

# **DISC at Westcott**

## **Satellite Applications Catapult**

**Full Business Case | September 2021**

## Executive Summary

**Space is both a major economic opportunity and part of our critical national infrastructure. The UK must retain and grow its influence in this international arena if it is to control its own destiny**

As a country, we have an ambition to secure a 10% share of the global space market by 2030. Conservatively, this represents an increase of £26bn per annum for the domestic space economy. Such ambition requires a national response to develop sovereign supply-chain capability at sufficient scale to compete effectively on the international stage.

Within this context, our ability to design, develop and manufacture launch and propulsion systems, satellites, and payloads, as well as applications, products, and services for real-world markets is critical. To achieve this goal, the UK must address two prime causes of coordination failure: i) poor availability of specialist equipment, and ii) insufficient access to skilled labour.

### COORDINATION FAILURE

#### Poor availability of specialist equipment

Many companies find it difficult to justify the risk of investment in specialist equipment for the design, build, test, and demonstration of new concepts during the early phase of product and service development. Not surprisingly this is limiting ambition and opportunity. The equipment needed is often prohibitively expensive, with some items costing more than a million pounds. In this environment, demand is high, but availability and access to equipment is poor. Even the largest more established companies and institutions struggle for sufficient funds to make the required level of investment ahead of product demonstration.

#### Limited access to a skilled workforce

New products and services depend on having suitably skilled people to produce them. Without access to the right skills, in sufficient numbers, at the right time, scale-up opportunities are constrained or lost to overseas competition. We need to create the environment for local talent to have access to the diverse range of jobs and skilled learning opportunities that the space sector provides.

### PROPOSED MARKET INTERVENTION

The Satellite Applications Catapult's **Disruptive Innovation for Space Centre (DISC)** addresses these issues as follows:

- **Open Access to Specialist Equipment:** DISC provides a neutral, trusted environment for industry to access equipment on a rental basis to rapidly develop, prototype and demonstrate design concepts for the commercial market
- **Open Access to Skills:** DISC incorporates a Skills Academy to support supply-chain development, building capacity and resilience in readiness for commercialisation. It is aimed at supporting Post-16 T Level and apprenticeships, career changes, reskilling, and upskilling those already working in the sector.

#### **Definition: DISC encompasses:**



*The 'R&D' facilities for industry to innovate, design, manufacture and prototype new products and services*



*The 'Skills Academy' that provides development and learning opportunities (e.g., T Levels, Apprenticeships, and Continuing Professional Development (CPD)).*

### POSITIVE EXTERNALITIES

Wider economic benefits are unlocked through utilisation of the DISC collaborative environment enabling products and service prototypes to be integrated into supply-chains that extend beyond Westcott to other parts of the UK. Also, delivering training to individuals brings value to the sector and the economy that an individual firm is not able to capture.

### IMMEDIATE ASK

This Business Case, as part of the Buckinghamshire County Deal, requests a £30m investment to establish the first large-scale DISC capability. Located at Westcott, the home of rocket propulsion testing, this facility will be a blueprint for further DISC deployment across the UK, supporting two important Government initiatives, Build Back Better and Levelling-up. The Westcott DISC is based on the successful smaller-scale prototype at Harwell, Oxfordshire, which is oversubscribed. Public funding

is essential to establish DISC as an impartial environment within which companies can operate with confidence, a critical factor to achieving the UK Space sector's growth objectives.

The DISC at Westcott will provide industry with the entry point to the rapidly expanding space market, anchoring economic activity in the UK, and creating the means to develop and apply novel launch, propulsion, and satellite technologies. Utilising the Catapult's network, prototypes developed at DISC will have national supply-chain reach, bringing further growth opportunities to other parts of the UK.

We will invest the £30m public sector funding to procure, install and commission specialist equipment within a purpose-built, commercially sponsored DISC facility. The proposal delivers an **NPV of £387m and a BCR of 4.38:1**. The equipment within DISC will be available to users for product and service prototyping, and for skills development being offered within the DISC's fully integrated Skills Academy.

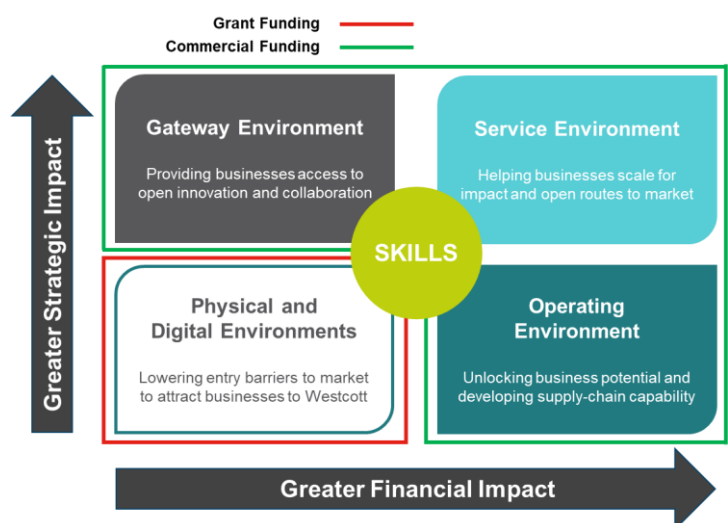
## A CATALYST FOR GROWTH

The case for DISC is informed by the extensive and continual engagement of the Satellite Applications Catapult with the wider Space industry and the end-users of Space sector capability over the past decade. This remit forms part of Catapult's underlying mission to develop and promote the UK Space sector.

The Grant request will establish the core neutral ethos of DISC and unlock commercial funding to develop and operate the DISC multi-layered collaborative environment that will set it apart from other national innovation facilities. As illustrated here, the £30m grant fund will be used to establish the Physical and Digital environment, with commercial funding being used for the Gateway, Service and Operating environments, and skills provision.

Delivering this high-performance environment will allow companies to maximise their growth potential by helping to close out supply-chain capability gaps, maintain tighter control over IP, and open new routes to market. The commercial value of this approach is

recognised within the financial case of this document, while the return on investment captured by the economic case reflects the catalytic impact DISC will have on the wider UK Space sector.



During the Grant funded phase, the Satellite Applications Catapult will form an Enterprise Alliance (EA) with Industry. This Enterprise Alliance will be commercially sponsored to provide private match funding to maintain the Physical and Digital Environment, while at the same time developing the Operating, Gateway and Service environments of DISC. The EA will also be responsible for delivering the skills provision through the integrated Skills Academy. This will ensure the Blueprint established by this project is scalable and repeatable across other parts of the UK. The Enterprise Alliance construct is described within Section 5, Management Case, of this document.

The DISC project is being proposed at a time when international focus is on the commercialisation of Low Earth Orbit space. DISC makes this opportunity immediately accessible. Adoption of this project will position Westcott at the heart of the UK Space sector agenda for growth as outlined within the Buckinghamshire LEP strategic economic plan and Local Industrial Strategy. It will also showcase the Government's County Deal, in addition to other national Government initiatives.



# Buckinghamshire Local Enterprise Partnership

## Business Case

<b>Project Name</b>	<b>DISC @ Westcott</b>
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About the Applicant	
<b>Name of the lead organisation (applicant)</b>	Satellite Applications Catapult
<b>Name of the project manager / main contact</b>	Martin Smye-Rumsby, Westcott Area Manager
<b>Contact number</b>	01235 428300
<b>Contact email</b>	martin.smyerumsby@sa.catapult.org.uk
<b>Senior Responsible Owner</b>	Alan Cox, CCO

About the Project	
<b>Location of the project</b>	Westcott Space Innovation Business Park, Westcott Space Cluster, Westcott Venture Park
<b>Postcode</b>	HP18 0XB
<b>Project start date</b>	T+0 month    October 2021
<b>Project completion date</b>	T+24 month    October 2023^    Building Complete T+35 month    September 2024^    Full Operating Capability
<b>Project longstop date</b>	T+41 month    March 2025^
<b>Total project capital cost</b>	£40,000,000
<b>Total BLEP loan funding contribution requested</b>	£0
<b>Total BLEP <i>grant</i> funding contribution requested</b>	£30,000,000
<b>CBR and NPV</b>	4.38:1 CBR and £387m NPV
<b>Are you seeking to apply for development costs as part of your application?</b>	No <i>If 'yes', please state here the amount requested and complete Section C– Development Costs. Eligibility criteria apply</i>
<b>Current gateway stage</b>	Full Business Case (FBC)

^subject to receiving formal intention to proceed from Buckinghamshire LEP.

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## Appendices

No.	Description	FBC	Reference No
1.	Critical Success Factors of the project	✓	DISC.A01.01
2.	Longlist/Shortlist of project options	✓	DISC.A02.01
3.	Cost Benefit comparison between options	✓	DISC.A03.01
4.	Forecast project outputs and outcomes	✓	DISC.A04.01
5.	Project funding and revenue profile	✓	DISC.A05.01
6.	Risk Register	✓	DISC.A06.01
7.	Industry Case Studies	✓	DISC.A07.01
8	Catapult Space Strategy	✓	DISC.A08.01
9.	Project Logic Model	✓	DISC.A09.01
10	Stakeholder Map	✓	DISC.A10.01
11	Skills Overivew	✓	DISC.A11.01
12.	DISC Master Programme	✓	DISC.A12.01

All appendices are provided as supporting documents to this Full Business Case.



## B. Project Overview

### B.1 Summary of the Project (300 words max)

*Be specific about what the project will do and achieve (who, what, where, how, when).*

The Westcott-based **Disruptive Innovation for Space Capability (DISC)** requires £30m of Capital Grant funding to procure, install, and commission high-tech specialist equipment for use by the space sector and for training purposes within a purpose-built, privately funded £10m building. The service environment, created by the Enterprise Alliance, will provide £20m of additional match-funding: £10m over a 10-year period delivered through partner investment in DISC operations and (£10m) within a time-span of 15-years from doors opening from revenue generation derived from DISC users. The 6,000sqm DISC will be fully operational by September 2024. This assumes a formal intention to proceed is received from the BLEP by October 2021 and Grant Award is finalised by April 2022.

