, internationalisation to make the future – Raise business density, start-ups, survival rates, and build on scale-up success. UAS adoption provides the potential to create an attractive new offer for Lancashire as a place to do business, increasing business densities and survival rates and subsequently driving production.

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<sup>1</sup> <https://lancashirelep.co.uk/wp-content/uploads/2019/09/Lancashire-LIS-Evidence-Base-DRAFT-v3.8-part-1.pdf>

- Growth across all sectors with a focus on adding value to existing goods/services and inventing new goods/services to drive productivity. UAS adoption will add to Lancashire's key strength in aerospace and allow the area to benefit from an emerging sector with large potential to have transformational change.
- Harness supply chains to stay ahead – Supply chains serving Aerospace, Automotive, Marine and Energy sectors are fusing due to technology (digital) and materials (light weighting) convergence. Given supply-chain rationalisation, firms need support to innovate to stay ahead in these sectors. The UAS sector will be able to take advantage of the already established innovation assets in Warton, Burnley, Lancaster and Preston and supply chains.

### **Policy Change:**

Action 3: As part of Lancashire's Aerial Uptake activities, the region has already secured a type 1 policy change action through the Lancashire Growth Deal Programme during Semester 3. This was an investment of €1.5m in August 2020 from the Lancashire Local Enterprise Partnership (LEP) for specialist drone equipment through a Drone Command and Control Centre (DCC). This was approved by the Joint Secretariat on 5<sup>th</sup> July 2021. The aim of the project is to purchase drone equipment and use it to work with regional UAV businesses and end users to develop their businesses, in particular to encourage local government take up of drone technologies.

Action 2: Another type 1 policy change - securing investment for a new project - has been reported to the Lead Partner of the Aerial Uptake project as part of the Semester 4 Partner Report and is subject to Joint Secretariat approval. Based on good practice from project partner Enschede in the Netherlands, the region secured funding in May 2021 from the EU Structural and Investment Funds Strategy (ESIF) for a new project called the Lancashire Innovation Drone Zone (LIDZ), a key step in the development of a UAS cluster. This complements and builds on Action 3 with the aim of the project to grow the UAS market to strengthen the case for a UAS cluster, by providing specialist drone technology and related research and development support to new and existing small and medium sized enterprises (SMEs) in Lancashire.

### **Type 1 change: implementation of new projects**

Lancashire Growth Deal Programme

As part of the development necessary to lever in funding and buy-in to underpin proposal for a Drone Innovation Zone, UCLan applied for funding to be able to buy essential UAV equipment through the Lancashire Growth Deal to support businesses and create jobs in the UAV sector.

UCLan was successful in securing £1.2m (Euros 1.5m) grant in August 2020 through the Lancashire Growth Deal for UAV equipment.

The grant has enabled UCLan to purchase drone equipment and use it to work with regional UAV businesses and end users to develop their businesses, a key outcome of the Aerial Uptake project in

Lancashire, job creation. An additional fund of £140K (€165k) was provided by the university in support of this grant, bringing the total spend available to £1.34M (€1.5m)

EU Structural and Investment Funds Strategy (ESIF) for Lancashire 2014-20

UCLan submitted an application to the European Regional Development Fund's (ERDF) business support programme for a project to provide specialist drone technology and related research and development support to new and existing small and medium sized enterprises (SMEs) across Lancashire.

This was to accelerate the ambition of a Lancashire UAV Innovation Cluster to combine the unique testing environment in Lancashire with a strong business ecosystem to accelerate the UK's unmanned aerial vehicle industry.

In May 2021 the ERDF business support programme awarded the University of Central Lancashire £1.8 million (€2m) for the project.

This is through the 2014-2020 European Structural and Investment Funds (ESIF) Growth Programme, Priority Axis 1: Promoting Research and Innovation.

The name of the project is the Lancashire Innovation Drone Zone (LIDZ) project. The objective is to provide long-term support to drone sector businesses and drone end users in the region.

The ERDF project provides grant of 1.3m EUROS with a further 0.8m EUROS from the University giving a total project of 2.1m EUROS. The project is the basis for increasing the number of businesses in the region by bringing new drone technologies and services to market.

### **Planned Policy Change:**

The drive to develop the UAV sector in Lancashire has been clearly articulated in a proposal for a Lancashire Drone Innovation Zone with support from the Lancashire LEP as one of the region's propositions for the Lancashire's Local Industrial Strategy (now Growth Plan).

The Strategic Business Case sets out the case for £50m of investment to respond to a major international opportunity to provide the UK with a world-class innovation cluster for the development, testing and manufacture of civil Unmanned Aerial Vehicles (UAVs) in Lancashire. The document argues that Lancashire is well placed to respond to and capture a share of this rapidly growing and disruptive market.

The Strategic Business Case has been submitted to HM Treasury (with Lancashire LEP support) as part of the Government's Comprehensive Spending Review (CSR) exercise. Partners received acknowledgement that from Government that the plans would form part of their review.

However, as discussed above, a Type 1 change: implementation of a new project may not be feasible during the lifetime of the Aerial Uptake project as Central Government has shifted its emphasis to post Covid-19 recovery and the LIS now forms part of the evidence base for the Government's Plan for Growth strategy. Lancashire Growth Plan (formerly Lancashire Industrial Strategy).

The aim is to realise a Type 1 change by attracting funding for a specific project for a Lancashire UAS cluster based on good practice from Aerial Uptake and building on success of the projects described in Actions 2 and 3. However, this may take the form of policy development during Phase II with the aim of securing funding and longer-term territorial effects from this policy instrument or other emerging funding streams.

## 4.1 Action 1 – Establish a re-focused Steering Group to support cluster development

The opportunity to learn from international case study examples of other European clusters has enabled us to consider elements of their models to develop our plans in Lancashire, such as the co-location of start-ups on-site at a dedicated test centre, for our own Lancashire Drone Innovation Zone (Cluster).

The interregional learning has haled us to evaluate our own strengths, opportunities and weaknesses in this space and has greatly informed the development of the Lancashire cluster plans.

*An important best practice and learning point is about “the benefits of setting out a CLEAR VISION for the cluster - and what it can do for different stakeholders” which has been articulated well in the Business Case for a Lancashire Drone Innovation Zone (Cluster). That VISION is really important as it enables the cluster stakeholders to come together and have a common purpose and it helps us quickly identify what things can help us achieve the vision, or not.*

The first action for the Lancashire region therefore is to establish a refreshed and re-focused Regional Steering Group to develop key cluster related activities such as described in Action 2 and Action 3 with the overarching ambition of creating a Lancashire Drone Innovation Zone and realising the vision that Lancashire is seen as one of the most important regions in the UK (and Europe) for the development and testing of UAVs as part of a wider economic development cluster that responds to the Net Zero challenges.

These activities cross a range of priority areas that have been influenced by the Aerial Uptake project through interregional learning and thematic field work.

The Steering Group will be based upon the Aerial Uptake project’s existing Regional Stakeholder Group, involving quadruple helix partners that span public policymakers, regional UAV- related SMEs, international aerospace manufacturers, local councils, and representative organisations.

More information on some key stakeholders:

**The University of Central Lancashire (UCLan)** - is a leading modern University in the UK with around 38,000 staff and students. In the UK’s first Knowledge Exchange Framework (KEF) exercise in 2021, UCLan scored in the top 20% of all English higher education providers in three areas - local growth and regeneration; skills, enterprise, and entrepreneurship; and working with the public sector and third sector.

**NWAA** – the North West aerospace cluster contributes around £7bn to the UK economy. The alliance is mandated to represent and lobby on behalf of the aerospace supply chain. They provide strategic advice.

**BAE Systems** – the largest defence company in the UK. BAE Systems have a strong (economic) presence in the region (two local enterprise zones host BAE centres) and have a critical impact on supply chain operations. UCLan have a strong relationship with the organisation around a range of aerospace and UAS activities

**Advanced Manufacturing Research Centre North West (AMRC)** - AMRC North West play a key role in driving recovery, growth, productivity, and innovation, supporting Lancashire firms to compete nationally and internationally. They are creating a high-performing technical R&D team which will enhance the manufacturing base of Lancashire, working with both manufacturing companies and their supply chains.

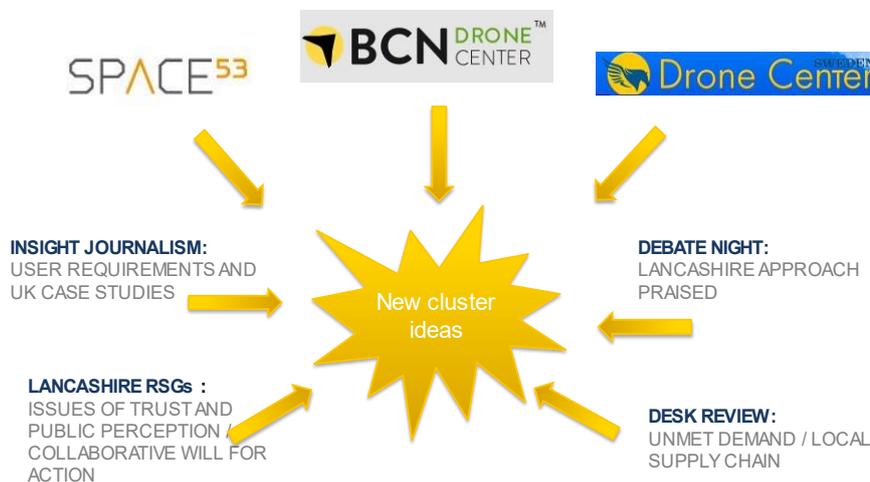
**Lancashire Local Enterprise Partnership (LEP)** – with a broad economic remit to secure a £1bn growth plan, the LEP is targeted to create 21,000 new jobs via a number of investment strategies that include the £450m City Deal and the £320m Growth Deal. The Partnership is a key stakeholder in facilitating the growth of UAS ecosystem.

**Preston City Council (PCC)** – with 48 elected representatives and directorates spanning communities and environment, development and housing, PCC is the city-wide council in the Preston area and has worked with UCLan on multiple UAV initiatives.

A key objective of the group is to ensure that the Lancashire region secures a significant share of the UK’s drone related development and trials work.

The main lessons learned, and good practice gained from the Aerial Uptake project are outlined below:

## Interregional Learning



<b>Lessons Learned</b>	<b>Source of the Lesson</b>
Benefits of providing a forum for stakeholders to debate and develop an overall vision for a regional drone cluster	<p>Enschede case study (includes a visit to Space 53 to see the benefits of an established drone cluster).</p> <p>Regional needs analysis from Market theme (see Appendix 1)</p> <p>Discussions with other partners - regional and interregional</p> <p>Visit to Sweden to see their strong university links, supporting industry, and dedicated UAV test sites.</p>
Benefits of having a group to support the development of an overall business case and investment case.	Enschede case study
Benefits of having a defined group to develop and co-ordinate communications / engagement activities	The AU project has informed the vision and objectives for the Drone Cluster as set out in the Strategic Business Case
<i>Are there any examples of where other regions have had senior level champion(s) e.g. technical and political??</i>	Yes, Swedish involvement from industry champions (SAAB).

The main activities that form part of action 1 are outlined in the table below.

<b>Sub actions / Objectives</b>	<b>Success factors</b>
Produce a revised TOR and membership for the group	Within 2 months of Action Plan submitted.
Hold 2-4 meetings per year	2-4 meetings held over the next 12 months
Inform and own regional and policy strategy development plans.	The 'Drone cluster' continues to be identified as a priority for Lancashire in its economic development propositions to regional and national stakeholders.
Encourage collaboration and partnership between members of the Lancashire drone cluster	<i>Work in progress</i>

Develop and implement a communications strategy to influence public perception of drones as a point of pride for Preston as a city and Lancashire as a region	Higher levels of press outputs
Support the delivery of the funded projects and the establishment of UAV research and development cluster: Lancashire Drone Zone	<i>Work in progress</i>

## Stakeholders engagement in the action

The core stakeholders described above will continue to lead the Group’s activities supported by a wider consortium of members. These will include organisations such as:

BAE Systems, aerospace and UAV supply chain SMEs, SMEs who operate drones, North West Aerospace Alliance, the Advanced Manufacturing Research Centre North West, Preston City Council, Lancashire County Council, the University of Central Lancashire, Federation of Small Business, Lancashire Fire and Rescue, Lancashire Constabulary, the Department of Business, Energy and Industrial Strategy, the regional Chambers of Commerce and the Lancashire Enterprise Partnership.

We aim to appoint a chair from these groups who can contribute to the region development of UAV interests. UCLan will convene the group and own the process for inviting and appointing a chair person.

## Timeframe and cost

The timeframes for specific actions are highlighted in the table above.

The costs to facilitate the revised Steering Group are minimal and will be funded by the existing drone related projects in Lancashire. Meetings will be held within the University’s Engineering Innovation Centre and, or online.

## Target group

As defined in the Terms of Reference and membership for the revised Regional Steering Group.

## Risk factors

Risks Description	Owner	Probability	Impact	Mitigation
Lack of interest from stakeholders to attend and actively participate.	Chair	Low	High	Continue to communicate a clear vision, objectives and benefits for the regional cluster.  Review membership.

The policy landscape means that there is no longer the opportunity to develop a regional drone cluster in Lancashire.	Chair	Low	High	Continue to work with regional partners to influence national government in the development of relevant policy and investment.
Other UK regions establish themselves as predominant Drone Clusters and there is no policy or investment opportunity for Lancashire.	Chair	Low	High	Continue to use the Group to lobby national government.

## Summary

### Policy Change

The drive to develop the UAV sector in Lancashire has been clearly articulated in this proposal for a Lancashire Drone Innovation Zone with support from the Lancashire LEP as one of the region's propositions for Lancashire's Local Industrial Strategy.

The Strategic Business Case sets out the case for £50m of investment to respond to a major international opportunity to provide the UK with a world-class innovation cluster for the development, testing and manufacture of civil Unmanned Aerial Vehicles (UAVs) in Lancashire. The document argues that Lancashire is well placed to respond to and capture a share of this rapidly growing and disruptive market.

However, as discussed previously securing investment for such a new project may not be feasible during the lifetime of the Aerial Uptake project from this policy instrument, as Central Government has shifted its emphasis to post Covid-19 recovery and the LIS now forms part of the evidence base for the Government's Plan for Growth strategy. Lancashire Growth Plan (formerly Lancashire Industrial Strategy).

The aim is still to realise a Type 1 change by attracting funding for a specific project for a Lancashire UAS cluster based on good practice from Aerial Uptake and building on the success of the projects described in Actions 2 and 3. However, this may take the form of policy development during Phase II with the aim of securing funding and longer-term territorial effects from this policy instrument or other emerging funding streams and strategies.

## 4.2 Action 2: Increase the number of businesses in the region bringing new drone technologies and services to market

Based on good practice from Aerial Uptake, in particular the Netherlands case study (SPACE 53), the region secured funding in May 2021 from the EU Structural and Investment Funds Strategy (ESIF) for a new project called the Lancashire Innovation Drone Zone (LIDZ), a key step in the development of a UAS cluster for Lancashire. This complements and builds on Action 3 with the aim of the project to grow the UAS market to strengthen the case for a UAS cluster, by providing specialist drone technology and related research and development support to new and existing small and medium sized enterprises (SMEs) in Lancashire. The project is aiming to work with 200+ businesses.

The European Regional Development Fund's (ERDF) business support programme awarded the University of Central Lancashire £1.8 million (€2m) for this new project - Lancashire Innovation Drone Zone (LIDZ) project.

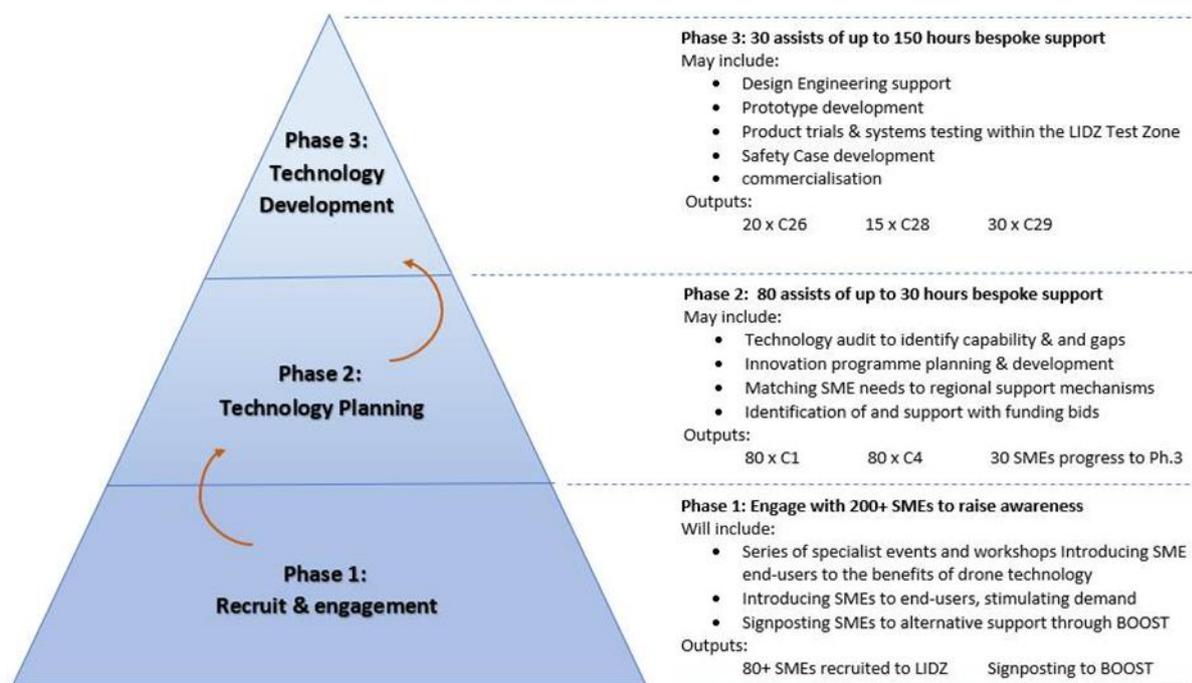
The ERDF project provides the basis for increasing the number of businesses in the region bringing new drone technologies and services to market. The revised Regional Steering Group (Action 1) will support the delivery of the ERDF project and seek opportunities to secure additional funding to increase the level of funded business support for drone related SMEs in the region.