The proposal offers a unique capability that provides a compelling case for companies to locate at Westcott. The DISC is designed to lower the cost of entry to market for new ideas and provide the skilled workforce to bring them to fruition. It will stimulate innovation that leads to world-leading commercial ventures, taking innovative R&D projects from proof-of-concept through to full-scale production readiness.

To ensure that products are designed from the outset to meet real-user needs, DISC brings together “upstream” spacecraft builders with “downstream” users of space data and services. It will ensure rapid and effective roll-out that beats foreign competition, anchoring economic benefits in the UK. Existing skills and training providers will be engaged to ensure that the space sector has access to the specialist trained workforce it desperately needs to grow and flourish in the competitive world market.

By twinning with other regional facilities in the North-East, Midlands, South-West etc, the project will kick-start growth of UK-wide supply-chains and essential end-to-end capability for the UK space sector.

The Project is led by the Satellite Applications Catapult (non-for-profit, UKRI-backed organisation), which has pioneered and demonstrated the DISC concept at Harwell. The Harwell DISC is over-subscribed and accommodates, among others, Lockheed Martin’s UK based supply-chain for the MOOG-designed Orbital Manoeuvring Vehicle.

### B.2 Is the project expected to be going through another assurance process (by another LEP or funding body)?

No. DISC at Westcott is not expected to go through another assurance process.

### B.3 What is the current position of the project and what has changed between the submission of the Expression of Interest and OBC or between OBC and FBC? (dependent on which stage this template is being completed)

Excellent progress since the submission of the OBC (September 2019). The project has been further scoped; the building (RIBA) design stages are ongoing, outline planning permission is being drafted, and key capabilities have been identified. Five procurement rounds have been identified as key to ensure that long-lead capabilities can be procured in compliance with OJEU, within the timescales of the Grant project. *Contracts Agreement to Lease* and *Lease* templates have been drafted between PATRIZIA, (the site Landlord) and the Catapult, and the outline planning permission phase has already begun.

Industry momentum and demand is growing. Companies such as AVS and Lockheed Martin/ASTRA (see **Appendix 7 (DISC.A07.01) Case Studies**), as well as organisations like OneWeb, have been engaged (detailed in Section 3.1.3). These organisations are reliant upon key facilities being available to enable them to overcome the high barriers to market. Feedback and experience from industry indicates that, without this investment, innovation will take longer or not happen, or will be developed outside the UK. Since preparing the original draft of this business case, OneWeb has located to Westcott and will act as a major attractor for future DISC Users. The DISC capability will enable companies to align their products and services to the OneWeb supply-chain as it develops.

B.4 List any other organisations involved in project delivery and their roles (add lines if required)	
Partner Name	Role
<b>Satellite Applications Catapult</b>	<p><b>Project owner.</b> DISC is a Satellite Applications Catapult concept that has been developed to serve our objective of supporting the growth of the UK space Sector. We are working with industry and local training providers to:</p> <ul style="list-style-type: none"> <li>• Inform the design and building requirements</li> <li>• Work with PATRIZIA to provide design requirements to build the DISC facility</li> <li>• Source and equip DISC with specialist, state-of-the-art equipment</li> <li>• Establish skills provision for the DISC that meets training and re-skilling needs</li> <li>• Engage with central and local Government, industry, and academic partners to establish the Enterprise Alliance, secure tenants for the DISC facility, and longer-term residents of Westcott's space ecosystem.</li> </ul>
<b>PATRIZIA</b>	<p><b>Westcott Venture Park Site Landlord.</b> PATRIZIA will be responsible for the physical construction of the building that will house the DISC facility. As such, they will work with the Catapult, LEP, Local Authority, and the Westcott Space Board to deliver the building to meet market needs. This will include:</p> <ul style="list-style-type: none"> <li>• Providing the land for the DISC facility to be built on</li> <li>• Procuring the multi-disciplinary contractors to deliver the building</li> <li>• Managing all site access requirements.</li> </ul>
<b>Buckinghamshire LEP</b>	<p><b>Economic Partner.</b> The ambition for the sustainable growth and investment in Westcott Venture Park is one of the four pillars of Buckinghamshire's Local Industrial Strategy, which informs part of the Oxford-to-Cambridge ARC strategy. The LEP is a partner in supporting the Satellite Applications Catapult to achieve the social and economic benefits that DISC will deliver for the space-related advanced manufacturing capability in the region.</p>
<b>Westcott Space Board</b>	<p><b>Stakeholder.</b> The Board is made up of several organisations, regional partners, and space companies. It provides guidance that will ensure the DISC facility aligns to strategic, local, and business needs for sustained growth and success.</p>
<b>Westcott Space Skills Working Group</b>	<p><b>Stakeholder.</b> The Working Group reports into the Westcott Space Board. It is made up of several organisations to look at the collective needs of stakeholder for skills provision at Westcott. This group includes Bucks Skills Hub, the Catapult, the UK Space Agency, tenants at Westcott (including NAMMO), and a representative from the Arc Universities Group.</p>

B.5 Revision History			
Version Number	File Name	Date submitted	Summary of changes made compared to previous draft version <i>(please refer to previously received feedback and how issues have been addressed)</i>
0.01	Satellite Applications Catapult OBC DISC @ Westcott	15 August 19	
1.0	Full Business Case	June 20	<ul style="list-style-type: none"> <li>• Transposed into a new Business Case Template</li> <li>• Increased economic and commercial detail and clarity</li> <li>• Revised financial management costs</li> <li>• Greater detail on the Management Case</li> </ul>
1.1	Full Business Case	May 21	Revised business case to incorporate Skills provision
1.2	Full Business Case	August 21	Revised based on feedback from Hatch
1.3	Full Business Case	September 21	Revised based on project team schedule lessons identified

## 1. Strategic Case

Commercialisation of space is a global opportunity. Leading financiers such as Goldman Sachs are expecting the space sector to become a multi trillion-dollar market within the next two decades. Start-up space ventures have attracted over \$16.6bn of investment, including \$5.1bn in debt financing.

Established space industries in the US, China, India, Russia, and Europe will seek to protect their dominance in this sector. However, the wave of potential that the commercialisation of Low Earth Orbit Space brings to nations such as the UK is set to radically change this landscape. In this domain, disruptive innovation holds the key for new players to enter this rapidly expanding market. New technology will help companies lower the cost envelope for new products and services, while dramatically enhancing performance. As momentum builds, those actors gaining competitive advantage will create a new and progressive ecosystem of end-users and suppliers.

Creating the conditions in the UK to lower the entry barrier to market will attract sufficient levels of inward investment to build our own sovereign capability for this exciting growth opportunity. For the UK this presents a major opportunity to exploit the global and mobile nature of the space sector, with companies naturally drawn to those countries where the business environment is most favourable. Access to cutting-edge equipment at favourable rates and skills that support growth will be a powerful attractor to innovative companies, who will then nucleate the wider ecosystem.

The Satellite Applications Catapult strategy for achieving this goal is being delivered in three phases:

**Phase 1:** The first phase involved a pilot scheme to establish a Disruptive Innovation for Space Centre (DISC) at Harwell, Oxfordshire, as a means of demonstrating market need. The pilot phase was funded by OxLEP, and the centre was oversubscribed by industry before building was complete. It is now fully operational and home to, amongst others, Lockheed Martin's UK based SME supply-chain who are developing an advanced In-Orbit Service capability.

**Phase 2:** The **present Business Case** concerns the second phase of development, which is to build a full-scale DISC at Westcott as a catalyst for growth. As a location, Westcott was chosen because of its potential for expansion, particularly for large-scale manufacturing, and its capacity to verify and test safety-critical systems derived from its heritage as a rocket testing site. It is also geographically close to Harwell and its multidisciplinary R&D base and embedded within the Oxford-Cambridge Arc.

By lowering the entry barrier to market through affordable access to specialist equipment and skills development, the Westcott DISC will act as an attractor for industry, creating opportunities for collaboration, while stimulating the formation of new supply chains, which extend beyond Buckinghamshire to other parts of the UK.

**Phase 3:** Completion of phase 2 creates an immediate opportunity to use the Westcott DISC as a blueprint for Phase 3: **national deployment**. Early-stage business cases have already been developed for DISCs in other locations with the intent that each DISC is designed and configured to focus on specific local strengths and together form a DISC network that creates a national capability to meet UK space sector needs.

The Catapult commits to provide expertise (technical and business) alongside key capabilities that are out of reach for start-up and scale-up organisations. These capabilities will be incorporated into a 6,000m<sup>2</sup> centre at Westcott (4,000m<sup>2</sup> R&D and 2,000m<sup>2</sup> skills), enabling 1,593 direct and indirect jobs; delivering economic growth in the region and supporting areas of collaborative R&D activities that will drive innovation and the creation of new technologies.



*In summary, as a nation we must innovate to succeed in the modern world. Nowhere is this better exemplified than in the burgeoning commercial space arena. We have the talented people and institutions, but we need to give them the tools and resources to bring their ideas to market ahead of the competition.*

*DISC does this. It makes it easy for companies of all sizes, from large corporates to start-ups, to:*

- *Try out new ideas and develop new skills quickly*
- *Collaborate and work with end-users to optimise functionality*
- *Rapidly produce demonstrated products for the commercial market.*

*This is all enabled by a skilled local labour force which anchors these new ventures in the UK, and is delivered in a neutral, trusted environment that encourages collaboration and bold thinking.*

**Why Public Sector Investment?** Public sector investment is essential to kick-start the radical approach needed for the UK to compete successfully in the face of stiff global competition. To attract industry, DISC needs to be viewed as a neutral, trusted environment whose equipment is sourced using public funds, so that companies can use it with confidence without the risk of IP leakage. Public funding is crucial to establish the environment and to ensure this ethos is deployed from the outset. Public sector investment provides a core capability. It de-risks the potential for market and co-ordination failures and creates an entity that is attractive to commercial investors to ensure its long-term sustainability. In doing so it demonstrates the advantages of the neutral entity ethos, while ensuring that the growth generated is anchored in the UK.

Investment in DISC at Westcott will create a blueprint, via the County Deal, for ensuring that space-based assets developed in the UK are designed to meet the exacting requirements of multiple markets as they evolve. It also allows Buckinghamshire and the Government to showcase the potential that the County Deal can deliver for individuals and communities. DISC offers an environment for market engagement that allows industry to collaborate with potential end users to inform design decisions at the earliest phase of development. Potential customers, operating across multiple markets, are thus built into the design process at the earliest opportunity.

**What does the Public Investment produce?** Investment in Westcott DISC will be used to procure specialist equipment for the R&D element of DISC, which is in high demand but poor supply across the UK space sector due to the prohibitive initial cost of ownership. It will also equip the Skills Academy to aid training and workforce development. The building in which this equipment will be housed will be funded through private investment. Making specialist equipment available on a rental basis removes the investment barrier for individual companies and will benefit supply chains across the UK, generating the critical mass to have a major positive impact on the success of the UK space sector. The Westcott development will be documented to serve as a template for other DISCs across the UK that are tailored to local expertise in related innovative sectors.

**Why now?** The importance of space is recognised across UK Government, with the formation of the National Space Council and the re-vamping of Government departmental responsibilities to meet the demands of the new commercial space environment, including the future aspirations for the UK Space Agency. It is essential that industrial capability and capacity is in place to meet the ambitious goals that the Nation is being set. The Satellite Applications Catapult, in line with its mission, has invested a great deal of time and energy in developing the DISC concept with industry stakeholders, and it is important not to lose the momentum generated.

The public grant funding creates the foundation and establishes the environment for the DISC ecosystem development. This will be augmented by service offerings that scale around DISC operations which are best served through private investment to allow capability to continuously develop and evolve to meet business needs. This is where industry service providers perceive DISC differentiates itself from other innovation facilities, delivering a substantive return on investment.

The initial public sector investment not only bakes in the neutral, trusted entity ethos that is key to success, but also establishes DISC as a credible and investable enterprise with the commercial investor community. The combined use of public and private sector funding in this way creates an ideal environment for industry to accelerate development of design prototypes in readiness for production and commercialisation at other purpose-built production facilities housed locally or nationally.

The DISC ecosystem and its strategic goals are described in more detail below.

### Removing Barriers to Innovation

Space is a high-tech, highly skilled sector. Its applications extend over a very broad range of societal needs, and consequentially involve a complex set of stakeholders who can benefit from space-enabled technology and services.

While the space sector offers huge scope for innovation, demonstrating that new concepts are viable in the marketplace often requires major up-front investment in high-tech equipment that frequently exceeds the risk appetite for individual companies. This is a major barrier to unlocking the UK space sector's full potential. We need to be nimble and bold to succeed in a highly competitive, worldwide market that is historically driven by major government programmes and investments.

A central aim of DISC is to provide industry with access to the high-tech, high-cost equipment they need to the point that full commercialisation of novel concepts can be justified. By making the facilities available on a day-rate basis, the barriers of high initial Capex cost are removed until the tenants can build a sound business case for their innovation based on demonstrated capability and customer demand.

Providing the needed capital investment to procure this cutting-edge equipment is the primary purpose of the public sector grant request, alongside equipping the Skills Academy. Thereafter, equipment maintenance and renewal for both components of DISC will be paid for from the commercial revenue charged for their use. However, the capital grant and the equipment it provides is also crucial to kick-start the wider DISC ecosystem that will be developed by the Enterprise Alliance through commercial means. This will set the Westcott DISC apart as an exemplar for space sector growth in the UK.

### DISC as an Ecosystem

The DISC vision is to deliver an integrated environment that positively impacts Industry Strategic and Financial drivers. This is shown in Figure 1. Collectively, the integrated environment depicted by the 4-box model serves to create a DISC ecosystem that enables industry to collaborate with multiple stakeholders, including end users, in the design and development of new product and service concepts.

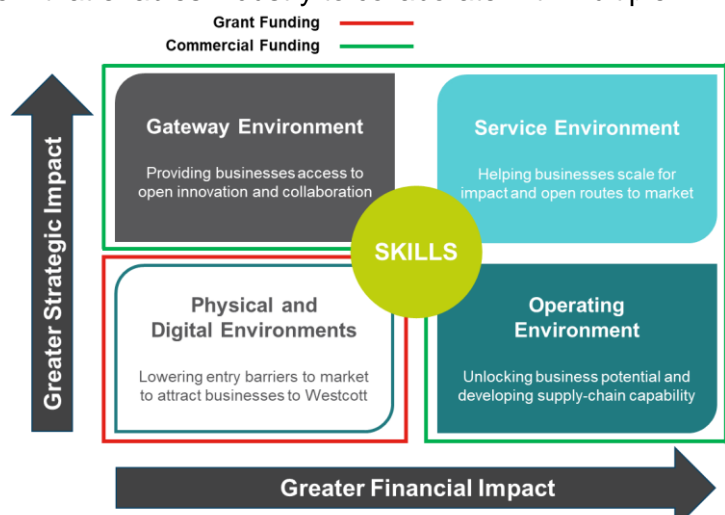
DISC provides industry with an opportunity not just to develop new designs, but to strengthen workforce skills and develop supply chain capability. It is this ecosystem that differentiates DISC from other innovation centres and provides the basis for establishing a network of DISC facilities (themed to meet regional needs) that will act as a catalyst for the UK space sector growth.

The ecosystem's four constituent parts were designed specifically to meet the space sector's needs for "new space" design, manufacture, prototyping and production readiness. They are described in more detail here.

#### 1 Physical and Digital Environment

Grant funding will be used to design, specify, and procure specialist equipment for the R&D component of DISC, and to equip the Skills Academy. This equipment will include digital assets to provide a connected dynamic, agile, and collaborative work environment

The DISC facility will be designed to provide a user experience that is geared toward getting the best out of people by providing attractive, productive, and healthy work surroundings, alongside the tools and enablers that deliver rapid innovation and growth. The digitally enhanced work environment will



*The DISC 4-box model for impact. The model sets out how the capital grant component fits into the overall picture and drives its development*

provide companies with the flexibility to employ staff locally or nationally by integrating virtual design environments within the facility design, manufacturing, test, and trial capability.

This approach breaks the historic model of separating innovation, evaluation, acceleration, and low volume production, bringing these stages into a single collaborative experience that accelerates and amplifies business success. In addition, it creates the benefit of co-locating skills development and the world of work to demonstrate the professionalism and value of the skills provision at the site.

## **2 Service Environment**

Companies using DISC will have access to a range of business services, skills development, and training capability:

- At a strategic level, DISC will offer Innovation-as-a-Service™ etc. to unlock business potential and optimise performance across newly formed DISC-enabled supply chains
- At a tactical level, users can access business support services to fill capability gaps in areas such as Commercial, Legal, Marketing, HR, Finance, business mentoring etc.

The skills provision is designed to address one of the major barriers to the long-term growth of the space industry, namely access to enough people with the required level of specialist skills. The remit of the DISC skills function is to encompass a broad range of training, from T Levels and apprenticeships for school leavers and those seeking an alternative to university, to retraining and upskilling of existing staff to meet the requirements of the modern space industry.

The aims and objectives meet the ambition of the Post-16 Education Bill<sup>1</sup> that was published in May 2021, and will contribute to Buckinghamshire's education landscape, creating the much-needed engineering capability identified in the Buckingham Local Skill Report 2021<sup>2</sup>. Locating the Skills Academy within DISC offers several advantages, including access to the state-of-the-art equipment housed within the facility and contact with the range of companies and experts using DISC.

As such, T Level, apprenticeship, and training entrants will have the opportunity to train on the latest equipment, and where appropriate, to work directly within industry supply-chains that may become their eventual employers. The skills provision also caters for companies anywhere in the UK who want their current staff to retrain on the latest techniques or equipment by providing specialised short courses. These employees, once trained, will serve to enhance the skills base nationally and support the local levelling-up agenda.

The DISC will work with existing training providers to design, implement, and run the Skills Academy, including Buckinghamshire Business First and the Buckinghamshire Skills Hub, local universities and regional training specialists. Once details are published by the Government, the Westcott Space Skills Working Group will work with the Council and LEP to ensure the training provision fulfils the requirements of the Local Skills Improvement Plan.

## **3 Gateway Environment**

As a catalyst for growth, DISC will attract significant levels of Inward Investment to Westcott and the surrounding region. As companies at DISC scale operations in readiness for production, they will need access to the wider domestic and international market. DISC's unique Gateway environment provides a much-needed portal for companies to interact with potential End-users of satellite-enabled solutions, and to collaborate with Government in opening new channels to market for UK developed applications, products and services. The Gateway environment provides a neutral, high-tech convening area where protagonists can collaborate to address the most pressing market-related issues for UK industry.

The Gateway comprises design tools, interactive space, and a demonstration theatre, modelled on effective existing Catapult facilities. These will be developed to industrial scale for operation on a commercially sustainable basis. The Gateway allows end users and industry to collaborate on rapid prototyping and demonstration of potential solutions to customer challenges, including those around corporate sustainability. The DISC service and support environment will be developed alongside the Gateway to ensure that its outputs are developed expeditiously and with appropriate rigor.

<sup>1</sup> <https://bills.parliament.uk/bills/2868/publications>

<sup>2</sup> <https://bucksskillshub.org/educator/resources/buckinghamshire-local-skills-report>

## 4 Operating Environment

In addition to the business services, the DISC operating environment will incorporate a range of support and maintenance services, with performance drivers embedded in the DISC service model. Service level responsibility for the performance, maintenance, and development of the DISC operating, gateway and service environments will be established and owned by an Enterprise Alliance (see Section 5). The Enterprise Alliance will also own the DISC business model and the commercial sustainability of operations.