Lessons Learned	Source of the Lesson
Having a physical centre, such as the EIC, as a focal point to engage with businesses and foster innovation.	Enschede case study Regional learning needs (see Action 1 and Regional Needs Analysis) Discussions with other partners
Develop specific projects and activities to promote market uptake.	TF Market insights

### The main activities, aims and target outputs are below:

The client journey for the LIDZ project is outlined below and includes a tiered approach consisting of 3 phases. This approach enables beneficiaries (SMEs) to 'jump on-and-off' at any stage.

UCLan will engage with 200+ SMEs at phase-one, delivered through a series of knowledge exchange events designed to raise awareness of market & innovation opportunities within the sector. Support will consist of a programme of awareness raising events and one-to-one meetings and will take place mainly in the new specialist Drone Command Centre facilities within UCLan Engineering Innovation Centre (EIC).



Key to outputs:

C1 = Number of enterprises receiving support x 80

C4 = Number of enterprises receiving non-financial support x 80

C26 = Number of enterprises cooperating with research entities x20

C28 =Number of enterprises supported to introduce new to the market products x 15

C29 = Number of enterprises supported to introduce new to the firm products x 30

**Output targets summary:**

Activity	Output
Business support, advice and guidance, consultancy and diagnostics mainly through workshops and awareness events at the EIC	Engaging with 200+ SMES 80+ recruited to the project
Consultancy, information, diagnostic advice and guidance to individual businesses – one to one support - as well as financial assistance for investment that results in the production of goods and/or services	80 businesses supported
Consultancy, information, diagnostic advice and guidance to individual businesses – one to one support – but not including any financial support	80 businesses supported

<p>Develop long term collaborations transferring good ideas, research results and skills to enable joint and long term development of innovative new products or services through one to one support eg through formal partnerships with UCLan and other organisations</p>	<p>40 long term collaborations which have a formal cooperation in place/Memorandum of Understanding (MoU). Could cover:</p> <ul style="list-style-type: none"> <li>*research collaborations and free dissemination of research;</li> <li>*joint and long term development of new businesses and services;</li> <li>*Formation of joint ventures and spin-out companies</li> </ul> <p>Outcome could be a unique new drone service offered by a business</p>
<p>One to one assistance to businesses to develop and bring new products or services to the market that are new to them – eg assisting a firm that produces automotive carbon fibre panels to produce carbon fibre drone components</p>	<p>30 businesses bringing new products or services to the market which are new to the business</p>
<p>One to one assistance and support to businesses to develop and bring a <i>unique</i> new product to market including process innovation</p>	<p>15 businesses assisted to introduce a new product to market</p>

<b>Sub actions</b>	<b>Success factors</b>
<p>Identifying potential SME beneficiaries and market opportunities.</p>	<p><i>Work in progress – aim to increase the number of businesses in the region bringing new drone technologies and services to market. Growing the market – supply</i></p> <p>Aim to enlist 80+ SMES to the project and work with 200+ overall</p>
<p>Explore opportunities to secure additional funding from other sources, e.g. UK Research and Innovation (UKRI).</p>	<p><i>Work in progress – aim to secure funding to grow the UAV market identified as a barrier to growth</i></p>
<p>Knowledge exchange events with SMES to raise awareness of market and innovation events within the sector</p>	<p>Work in progress – aim to increase the number of businesses in the region bringing new drone technologies and services to market through increased knowledge – a barrier identified – knowledge – to growth</p>

Technology Planning – including technology audits and gap identification with SMEs	Work in progress – aim to increase the number of businesses in the region bringing new drone technologies and services to market
Technology Development including design engineering support and prototype development	Work in progress – aim to increase the number of businesses in the region bringing new drone technologies and services to market

## Stakeholders engagement in the action

The ERDF project is being delivered by a dedicated team at the University of Central Lancashire and supported by other stakeholders represented on the Regional Steering Group put together for Aerial Uptake as previously described:

### **The University of Central Lancashire (UCLan)**

**NWAA** – the North West aerospace cluster

**BAE Systems** – the largest defence company in the UK.

**Advanced Manufacturing Research Centre North West (AMRC)** - AMRC North West

**Lancashire Local Enterprise Partnership (LEP)** – key stakeholder in facilitating the growth of UAS ecosystem.

**Preston City Council (PCC)** – local government

## Timeframe and cost

LIDZ (ERDF)

Start date	1 Jan 2021
End date	30 Sept 2023
ERDF contribution	£1.1m (€1.3m)
Private Contribution (UCLan)	£0.7m (€0.8m)
Total cost	£1.8m (€2.1m)

## Target Group

The ERDF project works with new and existing high-growth tech businesses and those with opportunities to adopt drone technologies in Lancashire’s relevant priority target sectors:

- Advanced Engineering and Manufacturing including aerospace and automotive
- Energy, Renewables and Low Carbon
- Advanced Chemicals and Polymers
- Food and drink
- Service sector
- Visitor economy
- Creative and digital
- Social enterprise

UCLan has an established track record providing drone support to SMEs from multiple sectors including construction, security, surveying & manufacturing, and the technology sector. Businesses in growth sectors and those with a propensity to innovate and introduce new drone related products and services will have the most to gain from the support available through LIDZ Project.

It is expected that these will be small and medium sized businesses, although some earlier stage micro businesses will have R&D programmes strong enough to reap benefits from additional LIDZ interventions.

In-line with UCLan’s own drive for greater diversity in Engineering and STEM subjects, the project team will take steps to promote participation of female and under-represented groups by taking advantage of its established links with networks such as the ‘Women In Business Network’ and ‘Women in Science Network’. The University also has strong links with the BAME community and will support and promote related activities through the LIDZ project.

## Risk Factors

The main risk factors associated with this action are shown below.

Risks Description	Owner	Probability	Impact	Mitigation
Unable to recruit sufficient SMEs developing products or services related to drones	Project manager	Low	High	Improve marketing of the project and work with relevant agencies, partners and networks to raise awareness and attract suitable SMEs

Businesses not wanting to proceed to through the tiers of support	Project manager	Low	Med	Put in place effective account management and support to overcome barriers to progression
Key staff leave the project	Project Director	Low	High	Ensure that skills required to carry out the project do not all reside in one person.
Impact of Covid-19 in the ability to deliver activities such as workshops, events and flight trials	Project Manager	Medium	High	Ensure activities can be planned around restrictions using virtual technologies and safe working practices

## Goals:

The aim of the project to grow the UAS market to strengthen the case for a UAS cluster for Lancashire, by providing specialist drone technology and related research and development support to new and existing small and medium sized enterprises (SMEs) in Lancashire.

The vision is to build upon existing regional strengths and respond to a major international opportunity to provide the UK with a world-class innovation cluster for the development, test and manufacture of civil unmanned aerial vehicles.

To provide long-term support to drone sector businesses and drone end users in the region by enabling access to one of the best equipped drone research facilities of any university in the UK.

The additional investment allows us to scale up our engagement with companies in the region in order to help increase levels of innovation and create new, high-level jobs for the future.

This funding will place UCLan, Preston and the North West at the very heart of this high-growth industry, enabling us to develop world-class expertise, jobs and economic growth for the region.

## Policy Change

### Type 1 change: implementation of new projects

A policy change type 1 - securing investment for a new project - has been reported to the Lead Partner of the Aerial Uptake project as part of the Semester 4 Partner Report and is subject to Joint Secretariat approval. Based on good practice from project partner Enschede in the Netherlands, the region secured funding in May 2021 from the EU Structural and Investment Funds Strategy (ESIF) for a new project called the Lancashire Innovation Drone Zone (LIDZ) project, a key step in the development of a UAS cluster. This complements and builds on Action 3 with the aim of the project to grow the UAS market to strengthen

the case for a UAS cluster, by providing specialist drone technology and related research and development support to new and existing small and medium sized enterprises (SMEs) in Lancashire.

The European Regional Development Fund's (ERDF) business support programme awarded the University £1.8 million (€2m) to provide specialist drone technology and related research and development support to new and existing small and medium size enterprises across Lancashire.

This is through the 2014-2020 European Structural and Investment Funds (ESIF) Growth Programme, Priority Axis 1: Promoting Research and Innovation.

This investment is evidence of commitment and support for a Lancashire Drone Innovation Zone (Lancashire Cluster) and acknowledgement of the potential and importance of developing an UAV market for Lancashire.

## 4.3. Action 3 - Increase Lancashire Local Authorities' use of drone technologies (both existing and emerging)

UCLan received £1.2m (€1.5m) (capital grant) in August 2020 from the Lancashire Local Enterprise Partnership (LEP) for specialist drone equipment through a Drone Command and Control Centre (DCC) project. This project was an extension to the £30m Engineering Innovation Centre (EIC) project, which received a £10.5m Growth Deal funding contribution in 2016.