By engaging industry and integrating user requirements into the final design of DISC at Westcott, the Enterprise Alliance will gather detailed user requirements for future facilities, equipment, and services to design and facilitate the growth of the wider Space Innovation Business Park at Westcott, building on the DISC foundations. This will ensure the infrastructure and service support environment are fit for purpose and attract the highest level of inward investment to the region. Services provided by DISC will be designed with its user community in mind. As it develops it will scale to meet the wider Westcott Space Innovation Business Park (£1.9Bn) ecosystem service demands.

### Westcott as a strategic location for DISC

Westcott's heritage as a rocket test site and proximity to key locations such as the Harwell Space Gateway and Oxford-to-Cambridge Innovation Arc, offer distinct advantages as a place to develop novel satellite and related technologies. Westcott's central location within the Arc and easy access to London and national transport links are attractive to companies entering the UK space market. It's County Deal ambition, of which this forms a part, also allows us to showcase the impact of this investment on the individuals, communities and businesses who will benefit from it.

The site has sufficient capacity for testing operationally, and occasionally dangerous, critical systems and has the freedom to design the necessary levels of security, safety, and regulatory regimes into a purpose-built, high impact environment. This will be an important feature of Westcott for development and testing of rocket and spacecraft propulsion and other systems such as pressure tanks, and autonomous vehicles.

Westcott has good links with the multidisciplinary Harwell Science & Innovation Campus whose primary focus is R&D. The two sites complement each other well, with Westcott having the secure test and development environment and grow-on space for manufacturing that is not available at Harwell. As emphasised elsewhere in this case, the UK needs multiple centres of expertise in order to fulfil its potential in the new space industry, and Harwell and Westcott form a good basis upon which to grow a national network of such capabilities.

Westcott is also well connected to other UK regions, sharing a natural link to developing orbital launch sites in Scotland and Cornwall, to rocket and drone testing sites in Wales, and to supply-chain companies and downstream user communities throughout the country.

From a skills perspective, Buckinghamshire has identified space as a strategic growth sector for the county; it is one of six<sup>3</sup>. Whilst there is a plan to support access to skills and opportunities for the other sectors, until commitment is secured for the DISC funding, there is limited opportunity for the space sector provision to progress at pace, and with the desired impact.

The Satellite Applications Catapult is one of nine Catapults established to transform the UK's capability for innovation and help drive future economic growth. The Satellite Applications Catapult's DISC solution is a pathfinder and natural environment for the wider Catapult Network to work with industry on a range of high impact projects for both upstream and downstream applications.

### A. Skills Academy within the DISC

<sup>3</sup> The other sectors are Creative, High-Performance Engineering, Construction, Digital and Health and Social Care. Page 14 of the Buckinghamshire Local Skills Report show's initiatives for all, but not space.



**“We’re not giving anywhere near enough of the right kind of training or support to the fifty per cent of young people who don’t want to go to university, and so we’re depriving them of the chance to find their vocation and develop a fulfilling, well-paid career.**

**And so, the result is business isn’t happy; the economy is under-productive; and many working adults are stuck in jobs without much future when they are hungry for new opportunities. So, it is time for change, and for radical change.”**

***Prime Minister Boris Johnson’s Lifetime Guarantee Speech  
29 September 2020***

This business case includes provision for skills at Westcott within the DISC. Access to a skilled workforce, particularly at the technical and engineering level, is a fundamental requirement for realising the growth ambitions of the space sector. The skills offering is therefore a crucial element of the ecosystem we need to create at Westcott, in parallel with the R&D facilities.

The vision is for Westcott to be a UK and global exemplar for skills development aligned to the needs of space and its applications. The Westcott skills provision will offer a continuum of training opportunities for post Key Stage 4 (16 y-old) individuals ranging from T levels and apprenticeships to retraining those looking for a career change and upskilling existing workers. Co-location within the R&D provision and other Westcott developments will provide an inspirational and productive experience where trainees can be immersed in the dynamic and innovative real-world environment of space, exposed to the latest developments and with access to leading industry experts. At the same time, companies at Westcott will have access to the best talent, trained in the right skills for their needs, and with the ability to influence the training curriculum as those needs evolve. This will greatly add to the attractiveness and benefits of being at Westcott.

The developments at Westcott will provide much-needed opportunities for children in Buckinghamshire to work in an exciting, productive, and rewarding engineering sector. The Buckinghamshire Local Skills Report 2021 identifies 15 skills challenges the county currently faces, and through DISC’s skills provision, this investment will contribute to addressing seven of those challenges:

<b>Buckinghamshire Skills Challenges<sup>4</sup></b>	<b>DISC Skills Mitigation</b>
Retraining and attracting talent	Destination dedicated to engineering and sector-specific training opportunities Out-reach and engagement programme
Low take-up of apprenticeships	Team promoting Manufacturing Technician and Space Technician apprenticeships (initially) to local schools. Provide information to those providing redundancy support as part of Buckinghamshire’s Economic Recovery Plan
A lack of engineering training provision in the county	Dedicated engineering training facility in the South of the County attracting talent from Aylesbury, High Wycombe, Princess Risborough, as well as neighbouring Bicester and Thame. DISC will also seek to collaborate with the engineering skills activity at Silverstone as there are several complementary areas between automotive and space-related advanced manufacturing
Lower than average levels of training by county employees	In addition to T Level and apprenticeship training, the DISC will also offer short, medium, and longer-term specialist training on behalf of the sector, including micro-accreditations
Large number of SMEs find it difficult to navigate government funded training provision	The team operating the skills provision within DISC will work with Buckinghamshire Skills Hub and Buckinghamshire Business First to help businesses identify and access the funding available through Government, e.g., the Lifelong Loan

<sup>4</sup> Chapter 3, Skills strengths, and needs (page 8) Buckinghamshire Local Skills Report 2021



Need to ensure strong talent pipeline for growing sectors	As this proposal outlines, critical to the success of the DISC skills provision is a meaningful and engaging outreach programme across Buckinghamshire and even those part of Oxfordshire that are nearby.
Need to ensure opportunities in growth sectors are accessible to all	<p>This activity will focus on:</p> <ul style="list-style-type: none"> <li>• Bringing the curriculum to life to stimulate excitement for the sector and job potential for those making post-16 study choices</li> <li>• Highlighting that the facility is here and has an excellent reputation for high-quality teaching and progression into work for those who are looking to reskill and/or upskill</li> </ul>

To attract future students, our intention is to create a pipeline of talent by working with schools and other local providers to showcase the opportunities on offer to pupils, starting at Key Stage 1.

A very important role for the skills provision will be to upskill existing workers, offering training in the latest techniques and equipment in this rapidly evolving sector, and to re-skill workers in adjacent sectors to work in the space industry. The Government's introduction of the Lifelong Loan Entitlement (due in 2025) will remove some of the financial burden on those who are looking to retrain, helping to attract skilled mature workers in addition to school leavers. The Westcott Space Skills Working Group will engage local and regional expert partners to deliver the curriculum and provide the range and flexibility of expertise that the venture requires.

Physically, the skills offering will comprise a 2,000 sqm facility as part of the DISC. As with the R&D facilities the building accommodation will be provided by the site landlord, PATRIZIA, and the grant funding will be used to fit-out and equip the facility in readiness for the first courses starting.

### **What does it look like and why this design?**

The Skills Academy will complement the R&D provision whilst developing a unique offering aligned, ultimately, to the space sector. This delivers a broad range of skills that are transferable to a variety of other sectors. We recognise that, in the early years, the approach and provision require sufficient breadth to meet local needs whilst allowing the skills provision to grow with the ecosystem.

The skills site will accommodate up to 170 students and visitors at any one time. To offer as much flexibility and future-proofing as possible, its design will offer a blend of fixed-purpose rooms (those with heavy and fixed equipment) and flexible learning spaces with movable wall partitions to adapt classroom size to specific needs. The grant investment in skills (amounting to about £10m) will be used to buy equipment for the courses identified and cohort size over the first 5 years.

Over time, our intention is to focus the service increasingly on the space offering and aligned fields to demonstrate the need to add further phases or identify a new site in Buckinghamshire to continue to meet non-space engineering and manufacturing requirements.

By co-locating the skills and R&D provision at DISC we are actively changing the mindset of the students from school to the workplace. With diversity of work and the buzz of activity, we can reinforce that the career path chosen, and the associated environment, are exciting and rewarding for everyone.

The DISC facility will be designed to be flexible in both its structure and application; rooms can be adjusted to provide separate, dedicated learning spaces or more collaborative, open spaces. To deliver best value, as and when required, rooms in the skills area of DISC can be made available to DISC businesses for specialist training, and vice versa. Where possible we will look to common areas such as the reception space, meeting rooms, canteen / catering facilities, and potentially even an on-site gym to secure additional revenue whilst supporting active and healthy lifestyles.

The goal is for the building to offer a joint atrium which, combined with flexible classroom/meeting facilities on the ground floor, can be used for conferences, exhibitions, and networking events. There is a need for this space at Westcott and locating it in this facility ensures the building is always utilised to its fullest, whilst also showcasing the R&D and skills provision to visitors to Westcott.

### **Finding the right partner to deliver Government and Westcott's ambition**

There are several potential training providers who can deliver the curriculum provision for the T Level and apprenticeship courses. We intend to engage once funding is confirmed, running a procurement exercise which will be overseen by the Westcott Space Skills Working Group. The provider will be selected from the Government's approved training providers, with organisations currently being considered listed in the following table

Potential Training Provider	Value Add to the DISC Skills Academy
<b>ARC University (e.g., Cranfield)</b>	The Arc region is fortunate to have some world-leading universities in it. Including their expertise in the training provision at Westcott will offer additional incentive for those pursuing a more practical, hands-on learning experience.
<b>Leicester University</b>	The University were a lead in the Trailblazer Group that designed the Space Technician Apprenticeship. As such they are well placed to deliver the quality and ambition of the curriculum
<b>MTC</b>	MTC is part of the Catapult network and is already successfully operating the Oxford Advanced Skills Facility in Culham
<b>NMITE</b>	The University in Hereford was designed to reimagine how a practical, technical, and entrepreneurial, real-world curriculum can work. Taking these principles and applying them to the T Level and apprenticeship routes will demonstrate innovation in this space
<b>General training Provider (e.g., Advanced Learning)</b>	Whilst not offering the technical specialisms of the others, general training providers provide 'off-the-shelf' solutions and a pool of lecturers available to deliver at pace.

**Table 2. Training Provider Consideration.** *In selecting a partner to deliver the curriculum we need someone with the vision and ambition of the Westcott Space Innovation Ecosystem*

When designing the procurement criteria for the training provider selection we will ensure that the priorities and needs of the skills provision, the students, businesses, and Westcott community are the primary consideration. What we choose needs to work in the real world, not just be a good sales pitch.

In addition to the core training provider(s) discussed above, we will also seek to offer specialised training to upskill and/or retrain existing workers in cutting edge techniques relevant to the space industry. These courses could be offered by specialist providers, and will include topics such as hazardous material handling, clean-room processes, and operation of novel machinery such as those used in additive manufacturing.

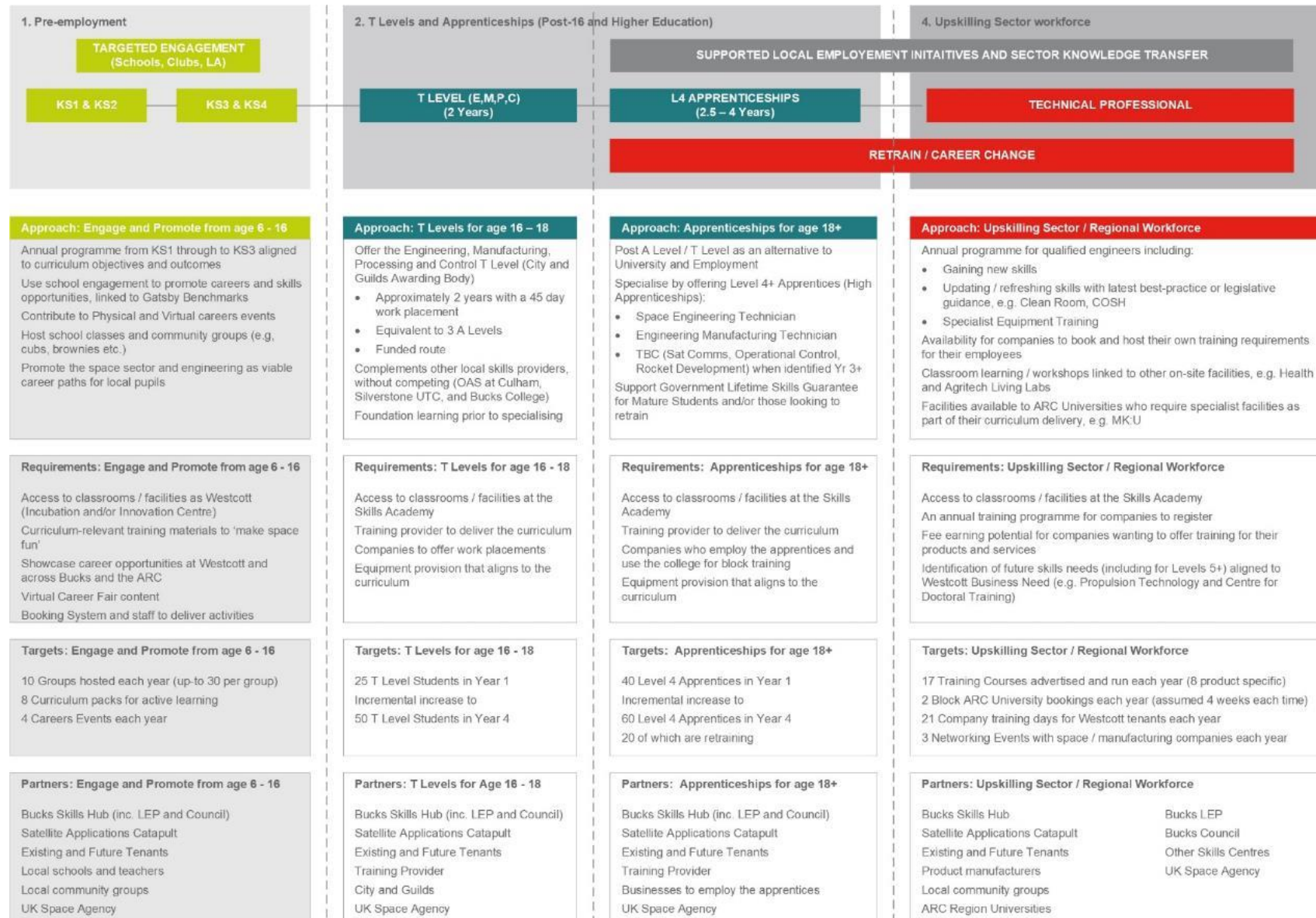
### Implementing the Skills Academy

Ultimately, we envision that the Skills Academy will be the responsibility of the Enterprise Alliance (EA), described elsewhere, that will operate the DISC and its service environment in the long term. To this end, the Catapult has already begun engagement with potential Skills providers who could join the EA, and these will be consulted regarding the design, both of the facility and the course content. **Outreach and Engagement starts now**

As with the procurement of the training provider, as the work begins on building the DISC we will need to identify our first T Level and apprenticeship students. As a team, we will formalise and implement the outreach programme to schools, students and parents, and businesses.

The Skills Continuum on the next page sets-out the training and learning opportunities that will be available at DISC in Westcott. Over the next 3 – 6 months the Westcott Space Skills Working Group will work together to identify specific targets, partners, and procurement requirements to deliver the end-to-end learning provision at this location.

In addition, further details on the plans for the Skills at DISC are contained in the **Appendix 11 Skills Overview. (DISC.A11.01)**.



**Skills Continuum.** The continuum has been designed to provide the opportunities, skills and needs to create a skilled workforce that will deliver innovation and solutions at Westcott

## 1.1 Aims and objectives

### 1.1.1 Project aim

DISC is the cornerstone that will spur the development of the wider Westcott Space Innovation Business Park. It addresses the National Space Policy – Government's commitment to develop new space clusters, working with LEPs and Devolved Administrations<sup>5</sup>, and to leverage the benefits of in-space infrastructure for the wider economy.

The Catapult commits to provide expertise (technical and business) alongside key capabilities that are out of reach for start-up and scale-up organisations. These capabilities will be incorporated into a 6,000m<sup>2</sup> centre (4,000m<sup>2</sup> R&D and 2,000m<sup>2</sup> skills), enabling 1,593 direct and indirect jobs; delivering economic growth in the region and supporting areas of collaborative R&D activities that will drive innovation and the creation of new technologies.

The £30m funds will deliver a return on investment of **4.38:1 BCR** and will create at least **900 direct jobs**. Regionally, the thematic focus areas of each DISC are designed to act as a catalyst for growth. DISC at Westcott will further exploit initial investments by:

- The Catapult / LEP in Future Networks, Incubation and Innovation Centres
- The UK Space Agency in a National Space Propulsion Test Facility.

Westcott will also focus on expanding the satellites and propulsion offer alongside developing applications, and engaging end users, in Health, Agritech and other markets.

The Phase 1 pilot DISC in Harwell has a focus on creating novel concepts for the development and launch of small satellites and in-orbit services. It is oversubscribed and creating demand for construction of near-future production and dedicated manufacturing facilities. Two of the Harwell DISC users (Lockheed Martin and Open Cosmos) forecast that DISC-enabled product and service lines will generate circa. 100 new and local high-tech jobs per supply chain (once in full production).

The Phase 2 DISC at Westcott will support similar growth at a larger scale. Catering to both upstream and downstream companies, who have already identified DISC as a key enabler for them, it will be equipped to handle a wide range of disruptive innovation projects, focusing operations on specific transformational change opportunities, and deploying technology, products, and services to the widest possible market.

- Space Manufacturing and Operations will benefit the 'upstream' satellite development market, helping businesses develop their products, which will drive New Space innovation, creating high-skilled manufacturing jobs. Once deployed these new satellites will require operational services to manage them from the ground, creating further opportunities for skilled employment.
- The burgeoning satellite constellation market and access to space-derived data will create further potential for satellite applications and services, including comms, navigation, broadcast and Earth observation, and for application of advanced machine learning and AI solutions to process the vast quantity of information that these systems produce.
- The skills provision will support the growth plans for individual businesses and the wider sector, focused on engineering and high-value/precision manufacturing.

The DISC at Westcott will also serve parallel markets that are closely aligned to space in terms of technology, instrumentation, and applications such as autonomous vehicles, advanced communications and IoT.

This is achieved within a Subsidy Control (previously State Aid) compliant operating environment; please see 4.4.2.