The project provides specialist equipment to enable the creation of a Drone Command and Control Centre (DCC) within the EIC, including advanced drone simulation, rapid drone technology prototype and testing capabilities. The project will enable the University of Central Lancashire to expand existing courses and develop as the UK's centre of excellence for drone technology.



*Figure 1 - The Engineering Innovation Centre in Preston, Lancashire*

This project will make a strategic contribution to the development of a wider Drone Innovation Cluster in Lancashire, as identified as a priority within the emerging Lancashire Industrial Strategy (LIS) and is being developed with the support of a range of partners including BAE Systems.

The DCC uses existing staff and expertise to establish a capability to work with industry to fully develop and test civic drone technology, and conduct full-scale technology demonstrators to stimulate new markets, supply chains and high-skilled jobs.

The project supports education and demonstration activities to highlight drone applications and establish the business case for Local Authorities. The case can include the use of drones to deliver efficiency savings and carbon reductions, such as reducing ongoing maintenance costs of the estate through roof surveying, building thermal efficiency surveys and digital twinning

<b>Lessons Learned</b>	<b>Source of the Lesson</b>
Use public sector partners to improve societal acceptance of UAVs.	Enschede case study Regional learning needs identified through the regional needs analysis Discussions with other partners

The main activities that form part of action 3 are outlined in the table below.

<b>Sub actions</b>	<b>Success factors</b>
Demonstrate equipment purchased through Growth Deal to local authority partners	Increased knowledge and awareness of drone technology and benefits to local government
Identify efficiency savings or carbon reduction through drone technology	Work with Local Authorities to identify cost savings (eg reducing costs for ongoing maintenance of estate management; thermal imaging to identify energy loss from buildings; using drones in place of people/physical scaffolding helps with health and safety and reduction in carbon footprint
Identify potential projects with Local Authorities	Work with Local Authorities to identify and secure projects eg roof inspection, thermal monitoring, to increase uptake of drone technology by local government.

## **Stakeholder engagement in the action**

The main stakeholders involved in this action are members of the Regional Steering Group, and in particular UCLan, Preston City Council, Lancashire Local Enterprise Partnership and Lancashire County Council. There will be a need to continue to reach out and engage other Local Authority partners such as Burnley Council in East Lancashire. There are currently 12 district councils, as well as Lancashire County Council and two unitary authorities – Blackburn with Darwen and Blackpool Councils in Lancashire.

## Timeframe and costs

Lancashire Command and Control Centre project (Growth Deal)

Start date	August 2020, March 2021 Facility Open
End date	September 2023 with annual monitoring
Growth Deal contribution	£1.3m
Private Contribution (UCLan)	£.1m (€1.65m)
Total cost	£1.4m (€1.5m)

An additional fund of £140K (€165k) was provided by the university in support of this grant, bringing the total spend available to £1.34M (€1.5m)

## Target Group

Local Authorities and businesses in Lancashire.

## Risk Factors

The main risk factors associated with this action are shown below.

Risks Description	Owner	Probability	Impact	Mitigation
Changes in national and local priorities relating to drone use.	Project Manager	Low	Medium	UCLan to attend DfT and CAA engagement events and regularly review strategic plans to reduce this risk.
Demand from LAs to use the kit is less than expected.	Project Manager	Low	Medium	We have existing relationships through the Civic Drone Centre that can be exploited e.g. current and future NATEP / Interreg projects.
Loss of technical expertise at UCLan	Project Manager	Low	High	Aerospace is an area of considerable strength at the University with plans to invest further.

## Policy change

### **Type 1 change: implementation of new projects**

UCLan applied to the Lancashire Enterprise Partnership for funding for UAV equipment to further develop, stimulate and upskill the UAV business ecosystem in Lancashire.

UCLan has been successful in securing £1.2m grant through the Lancashire Growth Deal for UAV equipment, a first stepping stone towards a Lancashire Drone Innovation Zone. This grant was awarded in August 2020.

The grant will enable UCLan to purchase drone equipment and use it to work with regional UAV businesses and end users to develop their businesses, a key outcome of the Aerial Uptake project in Lancashire, job creation. An additional fund of £140K was provided by the university in support of this grant, bringing the total spend available to £1.34M.

The Growth Deal is £320 million of UK government funding being delivered by the Lancashire Enterprise Partnership to support economic growth in the Lancashire region.

The Growth Deal aims to generate up to 11,000 new jobs, create 3,900 new homes and attract £1.2 billion of additional public and private investment for Lancashire.

Lancashire's Growth Deal programme is fully coordinated with major economic initiatives: the £450m Preston, South Ribble and Lancashire City Deal; the £20m Growing Places Investment Fund; and the Lancashire Advanced Manufacturing and Energy Enterprise Zone Cluster which together are delivering economic growth and prosperity in Lancashire.

# Appendices

## Appendix 1 - UAS PESTLE ASSESSMENT FOR LANCASHIRE

UAS PESTLE assessment		
Political	Economic	Social
<p><b>Driver</b> – promoting UAS uptake and adoption as a response to Covid-19 challenges.</p> <p><b>Driver</b> – close alignment with national strategy documents, such as National Industrial Strategy (2017) and DfT Future Mobility Strategy (2019) (see text below table for details).</p> <p><b>Driver</b> – close alignment with regional priorities and ambitions, such as Lancashire Industrial Strategy Evidence Base (2019) and Lancashire Innovation Plan (2019) (see text below the table for details).</p> <p><b>Driver</b> – public budgetary pressures meaning a greater need for efficiencies and innovation in the public services.</p> <p><b>Opportunity</b> – build upon strategic investments in Lancashire including the EIC, City Deal and Lancashire Enterprise Zone (including the AMRC NW new facility).</p> <p><b>Opportunity</b> – funding routes e.g. Future Flight Challenge (Industrial Strategy Challenge Fund) from UKRI, Brunel Challenge from UK Govt, Lancashire Growth Deal, Transforming Cities Programme from DfT.</p> <p><b>Opportunity</b> – bringing together key players: supply chain</p>	<p><b>Driver</b> – numerous potential economic benefits including:</p> <ul style="list-style-type: none"> <li>• improved productivity</li> <li>• efficiency gains</li> <li>• attracting investment</li> <li>• creating highly skilled jobs</li> <li>• boosting exports by accelerating new technologies to market</li> <li>• managing costs</li> <li>• controlling risks</li> <li>• increasing safety</li> </ul> <p><b>Driver</b> – job creation through changes in productivity, consumer demand and the UAS supply chain. Mainly high skilled jobs to design, build, operate, maintain and regular UAS e.g. entrepreneurs, hardware and software developers, airspace traffic managers etc.</p> <p><b>Driver/Opportunity</b> – UAS use presents opportunities for businesses to diversify their offer and retain employment during the Covid-19 pandemic and lockdown where the sector is facing considerable uncertainty.</p> <p><b>Opportunity</b> – end-to-end system integration from adopting UAS technology into a business (e.g. automation of receiving, analysing, integrating UAS data, upskilling UAS handlers etc).</p> <p><b>Opportunity</b> – the potential to spread these productivity gains over a number of sectors (multi-factor productivity).</p>	<p><b>Driver/Opportunity</b> – health and safety benefits from human being removed from hazardous environments. Reduced human risk when using UAS over traditional technology for activities relating to <b>height, reach and speed</b> e.g. building spraying via UAS instead of humans on scaffolding.</p> <p><b>Opportunity</b> – applying the technology in response to the Covid pandemic e.g. used to spray disinfectant or transport medical supplies, and other global emergencies.</p> <p><b>Opportunity</b> – Covid-19 restrictions are providing greater interest in remote access to services and goods delivery.</p> <p><b>Opportunity</b> – delivery drones can reduce isolation and inequality by increasing access to those who need it the most (e.g. through cheaper and more efficient delivery).</p> <p><b>Barrier</b> – poor British public perception of drones. Less the 31% of British public feel positively about drones<sup>2</sup>.</p> <p><b>Barrier</b> – the perception that the increasing adoption of disruptive technology and increasing automation will make some existing job roles redundant.</p>

<sup>2</sup> <https://www.businesscloud.co.uk/news/brits-perception-of-drones-stopping-uptake-in-uk/>