<sup>5</sup> The National Space Policy commits Government to developing new space clusters, working with Local Enterprise Partnerships (LEPs) and Devolved Administrations. The UK Space Agency and Satellite Applications Catapult have engaged with the Devolved Administrations and LEPs across the breadth of England and a number of these are now building upon these engagements with their own investments to grow their nascent local space sectors. (Space Sector Report, House of Commons Committee – Exiting from the European Union)

The DISC is helping address multiple current sector challenges. It is recognised that larger companies are not exploiting the creativity and agility of small, research-intensive manufacturers which could be a source of innovation. As such this new DISC innovation ecosystem will:

- Enable companies of all sizes to rapidly develop and demonstrate new products, and facilitate collaboration, partnership, and supply chain development to bring these rapidly to market.
- Accelerate regional growth, providing a critical entry point for UK enterprise to a growing £400bn global space market.<sup>6</sup>
- Attract, through exploitation of disruptive space-sector innovation, commercial enterprise and business entrepreneurs to Buckinghamshire and the Arc region, generating £501m of Net Additional Benefits and 1,593 new (direct and indirect) jobs.
- Address the UK skills gap by increasing STEM, T Level, apprenticeship, and re-training opportunities.<sup>7</sup> The skills provision will help meet demand and ensure skilled workers are available to companies as they locate to the Westcott DISC, as set out in **Appendix 11 Skills Overview (DISC.A11.01)**
- Provide the best mechanism (independent, neutral funding) to create an open and trusted environment for multi-stakeholder engagement.

DISC will lower the entry barrier to the market. It will allow SMEs to participate in projects usually beyond their financial and technical reach and act as a staging post for companies to experiment with new ideas and new partnerships, whilst controlling their exposure to risk.

Conversely, it mitigates one of the strategic risks large companies have - to remain at the top of their industry when disruptive innovation creates a significant market change. Many companies report that participation in disruptive innovation is a high risk/reward strategy and prefer, where possible, to collaborate with smaller, agile organisations to minimise their exposure.

It is this flexibility that has attracted companies like Lockheed Martin to optimise DISC, using it to invest in skills and supply-chain capability. In doing so, they are bringing inward investment into the UK whilst nurturing IP generation through new products and services.

### 1.1.2 Investment objectives

Objective	Quantity / Scope	By when
<b>Specific</b>	Create a new, 6,000m <sup>2</sup> purpose-built low volume advanced-manufacturing, test and verification facility for market-disruptive satellite innovation and related areas, including a 4000m <sup>2</sup> purpose-built R&D innovation facility and a 2000m <sup>2</sup> Skills Academy.  This will create a throughput of businesses generating IP and new products and services, complementing wider Government ambition for UK launch capability.	30 months from grant receipt
<b>Measurable</b>	Through DISC we will be able to measure the number of businesses using the facility and establishing a presence in Buckinghamshire. This will include the following: <ul style="list-style-type: none"> <li>• Number of jobs created through the use of DISC(directly and indirectly)</li> <li>• Knowledge spillover benefits</li> </ul> Evidence and analysis that informs future 'Size and Market of the UK Space Industry' Reports.	By 2039/40:  1,593 jobs £167m in knowledge spillovers

<sup>6</sup> There are two leading measures of the global space economy: the OECD's Space Economy at a Glance 2014 and The Space Foundation's The Space Report 2014. These organisations valued global space activity in 2013 at \$256bn and \$314bn respectively. Given industry expectations for the long-run trend of 5% growth in the global space sector to continue to 2030, the anticipated size of the global space economy in 2030 is \$587bn (OECD methodology) or \$720bn (Space Foundation).

<sup>7</sup> There is a significant skills shortage in the UK space sector with 24% of companies surveyed stating that Shortage of skills was a Growth Barrier for their business (London Economics (2020) Size and Health of the UK Space Industry)



<b>Achievable</b>	We have already commissioned new-build facilities at Westcott, the most recent being the Innovation Centre. As such we have relationships with local partners to successfully deliver a fully equipped building and establish that there is market appetite to use the facility as soon as it is ready for occupancy.  In addition, through our Harwell DISC market engagement and demand generation, we know there is demand, and that this concept and the capacity it will generate is not being replicated elsewhere.	30 months from Grant receipt
<b>Realistic</b>	We have the blueprint, experience and potential tenants to deliver initial impact and return on investment for Bucks LEP from 2024.	30 months from Grant receipt
<b>Timely</b>	Once the funding is secured, we can move quickly to finalise the designs and tender the construction works. We need to do this to ensure tenants remain committed to Westcott and not go elsewhere.	8 months from Grant receipt

### 1.1.3 Alignment with BLEP strategic objectives

Westcott is one of Buckinghamshire LEP's four nationally and internationally significant economic assets named in the Local Industrial Strategy. The LEP has been a strategic partner, alongside the Satellite Applications Catapult, the site owners PATRIZIA, and the Space Cluster Board in the development of the Westcott Space Innovation Business Park, which has the DISC ethos at its core.

Westcott is our first opportunity to design a space-based ecosystem from the outset. It takes time to build relationships with stakeholders and clearly understand how the space ecosystem can complement their ambition for their place, and we have made excellent progress in this already. We are fortunate that in Buckinghamshire LEP we have found a strong and committed partner, who see Westcott as a location to achieve their Local Industrial Strategy ambition. Creating this long-term plan brings together the three elements central to delivering a successful Place-focused framework:

#### Sustainable Strategically

- How does the ecosystem fit into our Local Industrial Strategy, and the ambitions for our Place?
- What is the sequencing of the rollout to deliver impact? What are the critical Genesis tools?

Buckinghamshire LEP's Local Industrial Strategy<sup>8</sup> states, '*The challenge for Westcott...is to develop a separate strategy which complements the capabilities of businesses in other areas in a commercially sustainable way. Westcott's capabilities and site designation mean that it is particularly well-suited to higher level specialist production, technology readiness level testing and demonstration activities. A significant opportunity exists for a distinct offer in relation to launch, 5G and in-orbit services*'(p 22). The DISC facility is the enabler for this ambition. It allows businesses to develop, prototype, and refine specialist solutions. In doing so it will attract business, innovation, and inward investment supported by the skills provision, which will ensure the necessary talent is in place to fully exploit the business opportunities.

#### Sustainable Financially

- Where can we source investment to initiate the Plan e.g., through LEP secured Government funding, investment from the landlord?
- What is needed to create the long-term sustainability and investor's economic return?

DISC is designed for companies to use for a relatively short period of time, to get ideas off the ground. The throughput of businesses and DISC's central role in driving the growth of the wider Westcott Space Innovation Business Park means that we can collectively support those businesses to establish a long-term base at Westcott and supply the necessary talent pool to sustain growth. This complements two areas of the LEP's Local Industrial ambition. Firstly, supporting their aim "to grow Buckinghamshire's £16.4bn economy that currently produces the highest levels of productivity in the Oxford-Cambridge Arc (the Arc), into a world leading business location where investments

<sup>8</sup> <https://www.buckstvlpe.co.uk/wp-content/uploads/2019/07/Buckinghamshire-Local-Industrial-Strategy.pdf>

*flourish and innovation thrives’ (p4) and secondly through growing ‘its overall productivity and therefore its overall contribution to the UK economy by helping businesses to improve their productivity, their desire to innovate and reduce their costs’ (p 46)*

### Sustainable Communities

- How do we take communities on the journey and showcase the potential for them?
- What opportunities are there for residents?
- What does success look like for businesses?

*‘Buckinghamshire has a major asset in its people. The population is highly educated and benefits from several significant technical education institutions. However, there are various challenges in Buckinghamshire’s skills system – including apprenticeship pathways, mid-level occupations and the need for increased social mobility, especially for those following vocational learning opportunities’ (p 9 – 10). It is the skilled workforce in and around Westcott that makes it an attractive proposition for businesses looking to use DISC as the springboard for their business.*

However, as the LEP rightly says, *‘to tackle the skills challenge, Buckinghamshire partners need to work across the whole skills system to address productivity issues relating to skill shortages through a skills and inspiration revolution...[to] ensure that a high-quality choice is available to all, raising aspirations and ambitions, leading to inspiring career paths and exciting well-paid jobs.’* DISC is the starting point for this. As the Space Innovation Business Park builds around it, and because of it, we need to support the continued growth in skill and access to employment that creates vibrant and successful communities and businesses. The Westcott Skills Working Group will be tasked with making this real through the vehicle of the Skills Academy in the DISC, supporting local requirements in line with the Post-16 Education Bill.

*‘Place is a central theme of this [Local Industrial] strategy. The actions have a core place focus and intend to use the planned major development in Buckinghamshire as a platform for testing, applying and commercialising ideas and innovations. There is also commitment to ensuring that action is taken to make the area a more attractive and affordable place to live, work and invest’.* (p54)

## 1.2 Project context

### 1.2.1 PESTLE analysis

**Political** - Post COVID-19 and Brexit, the UK will need to establish sovereign capability that not only supports national security interests but creates the conditions for long-term sustainable growth. DISC, as a genesis/ blueprint, can be emulated in other regions. The UK also needs to ensure, as part of its levelling-up agenda and building back better priorities, that we have the opportunities for all who currently live, work and learn in Buckinghamshire, to have access to the skills development that we need to fulfil UK growth potential.

**Economic** - At full capacity, DISC will support multiple prototypes, businesses, and SMEs simultaneously. This is achieved by providing innovation facilities that lower the entry barrier to market, leading to production centres that create capacity for commercialising products and services.

**Social** - Jobs and apprenticeships generated through DISC and follow-on activities will have a dramatic and positive impact on the local community, stimulating demand for new schools, shops, houses, transport links etc and contributing significantly to the BLEP social agenda. One of the objectives of the Post-16 Education Bill is to help ‘more people into work, and locally so they no longer need to leave their local area’.<sup>9</sup> Alignment to the Buckinghamshire Local Skills Report will be a contributing factor to achieving that through Westcott.

**Technological** – The DISC allows the prototyping of the next generation of products and services for space and related sectors and the markets they serve.

<sup>9</sup> <https://educationhub.blog.gov.uk/2021/05/25/three-key-things-the-new-skills-bill-will-do-for-you/>

**Legal** - The business park is privately owned yet supported by BLEP as a strategic site within the Aylesbury Vale Enterprise Zone. This is ideal for creating a focused ecosystem through a multi-phased approach. The DISC is a critical element of that ambition to expand the operation to meet industry demand. Local communities will benefit from the social spin-offs that increased revenues and spending power provide e.g., shops, leisure, hobbies, interests, charity, and community care.

**Environmental** – The DISC will be set to meet the highest standard for ecological and environmental concerns for advanced manufacturing capability. It will focus on light industrial manufacturing which is low impact on the environment and ensuring natural habitats for wildlife in the areas surrounding the facility are developed and maintained, delivering an attractive working environment.

### 1.2.2 Organisational context

The Catapult is a not-for-profit company. It is one of a network of Catapult's established by Innovate UK (part of UK Research & Innovation responsible to the Department for Business, Energy and Industrial Strategy (BEIS)) to accelerate the take-up of emerging technologies.

We act as a neutral, trusted entry point to an entire network of UK expertise in applications development across government, academia, and industry. Our primary purpose is to promote, develop and facilitate the commercialisation and advancement of the satellite applications industry and our strategy is to:

- 'Energise' markets by stimulating demand and overcoming barriers to innovation adoption
- 'Empower' technologies, accelerating TRL development towards new market opportunities
- 'Enable' businesses to overcome the unique challenges of working with space-based services.

The Catapult brings together multi-disciplinary and skilled teams to generate ideas and solutions in an open, innovative, and collaborative environment. To complement that we have a wide range of facilities, platforms, and laboratories to enable the best businesses, researchers, and end users to work together to develop new satellite-based products, services, and applications - translating ideas from concept to market. DISC is one of our strategic facilities and fundamental to us achieving our strategy and delivering the growth targets for the UK space sector. As stated previously, it is a disruptive solution that gives SMEs an opportunity that would otherwise be unavailable to them.

The following are strategic documents that DISC aligns to:

- [Satellite Applications Catapult 2018 – 2023 Strategy](#)
- DISC [Brochure](#)
- [Satellite Applications Catapult Impact](#)

### 1.2.3 Policy context

This section highlights the alignment of DISC to national, sub-regional and local policy aligned to the five pillars of the Industrial Strategy: Place, Business Environment, Ideas, People, and Infrastructure.

#### Space creates opportunities to deliver the UK's National Strategies

**“Here in the UK we have a powerful, innovative space sector, inspiring and improving lives, and bringing in billions to our economy every year. We are rightly proud and need to preserve and build upon our success. There will be many transformations ahead in our use of satellite technology and space programmes which will lead to discovery, jobs and growth, radically improving transport, agriculture, education, entertainment and much more besides.”<sup>10</sup>**

The Catapult's relationship and collaboration with the UK Space Agency allows us to contribute and shape the future of the UK's space ambition. DISC is recognised by both the Agency and Central Government as being an enabler of that ambition. The following highlights the opportunities that are available and ready to be exploited through the new DISC facility.

<sup>10</sup> HM Government National Space Policy, p3:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/484864/NSP\\_-\\_Final.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/484864/NSP_-_Final.pdf)

In his opening statement of the UK National Space Policy, the Secretary of State writes, '*We must create the conditions in which businesses and others have the confidence to invest in an infrastructure that will support their future success*<sup>11</sup>.' As an environment for companies to develop and prototype their products, DISC at Westcott can play an active role in delivering future success. For example, the UK launch ambition is set out in the Industrial Strategy<sup>12</sup>: '*The [£50m UK spaceport] investments will give the UK end-to-end capability in the building, testing, and launching of small satellites, boosting our economy and inspiring the next generation of scientists and engineers...UK spaceports could access a global market for launching small satellites worth £10bn over 10 years*'. With a focus on satellite manufacture and propulsion Westcott's DISC will be a critical piece of national infrastructure to deliver this ambition.

The UK Space Agency is responsible for the launch activity. It is also an active member of the Westcott Space Cluster and a tenant on the site. As such, they are ideally placed to promote DISC on the site as a destination to support opportunities for indigenous UK launch.

### **Industrialisation of Space is Creating a Global Opportunity**

The space sector is at a tipping point with analysts such as Goldman Sachs believing the space sector will become a multi trillion-dollar market in the next two decades<sup>13</sup>.

Globally, space-enabled data is hugely important and continues to offer a major opportunity in the UK. Few sectors in modern economies are untouched by digital services with a significant portion enabled by space. London Economics latest Size & Health Survey<sup>14</sup> suggests the space sector already underpins £300bn or 15% of activity across the UK economy. This is set to grow significantly as digital transformation advances across the country.

**The satellite communications market** remains significant (>\$100bn) and is in an exciting period of reshaping. A new generation of thinkers, engineers, entrepreneurs, and venture capitalists recognise the opportunity created by the current industry economics. By 2025 these new entrants are going to fundamentally change the economics of commercial communications satellites, reinventing nearly every satellite component and system. In the 5G era, satellite technology will offer complementary capacity and performance to support ubiquitous deployment of 5G. In fact, we are now working on the 6G standards which will be even more inclusive of satellite as an integrated network alongside terrestrial ones. Through our support, UK businesses will play a leading role from Westcott.

**Geospatial technologies and data** are underpinning decision-making processes in both Government and business and are increasingly recognised as key in helping to mitigate climate change. The UK is widely recognised as being a leading user of geospatial technologies (second only after the USA). This is supported by a vibrant service industry. Space and satellite data are also increasingly needed by governments, regulators, investors, businesses, and asset owners as the transition to a low carbon future is realised.

From spaceports to launch companies these new services are supporting the development of many advances in access to space from which the UK can capitalise. The UK now has:

- Spaceports developing in Scotland and Cornwall
- Leading launch companies in Orbex, Lockheed Martin/ABL, Reaction Engines, Virgin Orbit and Skyro.

More than 100 launch companies have now been created globally. To enable UK advantage in this area of key strategic importance as the market matures, we are supporting the development of supply chains and demand. Technology remains a challenge but is no longer the main blocker. Ambition, commercial innovation and a coordinated and creative approach between governments and commercial private enterprise is needed in expanding our economic horizons. We see DISC as an enabler to helping companies demonstrate their potential, showcase their ambition and innovation through prototypes, helping them secure funding to succeed and grow.

<sup>11</sup> HM Government National Space Policy, p4:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/484864/NSP\\_-\\_Final.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/484864/NSP_-_Final.pdf)

<sup>12</sup> Industrial Strategy page 139 and page 142

<sup>13</sup> Space – The Next Investment Frontier, Profiles in Innovation, Goldman Sachs Equity Research, April 2017

<sup>14</sup> <https://londonconomics.co.uk/wp-content/uploads/2018/06/LE-UKSA-SizeHealth2018-Questionnaire.pdf>



Welcoming the UK Government's ambition for space, we agree it is a time for big thinking, innovation and global cooperation with the aim of driving exponential benefits to Earth. Activity and interest in space is building. It is critical to our sustainable future.

### **Supporting our expanding economic horizons in space**

Companies innovating in the new space market have attracted \$13.3bn investment since 2000<sup>15</sup>. Between SpaceX, Telesat and Amazon's Project Kuiper and new operators, over 10,000 satellites will be launched in the next few years; five times the number of objects sent to space in the past 60 years<sup>16</sup>. Analysts are predicting the rolling five-year growth rate for smallsats to peak at 48% by 2024<sup>17</sup>. The UK is a market leader in small satellite manufacturing with a ~20% share. Making DISC accessible to these companies, the UK and region can support the UK's increased market share by supporting these new satellite operators and new value propositions for satellite data and services.

Non-UK entrants see the UK as a place to grow their business (D-Orbit hired its first UK staff in 2019). One of the big prizes we are targeting for the UK is the \$9.7bn downstream revenue opportunity over the next decade in small-sat EO.

Low-cost launch is enabling new opportunities. The global space launch services market will grow from \$8.88bn in 2017 to \$27.18bn by 2025. The UK is developing a small satellite vertical launch facilities in Scotland and a horizontal launch spaceport in Cornwall.

In-Orbit manufacture will open new horizons for the space sector, with a growing market predicted to be \$300m by 2027<sup>18</sup>. Four of the top new businesses in in-orbit servicing are based in the UK, attracted by the UK's regulatory environment. Our activities are expected to contribute c.£733m of attributable impact by 2023: In-Orbit Servicing £14m, Spacecraft Manufacturing £122m, LEO SatComms/IoT £38m, Sigint £108m, Quantum Security £2m, Launch Services £54m, Satellite Operations £100m, Missions as a Service £225m, and Earth Observation £72m.

**The key challenge for the UK is simply the scale of the UK space sector (both sector size and funding) and its ability to scale-up to capture opportunities**, particularly relative to other countries. At the headline level, the UK space sector is a relatively healthy circa £14Bn and growing. Whilst the absolute size of the sector by revenue has been increasing, its proportion of the global industry has been decreasing (from 6% to 5.1% since 2010). Under the surface the sector has challenges.

**The UK space industry, as of end of 2020, comprises 1,218 organisations, with 95 new entrants since 2018.**<sup>19</sup> As the opportunity from space grows, we need to bring other businesses toward the sector, stimulate new ones and support existing ones to re-shape toward making the UK sector fit for the opportunities of the 21<sup>st</sup> century. DISC will support our activity. As we have seen with the first facility at Harwell, Oxfordshire, the concept, approach and flexibility is what the industry needs and wants.

The UK Space Agency is working with several stakeholders, including the Catapult, to ensure the skills provision is in place to realise, and benefit from, this opportunity. The ambition is for the space sector to become a leader for STEM learning. Initiatives including the National Space Skills Institute, the National Space Partnership, and the Skills Advisory Panel are all working to pool the sectors capability and breath of material to make it accessible to pre-16, post-16, graduates, and the existing workforce. Through Harwell, currently Europe's largest space cluster, The Space Skills Factory concept is being developed. Whilst in its infancy we are engaging with partners so that, through the Westcott Space Skills Working Group, we can integrate the work already taking place into skills and learning opportunities at Westcott and across Buckinghamshire and the wider region, including the Arc.