<p>companies, research expertise and the public sector to take activity forward.</p>	<p><b>Opportunity</b> – PWC report estimates the drone economy could add an extra £42bn to the UK's GDP by 2030.</p> <p><b>Opportunity</b> – fast adoption of UAS technology for businesses operating in sectors where the disruptive potential of UAS is high will avoid losing out to competitors.</p> <p><b>Threat</b> – that the UK falls behind international competitors in UAS uptake and innovation.</p> <p><b>Barrier</b> – market failures to adopt technology including:</p> <ul style="list-style-type: none"> <li>• <b>asymmetric information</b> – many SMEs not being aware of or in the position to understand the applicability of new opportunities from emerging UAS technology.</li> <li>• <b>positive externalities</b> – generated through innovation mean benefits are captured by others outside the business, a disincentive to innovate.</li> <li>• <b>coordination failures</b> – the successful exploitation of innovation often requires complex public/private partnerships which can be difficult.</li> </ul>	<p><b>Barrier</b> – a series of reported drone-related events influencing poor public perception, e.g. the Gatwick drone incident in December 2018, reports of drones being used to carry drugs into prisons, invading citizen's privacy etc<sup>3</sup>. Good news stories are required to counter these negative perceptions and support increased uptake.</p>
Technological	Legal	Environmental
<p><b>Driver</b> – enable Lancashire and the UK to compete in emerging and future markets.</p> <p><b>Threat</b> – need for investment to ensure the UK does not fall behind international competitors in UAS innovation, with implications for uptake.</p> <p><b>Opportunity</b> – advantages of UAS over traditional technology in <b>height</b> (smaller UAS technology being cheaper to</p>	<p><b>Opportunity</b> – the current Air Traffic Management and Unmanned Aircraft Bill will help to legitimise UAS use and reduce the scope for negative uses and associated perception issues</p> <p><b>Barrier</b> – anyone wishing to fly a drone in the UK must pass a theory test to get a flyer ID and must register the drone to get an operator ID.</p>	<p><b>Driver</b> – the UK's ambitions to become a net zero carbon nation by 2050, and the role that UAS can play in meeting this target</p> <p><b>Opportunity</b> – environmental benefits through lower emissions from UAS adoption over traditional technology (e.g. planes, cars, helicopters) for some activities.</p> <p><b>Opportunity</b> – UAS adoption allowing for reduced transport</p>

<sup>3</sup> <https://www.suasnews.com/2019/01/2019-a-pivotal-year-for-the-uk-drone-industry/>

<p>operate than fixed wing and helicopters), <b>reach</b> (more efficient over wide areas) and <b>speed</b> (provided by swift vertical launch capabilities).</p> <p><b>Opportunity</b> – create an environment to apply and commercialise UK Research and Innovation funding, designing and developing UAS and component parts.</p> <p><b>Opportunity</b> – the proposed Lancashire UAV Cluster helps to overcome many of the private sector investment-related market failures.</p> <p><b>Opportunity</b> – building upon existing projects being undertaken in the North West e.g. HP1 Impact Classification System (HP1 Technologies Ltd UCLan and partners), Precision Back-Up Navigation for UAVs (Forsberg Service Ltd, UCLan and partners), Juno (Haydale Composites, NWAA and partners).</p> <p><b>Barrier</b> – lack of SME knowledge of how UAS technology can benefit their operations, or the perception that UAS is only for certain sectors like photography and construction.</p> <p><b>Barrier</b> – lack of finance for companies to invest in UAS adoption, high investment costs.</p> <p><b>Barrier</b> – lack of manufacturing or supply chain expertise. Also, a disconnect between technology developers and the end users or skills and R&amp;D facilities.</p>	<p><b>Barrier</b> – strict regulatory barriers in the UK. Current regulations in the UK from the CAA mean you cannot fly drones<sup>4</sup>:</p> <ul style="list-style-type: none"> <li>• above 120m/400ft</li> <li>• closer than 50m from other people</li> <li>• over people who are crowded together</li> <li>• closer than 150m to residential, commercial and industrial areas</li> <li>• close to airports</li> <li>• out of sight</li> <li>• weighing 20kg or more</li> </ul> <p><b>Barrier</b> – business awareness of and understanding of the issues and regulations (information asymmetries), and how to navigate and overcome them, is low.</p> <p><b>Barrier</b> – requirements to secure CAA approval for new products in the aviation sector, which can be intense, complex and timely. Difficult for businesses to navigate themselves.</p> <p><b>Barrier</b> – business knowledge of Operational Safety Case (OSC) development, which are special permissions granted by the CAA when dispensation from standard regulations is required.</p>	<p>times, reduced congestion, cheaper and more efficient delivery.</p> <p><b>Opportunity</b> – environmental benefits through UAS technology being used to monitor pollution levels.</p>
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<sup>4</sup> <https://register-drones.caa.co.uk/drone-code>

<p><b>Barrier</b> – the specialist equipment and knowledge required for testing, needs dedicated airspace and identified test zones.</p>		
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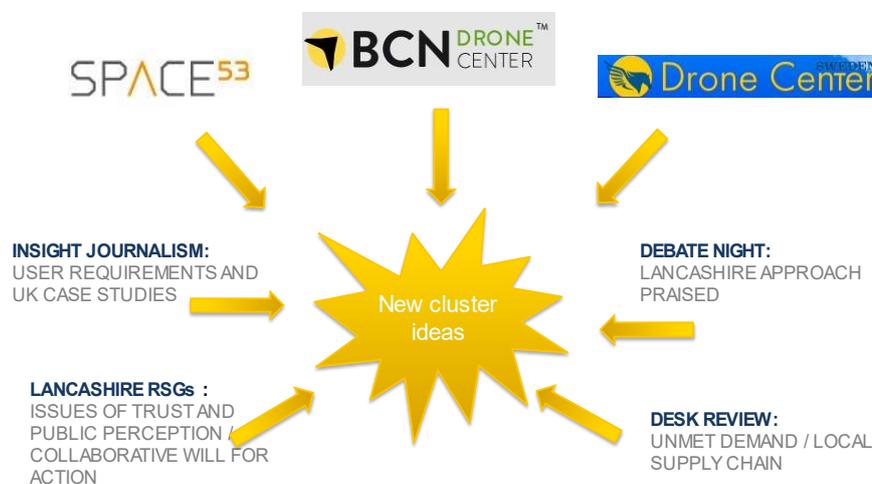
*Table 1: UAS PESTLE Assessment*

## Appendix 2 – lessons learnt

### Good practice(s) and project learnings

#### Case Studies and Visits: interregional learning and ties with the Lancashire Drone Innovation Zone.

## Interregional Learning



2

Partner visits have taken place to Enschede (August 2019) to see the set up and work of SPACE 53 and also the partner visit to Linköping (March 2020) where we also learned about the Sweden Drone Centre. This provided good practice case studies to underpin our own ambitions in Lancashire and demonstrate that this structure is successful and working to develop the UAV sector in a region.

The opportunity to learn from international case study examples of other European clusters enabled us to consider elements of their models to develop our plans in Lancashire, such as the co-location of start-ups on-site at a dedicated test centre.

The Space53 (Enschede) and BCN Drone Centre (Catalan) have demonstrated the benefits of a triple or quadruple helix project involving industry, academia, government and citizens.

Space53 at Technology Base Twente is a former military airfield which has been developed into a high-tech industrial area.

Space53 provides an ecosystem for the safe development, testing and training of unmanned systems on land, in the air and/or in the water.

Space53 facilitates the complete innovation process of unmanned systems by providing access to everything that is needed:

- Technological expertise
- Office space and technical facilities
- Indoor and outdoor testing areas
- Educational and training facilities
- All emergency services
- Possibility to simulate lifelike situations
- Necessary permits that are optimally aligned with the existing and future legislation
- 'Launching customers', such as the Province of Overijssel, Veiligheidsregio Twente and the Municipality of Enschede as living labs to try out smart ideas in real life

The BCN Drone Center is an infrastructure inside an official segregated airspace exclusive for UAVs in Catalan.

- ***Problem addressed:*** lack of facilities to test, develop and evaluate UAVs in Europe.
- ***Solution provided:*** infrastructure inside an official segregated airspace exclusive for UAVs.
- ***Results:*** Civilian drone company with longest trajectory in Europe, almost 20 years in the sector. More than 1000 persons from 85 nationalities have used the center.
- ***TF INNO:*** design, manufacture, develop, test UAS and UAS related products/services in a single place. Collaboration with European projects, universities and administration.
- ***TF MARKET:*** The products, services and the research projects are being used around the globe.
- ***TF SOCIAL:*** contribution to the outreach of drone technology. The 1<sup>st</sup> drone race live broadcasted in Spain was held there in 2016.
- ***Stakeholders and their involvement:*** The members of the drone sector: researchers, drone companies, consultancy and engineering companies, administration and consumers of drone technology.
- ***Challenges:***
  - Location to build the center
  - Regulations (Temporary Segregated Airspace)
  - Lack of investment and the drone regulation in Spain.
  - The awareness of the UAS industry
- ***Lessons learned***
  - Legal issues to obtain Temporary Segregated Airspace

***Good learning points about the*** difficulties to gather the personnel, the resources and the financial funding,

In addition, the softer interregional learning that took place during the visit to RI:SE in Sweden, and the insights around how research and development, and specifically the resources and space-based provision can help harness innovation was an inspiration to Lancashire's own plans.

The interregional learning has haled us to evaluate our own strengths, opportunities and weaknesses in this space and has greatly informed the development of the Lancashire cluster plans).

*An important best practice and learning point is about "the benefits of setting out a CLEAR VISION for the cluster - and what it can do for different stakeholders". (I think we have done this pretty well in the Business Case). That VISION is really important as it enables the cluster stakeholders to come together and have a common sense of North, and it helps us quickly identify what things can help us achieve the vision, or not.*

### **TF Promoting Market Uptake**

***Insight Journalism:*** the two pieces of 'insight journalism' that were produced in Lancashire demonstrated a range of data that would support the aims and ambitions of a Drone Innovation Zone.

These included:

- *R&D into innovation:* How research and development facilities in other parts of the UK have had a direct and tangible impact on UAV-focussed SMEs and start-ups. Lancashire's SME ecosystem (demonstrated through the Market desk review – would support enhanced R&D facilities. This would help to create
  - 'next generation' UAV use cases that were unencumbered by limits such as: not flying beyond line of sight, which is turn was seen as final for future market exploitation, and the safe operation of 'drone swarms' that would open up possibilities for enhanced use cases. During both pieces of journalism, there were areas around 'technological readiness that the regional steering group could focus on over the next 12 months.
- *Collaboration:* the Insight Journalism demonstrated both the advantages of collaborative work for the UAV sector and the demand within Lancashire for a more coordinated innovation ecosystem
- *SMEs and desire to scale:* SMEs who were interviewed, and representatives from UCLan who are working to support UAV SMEs, demonstrated a fundamental desire to scale operations and to create new skills that would allow them, and therefore the sector, to expand.
- *Funding:* the journalism demonstrated that a core requirement for SMEs both within and beyond the Lancashire region was the availability of dedicated innovation and development funding. This is one potential major area for the Steering Group to facilitate over the course of Phase 2

Links to the media for further reference are:

Aerial Uptake Live: [Podcast](#)

Drone market opportunities in the UK and Lancashire: [film](#)

## **TF: Improving Societal Acceptance**

### **Debate Night UK – main points learned**

Participants in the debate night provided the following insights around public perceptions and societal acceptance:

- There are a wide range of social good activities that strike a chord with members of the public. Panelists discussed search and rescue, transportation of vaccines and other medical supplies, mine clearance, flood monitoring
- Despite positive potential, the panel agreed there were fundamental concerns from the public on how drones are used
- Trust and tech safety are key drivers for this.

### *Potential actions*

- education of the public around drones could have a positive impact
- transparent operations: the public could find out what drones were doing
- Local government could create positive impact through the creation of enterprise zones, business clusters – or similar – for UAVs and to demonstrate their potential
- The future holds more automation and higher product standards and capabilities – such as flying beyond line of sight and increasing use of AI. They will increasingly be used as tools.

## **Insight Journalism**

The Insight Journalism process also assisted with the identification of social acceptance as a key issue, particularly from the perspective of UAV operators. Further to this, was a sense of the importance of aerospace as part of Lancashire's heritage, and how this can be leveraged in the implementation of any UAV-focussed development plan.

## **Regional Needs Analysis**

### **The Citizen**

Public confidence in and acceptance of drones is seen as key to the uptake and development of the UAV sector across all of the quadruple helix members. The Lancashire Regional Needs Analysis and those of the partner regions survey show in the majority that the general attitude to drones from the public is very positive on the whole.

## **Possibilities and Obstacles to societal acceptance**

- Opportunity to harness positivity to drones by the public.
- To improve societal acceptance of UAS technologies there is a need to address the ethical, legal and social concerns, raising public demand for new solutions and due consideration of potential social impacts and benefits
- Main obstacle is lack of resources and “ownership” of the UAV sector. There is no single point of contact to increase knowledge in the region, address legal and safety concerns and promote the industry.
- Who is responsible for policing drones in Preston/Lancashire? One place or many places? Where can the public go for information and reassurance?
- Resources and limitations of project – there are opportunities for communities to benefit from drone technology, but until all aspects of the industry are synergized, public acceptance will take time – e.g. regulation, safety, job opportunities, clear distinction communicated between hobbyists, military and commercial uses.

## **Comparative Insight / Common themes from all the Regions**

- There is a positive attitude to drones across all regions in the project
- Citizens are more likely to be curious or interested in drones than nervous
- Common theme is lack of knowledge of drones and the drones sector in particular, who is flying drones in their area and for what purpose

## **The Industry**

The main finding was that Lancashire should be driving the drone sector: it is well placed to do this with a visible supply chain, an active research hub and with international corporations easily within geographical reach.

## **Possibilities and Obstacles**

- Lancashire is already viewed by the industry as enabling and supportive with the potential to be one of the most important regions in the UK (and Europe) for the development and testing of UAVs as part of a wider economic development cluster.
- Opportunity to build on that knowledge, resource and positivity to be a leader in the UAV industry
- Opportunity for more collaboration between regional factors

## **Obstacles:**

- Perception needs to be addressed. Drones are perceived as ‘big boy’s toys’: how accessible are drone technologies? Is there a reputation or reputation around UAVs that prevents people and organisations from considering using them?
- Does public perception translate into the UK being too risk averse? Is there a resistance to UAVs in the UK, and a failure to seize upon opportunities? This is fired by public perception, and the limit to which government and industry will consider investing in drones because of the negative connotations
- There is a lack of knowledge about the benefits that drones can offer to businesses

- No test beds/pathfinder projects currently in the region or major industry driving the sector
- Funding is seen as obstacle - Development costs of technology without an obvious marketplace, or growing marketplace can limit innovation, specifically from research to commercialisation
- Regulations – regulatory issues are seen as curbing innovation and drone development, for example, where there are limitations on flying parameters
- There is a perceived lack of public administration involvement
- Funding is a barrier to collaboration: SMEs keen to collaborate and drive innovation, but are limited by availability of funding, a tendency to focus on short-term development and wins, limited government (national and local support and regulatory barriers)

### **Recommendations for improvement:**

- Enhanced collaboration between regional actors around government (policymakers and funders), industry (SMEs, large and global enterprises) and research institutions
- Collaboration avoids duplication. This is an important point as duplication is wasteful and inefficient. In this way, collaboration around UAV tech can increase efficiency and competitiveness,
- Joined-up policymaking that would cater for research and innovation, improving skills and creating conducive or competitive business environments
- Better connections with non-UAV firms or supply chains to demonstrate the potential benefits drones can offer across a number of use cases. For example, there are
- industrial benefits as well as public sector/publicly visible uses
- Build upon existing regional strengths and provide the UK with a world-class innovation cluster for the development test and manufacture of civil Unmanned Aerial
- Vehicles. Such a centre would support the development of a major new economic development cluster in the North of England capable of retaining and creating the high skills jobs of the future
- Back a local and national response and consider how IP can be generated and more importantly, exploited for the benefit of the regional economy
- Invest in research and development and create a clear funding strategy and an innovation culture are seen as key elements for the development of a growing and sustainable UAV marketplace.
- Stimulating and investing in the sector is a key requirement
- Develop cross-sector collaboration and share risks/costs. In spreading the risk, it will allow for more stakeholders to engage in research, innovation and exploitation
- Develop materials on how UK businesses can generate revenue from drones
- Creative incentives to be early adopters and increase transparency between academia and industry
- At a local level, UCLan and PCC can continue to influence key policy continued partnership with the Lancashire Enterprise Partnership to foster more public administration involvement

### **Comparative Insight/Common Themes from the Regions**

- Public perception and acceptance are seen as key to developing drones technology across all regions apart from Podkarpackie (Poland)
- All regions cite regulatory issues as a barrier to innovation and growth in the drones sector

- Lack of investment is a common theme although to a lesser extent in Overijssel (Netherlands) and Cataluna (Spain)
- The conditions for conducting drone business are perceived at least as good as other comparable regions across the regions apart from Cataluna and Podkarpackie
- Lancashire has the second highest confidence rate across the regions

### **Public Administration**

Difficult to draw robust conclusions as low response rate.

### **Possibilities and Obstacles:**

The main obstacles are lack of knowledge of the industry, benefits of drone usage and its potential as a catalyst for economic growth.

- At a local level, UCLan and PCC have the opportunity to strengthen partnership with the Lancashire Enterprise Partnership - to both educate to increase public administration involvement and to influence key policy instruments such as the Local Industrial Strategy and other long-term city plans and strategies
- There is potential for more skilled local jobs and economic growth – main obstacle
- funding
- Possibility of exploring a one stop place for regulation or advice – where does that sit?

### **Recommendations for improvement**

- Enhanced collaboration between regional actors around government (policymakers and funders), industry (SMEs, large and global enterprises) and research institutions
- At a local level, UCLan and PCC can continue to lobby the Lancashire Enterprise Partnership on the benefits to the local and regional economy of driving forward the drone sector
- More research and market intelligence are needed at a local and regional level to support national information to demonstrate potential of the UAV sector creating jobs and adding GVA to Lancashire

### **Comparative Insight/Common Themes from the Regions**

- There is greater usage or knowledge of usage of drones in public administration in the Netherlands and Spain with Overijssel, Cataluna and Podkarpackie seen as early adopters
- Lancashire and Cataluna are the only regions with a dedicated economic development function (directly/indirectly for drones)
- There are only two regions in the project that has a regional programme for the fostering of UAS Innovations in the Region.

## **Academia**

Difficult to draw robust conclusions as low response rate.

### **Possibilities and Obstacles**

- Universities can specialise in drone related activities in order to support uptake in industry. While many universities are active in the field of aerospace engineering, few focus upon drones as their core strength.
- Investment in drone research can create good opportunities to transfer knowledge to the industrial sector and other key stakeholders.
- University facilities can also be used to support the perceived lack of testing facilities.
- Obstacles include regulatory limitations on flight in built up areas – typically there is high concentration of people and buildings on a campus that limits or prevents flying activities.
- There are opportunities to utilise existing university equipment, expertise and facilities to support the drone sector
- Universities also prioritise teaching and research over business support activities

### **Recommendations for improvement**

- Dedicated funding programmes that are interdisciplinary are seen as key to increase the uptake of research in UAS and specially to facilitate commercialisation of research/technology.
- Establish regional stakeholder groups to drive forward the drone sector and raise awareness of key strengths and opportunities.

Continue to use existing groups such as the Lancashire Innovation Board to support the cluster development by co-ordinating and lobbying at pan northern and national levels.

- Utilise the universities assets to fully support the drone sector.
- Alignment of research strategies with national priority areas such as ‘Future of Mobility’ and ‘AI’ will help to support the drone sector.

### **Comparative Insight/Common Themes from the Regions**

- Lack of Funding for research in the area of UAS is a common theme apart from in Overijssel.
- Commercialisation of research is supported from in Overijssel and Cataluna
- The above two regions have assigned test bed areas which facilities commercialization of research.

## **Regional Stakeholder Groups**

Key learning points and insights from our Regional Stakeholders:

### **TF: Societal**

- Public good use cases, and the better communication of them can shift public opinion. If there are both safety benefits, of use and safety assurance for use, this could have tangible benefit.
- UAVs and UAV development create jobs. Although driven by market and innovation themes, the net result of job creation and economic development will also resonate across societal acceptance.
- Create a sense of regional and national pride in the technology: we do this well, we excel. This could act as a motivation for a shift in public opinion, and also support market and innovation work. Key technology demonstrator programmes can be created to support this goal.
- Are UAVs greener? Do they contribute positively to the climate emergency? Environmental acceptance of UAV technologies could offer an environmental advantage over alternatives. Amid the current climate emergency, this potential societal benefit could add a further stimulus for a more positive public view.
- Many of these factors will require a fundamental PR strategy and sustained intervention to change the nature of debate but acknowledging the real-world concerns of the public and industry.

### **TF Market**

Aerial Uptake accentuates a 'quadruple helix' approach to innovation; asking if improving the relationship and interactions between government, industry, academia and society around a specific issue, innovation can be catalysed, and more benefits achieved.

- Enhanced collaboration needed between regional actors around government (policymakers and funders), industry (SMEs, large and global enterprises) and research institutions.
- Collaboration avoids duplication. This is an important point as duplication is wasteful and inefficient. In this way, collaboration around UAV tech can increase efficiency and competitiveness,
- Joined-up policymaking that would cater for research and innovation, improving skills and creating conducive or competitive business environments
- Better connections with non-UAV firms or supply chains to demonstrate the potential benefits drones can offer across a number of use cases. For example, there are industrial benefits as well as public sector/publicly visible uses
- SMEs keen to collaborate and drive innovation, but limited by availability of funding, a tendency to focus on short-term development and wins, limited government (national and local) support and regulatory barriers.

- Tensions and potential around academic research practice and commercial interests
- The exit of the UK from the UK – how feasible a single marketplace and level playing field might be

## **TF Innovation**

innovation of technology and adoption focussed on current barriers and potential solutions.

Barriers:

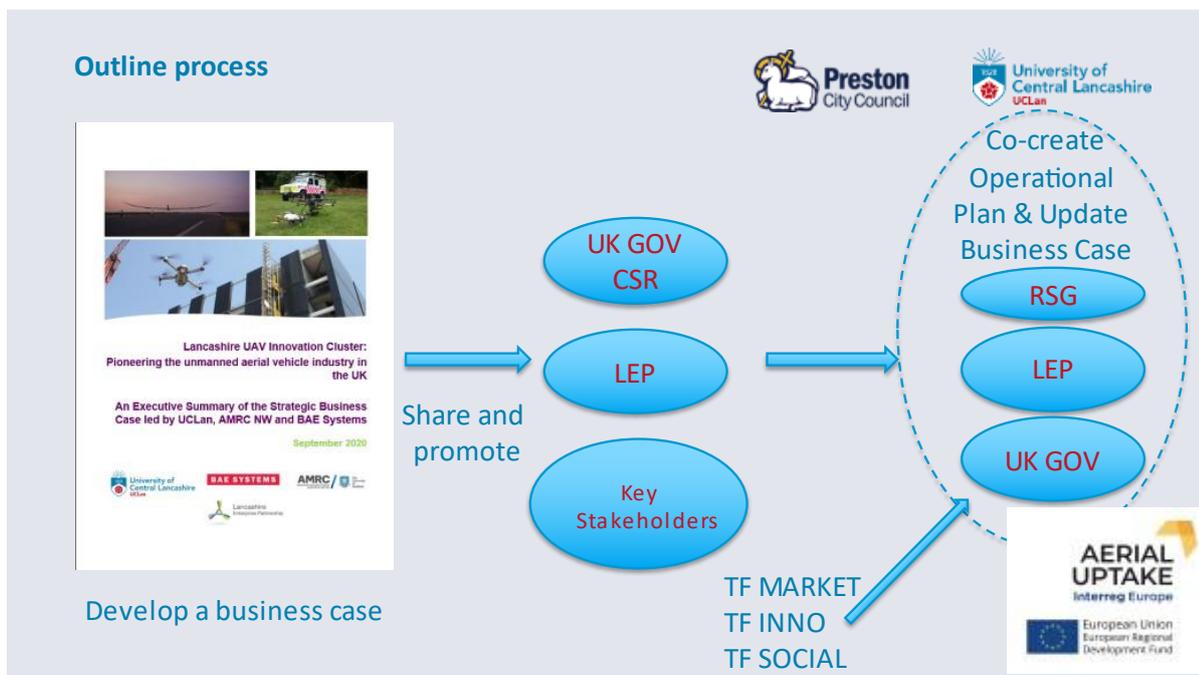
- Is there a degree of risk aversion amidst society, government, regulators and research institutes? If so, a better understanding is required of what is behind this risk aversion, and how risks might be mitigated
- Drones are perceived as big boy's toys: how accessible are drone technologies? Is there a reputation or reputation around UAVs that prevents people and organisations from considering using them?
- A resistance to UAVs in the UK, and a failure to seize upon opportunities. This is fired by public perception, and the limit to which government and industry will consider investing in drones because of the negative connotations.
- Development costs of technology without an obvious marketplace, or growing marketplace can limit innovation, specifically from research to commercialisation.

Solution:

- Back a local and national response, and consider how IP can be generated and, more importantly, exploited for the benefit of the regional economy.
- Invest in research and development and create a clear funding strategy and an innovation culture are key elements for the development of a growing and sustainable UAV marketplace.
- Stimulating and investing in the sector is a key requirement.
- Develop cross-sector collaboration and share risks/costs. In spreading the risk, it will allow for more stakeholders to engage in research, innovation and exploitation.
- Develop materials on how UK businesses can generate revenue from drones
- Creative incentives to be early adopters and increase transparency between academia and industry
- At a local level, UCLan and PCC can continue to influence key policy instruments and continued collaboration with the Lancashire Enterprise Partnership.

Appendix 3

## The Creation of the Lancashire UAV Innovation Cluster



And to achieve this: our ambitions not necessarily within lifetime of assessment period

- Create a sub-RSG to specifically take forward Drone Zone Cluster using evidence from AT interregional learning, case studies and TFs work
- Consider R&D opportunities to consider safety, supply chain support, technology development
- Continue to develop and help grow drone sector through securing additional funding
- Evidence base, roadmap, plan cluster proposal, Quadruple Helix (mini RSGs)
- Will continue to demonstrate viability and potential for jobs and growth with local actors.
- Secure additional funding/projects to help realise ambition of a Lancashire UAV Cluster
- The Cluster Business Case has informed the University's response to the ongoing evidence base review of the regional economy.
- The evidence base in Lancashire is under review to support regional strategy development and seeks to understand the impacts of recent changes such as COVID 19 and Brexit on the local economy.

**The Lancashire UAV Innovation Cluster will combine the unique testing environment in Lancashire with a strong business ecosystem to accelerate the UK's unmanned aerial vehicle industry.**

We aim to achieve the creation of the Lancashire UAV Innovation Cluster by first establishing an initial

Innovation Test Zone at BAE Systems Warton encompassing the following set of actions and activities. The Innovation Test Zone will be a globally significant demonstrator and will rapidly drive progress in drone use, enabling industry and the public sector to fully exploit the opportunities that drones can bring.

**Phase 1** – Establish Test Centre at Warton, including ‘on the ground facilities’ at the Engineering Innovation Centre in Preston

- provide a flexible physical and data infrastructure for industry to develop UAV technologies for the global market
- provide an environment for testing new UAV Air Traffic Management Systems for the benefit of the UK
- provide an environment for industry to develop beyond visual line of sight (BVLOS) technologies, while maintaining a high level of safety
- provide an environment which can be utilised in the future for testing of personal transportation UAVs
- accelerate time to market for new UAV innovations and use-cases and enable public engagement through the creation of safe drone flying zones.
- create a development environment for real-life demonstration and evaluation of UAV technologies

The initial test zone will focus on establishing safe flying areas to overcome technical, operational and commercial barriers and include: -

**Optimising Warton Aerodrome** - For UAV testing through investment in specialist equipment and processes.

**Infrastructure for Testing** - To have everything a developer might need when testing: Ground Control Station, Portable Mechanical and electronics lab, training and meeting rooms. Establishment of laboratories in which the thrust, environment, and other conditions of actual UAV flight models can be simulated to de-risk flying activities. Although some capability exists it is currently geared to fast jets and conventional aircraft and not optimised for UAVs.

**Safe Airspace Zones** - Create managed airspace zone for evaluation of UAV and drone technologies with approved safety cases at Warton. The zone will be enhanced with infrastructure to enable reliable communications and monitoring of UAVs and provide a fast route to flying legally and safely.

**Sensing Test Areas** - We will provide enhanced precision positioning systems enabling UAV operators to verify the real spatial resolution of their sensors. Precision navigation (RTK & d-GPS coverage) will be added and high precision ground control points, effective resolution panels and radiometric resolution targets to create a rich test environment.

**UAV Testing & Certification** - Evaluate, test and validate industry prototypes and projects before releasing them to market. Speed up the certification process through specialist support. Establishment of a safety system to allow comprehensive monitoring and safety management regarding all aspects of UAV flight testing.

**Customer Demonstrations** – Our experience over the latest eight years has identified a need for a place for SMEs and others to perform flight trials for their technology and demonstrate flights and presentations to their clients. We already have a strong network of SMEs and other partner through our work on the Civic Drone Centre and BAE Systems’ supply chain.

**Specialised Equipment** - UAVs and sensors to enhance technology developer trials and carry their payloads.

## **Phase 2** - Establish a UAV Incubation Hub and Cluster at Warton Enterprise Zone

Fully establish the test zone and engage the engineering and manufacturing base

We will promote the growth and development of the Cluster through:

- Helping SMEs develop new products by connecting them with other companies and endusers and providing the facilities and access to the expertise needed to mature their technologies.
- Knowledge sharing between research institutions, companies and private and public user organisations – creating opportunities to transform research into applications through collaboration
- Business-2-Business matchmaking
- Making relevant networking opportunities available by hosting theme-conferences
- Provision of specialised training at the EIC – drone operations and technology.
- Manufacturing Support - Utilising expertise at UCLan and the wider region to support developers with the manufacture of prototypes and products.

The Cluster will establish a safe flying area to overcome technical, operational and commercial barriers experienced by industry during the development of UAVs.

The Cluster will provide an environment for industry innovators to engage with end-users, the government and the regulator at early stages to jointly explore mobility solutions. This increased engagement will serve to both maximise understanding of the current and future regulatory environment, as well as creating an opening for suggested adaptations to regulations where appropriate.

The flying zone will be a 3-D environment catalysing new UAV products for transportation for services, goods and people. The drone-enabled delivery of data services, goods and later, personal transportation will assist in optimising efficiency savings in private and public sectors, improving their capabilities and their ability to carry out high-risk activities in a safer way.

The overall cluster will include a set of complementary safe drone test areas with the infrastructure to create a controlled area to enable innovative drone technologies to be safely developed, evaluated and deployed.

Specifically, the Cluster will include: -

- Infrastructure to enable unmanned air traffic management and reliable communications.
- A CAA approved “sandbox” environment for drone-related outputs from programmes such as the ‘Future Flight Programme’ to be evaluated.
- A Mission Control Centre for monitoring and evaluating real-time drone operations (located within the Engineering Innovation Centre in Preston).
- A ‘supplier interface’ to facilitate the establishment of the Cluster (e.g. Unmanned Traffic Management providers) that will shift to directly supporting users of the Cluster once operational.

The establishment of the test area in Lancashire creates a further opportunity for the advanced manufacturing sector in the region for high-value design, manufacture and test of larger UAV platforms. There is currently a very limited number of suppliers worldwide (mainly China, USA and Israel) despite a growing demand for these platforms to be sourced from within the UK from endusers, such as the emergency services and MoD. The UK can play a lead role in these export markets and the Cluster can facilitate securing this space as a sovereign, advanced manufacturing capabilities for UAVs.

Projects	Value £m	Status	Source
<b>Existing UCLan projects (2016 to present)</b>			
Various collaborative UAV projects	£1m	In progress	Various
<b>Current submitted bids and proposals</b>			
Lancashire UAV's Innovation Cluster Lancashire Growth Deal (EIC extension project – capital grant)	1.5	Awaiting allocation of funds.	Growth Deal (LCC)
Transforming Cities Programme (TCF) - simulation and modelling within EIC – includes potential drone demonstrations.	3.1	TCF announcement has been made. Awaiting local decision.	DfT.
<b>Further Opportunities</b>			
Future Flight Challenge (Industrial Strategy Challenge Fund)	Share of up to £30m grant for competition (up to 6 programmes £5-6M each)	Funded to form consortia for 1 <sup>st</sup> stage bid. Consortia being formed for Ph2 bid	UKRI
Brunel Challenge	Share of initial £70m (out of ~£360m for the whole project)	Under finalising discussions with BEIS/UKRI/IUK	UK Gov
Other Government funding linked to the Industrial Strategy to establish the infrastructure required for the Test Centre, Incubator and Cluster. Capital infrastructure	£25m	Proposition linked to the Lancashire LIS	UK Gov

No	Description	Probability	Mitigation
1	Difficulties securing skilled resource to deliver the projects	Low	Wider advertising, use of social media to promote opportunities. Utilising skills of retired engineers and SMEs to deliver items of technical work.

2	Size of the current core team is not adequate to realise the immediate opportunities set out.	Med	Ensure the business case is reviewed in a timely fashion and investment decisions are implemented.
3	Retention of skilled resource to focus on project work	Low	Ensure fixed-term contracts are for at least two years. Ensure staff development for RAs is in place. Ensure workload models for staff are robust.
4	Availability of space within EIC / elsewhere on campus to create hubs and necessary specialist facilities for the project work	Med	Dedicated space is required for TCF work – potential room identified. Some equipment can be added to the Flight Sim Suite. Possible repurposing of a general-purpose room.
5	Low engagement from SMEs on projects	Med	Promote the support and opportunities via social media, and at seminars and workshops across the UK. Improve links with DfT and pathfinder programmes to raise awareness.
6	Regulatory barriers preventing the establishment of zones	Med	Early dialogue with the CAA's innovation sandbox to provide feedback on proposals

## Goals of the action

The vision is to build upon existing regional strengths and respond to a major international opportunity to provide the UK with a world-class innovation cluster for the development, test and manufacture of civil unmanned aerial vehicles.

### *Context:*

Growth in the international drone market

Lancashire 4<sup>th</sup> largest aerospace cluster in the world, largest in the UK

Lancashire Industrial Strategy

Local TCF projects

Future Mobility/ Industrial Strategy DfT

Future Mobility Strategy

Need for new sectors to stimulate UK economic development post-virus

“By 2030 entirely new aviation markets will emerge exploiting electrification urban and sub-regional airspace” (ATI Accelerating Ambitions 2019). Large core to these emerging markets (UCLan).

### *Issues:*

Safety concerns over urban drone use

Need for national testbeds for UAV technology

Boosting and growing the emerging UAV sector in the UK Low TRL technology and IP needs maturing and exploiting

## Input:

Funding to implement the test centre and air traffic management infrastructure  
 Funding to support SMEs to conduct technology trials and evaluations.  
 Staff to support research, manage trials and work with stakeholders.  
 SMEs to develop and trial their technology.  
 End-users to set requirements and support technology evaluation exercises.  
 Regulators to review safety cases.

## Output:

Safe to fly drone technology for urban use cases.  
 Evidence of public funding cost saving through the use of drones in several u  
 Areas of regular drone activity, transparent and safe.  
 Productivity increases in large scale city regeneration transport projects. A  
 new UK capability for drone technology evaluation New methods of  
 generating and sharing data, transporting goods and ultima Increased public  
 awareness and acceptance of civic drone technology.

## Outcomes:

### *Short term*

Kick start innovation and technology to meet end-user requirements

## Medium-term:

Clustering effect of businesses around the zone

## Impact:

### *Long Term*

Provide the UK with sovereign capability in the manufacture of large drone pl  
 Keep the UK's aerospace R&T ecosystem globally competitive  
 World-leading technologies for civic drone use in data, goods and people. Safe  
 drone technology and safety cases that have accelerated drone use I effect on  
 economic growth.  
 UK IP protected and exploited.  
 Growth in participating SMEs, in terms of income and jobs created.