<sup>15</sup> <https://www.liebertpub.com/doi/abs/10.1089/space.2017.0028>

<sup>16</sup> <https://www.cnn.com/2019/12/14/spacex-oneweb-and-amazon-to-launch-thousands-more-satellites-in-2020s.html>

<sup>17</sup> <https://spacenews.com/analysis-are-smallsats-entering-the-maturity-stage/http://www.euroconsult-ec.com/research/smallsats-2018-brochure.pdf>

<sup>18</sup> [http://www.nsr.com/upload/presentations/NSR\\_Webinar\\_In-Orbit-Servicing\\_July\\_2018.pdf](http://www.nsr.com/upload/presentations/NSR_Webinar_In-Orbit-Servicing_July_2018.pdf)

<sup>19</sup> Source: London Economics - [Size and Health of the UK Space Industry 2020](#).



**A regional ecosystem for the Space Sector – DISC as a gateway**

To succeed in the global economy, Britain must build on its strengths. The corridor connecting Cambridge, Milton Keynes and Oxford is the UK's Silicon Valley – a world renowned centre for science, technology, and innovation.

An estimated 419,000 people across the corridor are employed in the knowledge economy. The corridor competes with locations across the globe, such as Boston or San Francisco Bay Area in the US, or Singapore and China in East Asia, to attract talent and investment. The opportunity for this region and the UK space sector is in the strong links and short distances (often co-location) between demand and supply, including end customers, launch partners and suppliers. **Appendix 8 (DISC.A08.01):** "From the Digital Economy to In-Space Robotics, A strategy for space-enabled inclusive UK growth driven from the Cambridge – Milton Keynes – Oxford Arc", provides more information on how DISC can support the wider ambition for a space-enabled economy.

**Westcott is a pillar of Buckinghamshire's Local Industrial Strategy****Ideas – Buckinghamshire: a 'Living Lab' and the home to new innovation**

DISC at Harwell has shown us that the model we have developed is attracting businesses and inward investment. Establishing a DISC at Westcott, as a driver for the wider Westcott Space Innovation Business Park, allows businesses to develop, refine and prove their ideas. In doing so it will deliver against national, regional, and local ambition. The focus on satellites and propulsion can contribute to many of the ambitions that have been set out by Government and presented here:

The UK Space Agency LaunchUK Initiative<sup>20</sup>: "*New technology is reducing the cost of access to space and there is an exciting opportunity for the UK to thrive in the new space age...Market research reveals that the UK could complete in a high-value market to launch an estimated 2,000 satellites by 2030.*"

The Ministry of Housing, Communities and Local Government's 'The Oxford to Cambridge Arc' summary<sup>21</sup> from 2019 states: "*Building on the strengths in individual parts of the Arc, especially in science, technology and high value manufacturing, there is the long-term potential to transform the Arc as a whole into a world-leading economic area, acting as a testbed for innovation.*"

**People – A skills and inspiration revolution**

The Buckinghamshire Local Skills Report 2021<sup>22</sup> states "*Buckinghamshire employers were more likely than average to report difficulties filling vacancies due to applicants lacking the required skills (28%) and due to not enough people being interested in the role (25%).*"

New jobs generated through DISC will create new opportunities for employment in Buckinghamshire. However, we need to work with the LEP and its partners to address this skills challenge if we are going to make the Westcott Space Innovation Business Park a success. The DISC investment will allow us to further develop a place-focused careers plan to support getting more residents into skilled work. A high proportion of these will be high-skilled, and it will create opportunities for school leavers, those looking to retrain, or those choosing vocational learning pathways. Skills at DISC will be a crucial facilitator of this ambition. As shown in response to 1.1.3 this links directly into Buckinghamshire LEPs ambition whilst also complementing other policies and views.

Size and Health of the UK Space Industry 2020 (UK Space Agency and London Economic) indicates: "*Labour productivity is 2.6 x greater than the UK average.*"

Budget Policy Paper (from 9 March 2020) 2.20: "*The Government remains committed to the major development proposals for the OxCam Arc – new transport links and urban development to create over 1m new houses and 1m new jobs. This will mean doubling of the population and housing stock in the areas by 2050.*"

<sup>20</sup> <https://www.gov.uk/guidance/how-we-are-promoting-and-regulating-spaceflight-from-the-uk>

<sup>21</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/799993/OxCam\\_Arc\\_Ambition.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/799993/OxCam_Arc_Ambition.pdf) p7

<sup>22</sup> <https://www.buckstvlp.co.uk/wp-content/uploads/2021/03/Buckinghamshire-Local-Skills-Report-2021-1.pdf>, p9

**Infrastructure: Buckinghamshire's Digital Super-Highway**

DISC provides much needed infrastructure to the local economy. Its disruptive nature also allows it to be used as a model that can be replicated elsewhere in the UK, driving economic and manufacturing innovation, led from the world-class platform of the ARC.

Savills 'The Oxford-Cambridge Innovation Arc'<sup>23</sup> highlights the need: *"To deliver an additional 3.9m sqft of office/R&D floorspace in the next 10 years. Longer-term, by 2050, there will be a need for 9.6m sqft."* The report continues with *'employment land supply is not responding quickly enough to meet the needs for land which would provide mechanisms for future economic growth through the Arc.'*

Westcott is seen as the ideal location to facilitate this demand, and DISC can be the mechanism to businesses to land and expand on the site. This ambition has been articulated by the LEP in their Local Industrial Strategy<sup>24</sup>: *"Westcott's capabilities and site designation mean that it is particularly well-suited to higher level specialist production, technology readiness level testing and demonstration activities. A significant opportunity exists for a distinct offer in relation to launch, 5G and in-orbit services."*

**Business Environment – Capitalising on scale-up potential and turbo charging Buckinghamshire's entrepreneurial businesses**

The DISC facility at Westcott will help realise the ambition of the LEP, the Enterprise Zone, and the Westcott Space Cluster. *'In Buckinghamshire, one of the major opportunities to stimulate growth stems from 'locking-in' the value of potential growth into the locality by improving the connectivity between targeted opportunities and local supply chains (using a well-established model of local wealth creation).'*<sup>25</sup> To sustain our current status as hosting the largest space cluster in Europe, we need to design, develop and deliver the ecosystem that attracts business.

DISC, being unique in the marketplace, creates that interest and pull and is a concept that other UK regions are expressing interest in for downstream (Energy / Health / Agritech / Maritime / Transport etc) applications to help grow their local economy. We need to continue to demonstrate our innovative thinking and capacity to deliver continued success.

What will set Westcott apart is its strengths in upstream space, test and verification, and also being home to the UK Space Agency's National Space Propulsion Test Facility

**PLACE - Maximising Buckinghamshire's geography to mobilise internationally significant economic assets.**

DISC supports the ambition set-out regarding the importance of Place within Buckinghamshire's Local Industrial Strategy "The actions have a core place focus and intend to use the planned major development in Buckinghamshire as a platform for testing, applying and commercialising ideas and innovations." It creates a relatively low cost, low risk option for companies who are driving new and innovative products and services. This is at the heart of our role as a Catapult – 'Innovating for a better world, empowered by satellites.' It is doing this by allowing established and maturing, larger and small enterprises to work together in a way that is flexible and sustainable.

**1.2.4 Links to other projects**

This investment in DISC R&D and skills will see the completion of Phase 1, set out in the Westcott 10 Year Vision. Investment to-date has allowed us to

- Develop a Future Networks Development Centre, Incubation Centre, and the Innovation Centre
- Plan and initiate two market-focused Living Labs (Health and Agritech) and a Drone Test and Development Centre (DTDC).

Once established, this investment will generate the demand for Phase 2 and the beginning of the commercial step-out facilities that will support the sustained growth of this site for the space sector.

<sup>23</sup> <https://pdf.euro.savills.co.uk/residential---other/report---the-oxford-cambridge-innovation-arc.pdf>, pages 1 and 6.

<sup>24</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/818874/Buckinghamshire\\_SINGLE\\_PAGE.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/818874/Buckinghamshire_SINGLE_PAGE.pdf) p22

<sup>25</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/818874/Buckinghamshire\\_SINGLE\\_PAGE.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/818874/Buckinghamshire_SINGLE_PAGE.pdf), p46

DISC @ Harwell is being pursued in partnership with OxLEP; this project includes two parts, at upstream new DISC facilities, and a second Robotics and AI facility in partnership with Oxford University.

### 1.3 Project benefits

#### 1.3.1 Logic model

The Logic Model for DISC has been included in **Appendix 9 (DISC.A09.01)**

#### 1.3.2 Evidence of what works

DISC is proven in Harwell. Providing facilities and capabilities that Industry cannot afford, or requires for limited periods when creating new systems, services and applications is essential to enable the companies to de-risk and prove their concepts.

The Catapult's model of long-term building rentals (under fully commercial terms) provides key infrastructure and capabilities required by the space and related high-tech industry. Alongside these physical assets, we know that the offer of technical, financial, and business expertise is popular and well received.

Industry confirm that the suite of support provided by the Catapult allows organisations to have a more sustainable chance of success. The combination of short-term contracts, different types of equipment on varying contracts, and different types of expertise at different stages all help these businesses to upskill their staff and ensure that all barriers to market are overcome.

We have experience of bringing together large primes and SMEs to create a unique proposition: inward investment, growth of SMEs, with sustainable and scalable services to new markets.

#### 1.3.3 Equality impact

The Westcott Venture Park itself is one of the three strategic assets of the Aylesbury Vale Enterprise Zone. There is a significant focus, reinforced in the wider Buckinghamshire LEP Local Industrial Strategy, for the sustainable growth of Westcott to benefit all residents, including those who might otherwise experience barriers to skills, education, or work.

To be successful we need a skilled and engaged workforce. It is the people and communities living in the local area who will be critical to future success. The Westcott Space Skills Working Group will identify and create opportunities for skills development, job creation and the longer-term health and wellbeing benefits. For example:

- Using the Buckinghamshire Local Skills Report 2021, we are evolving our thinking on the pre-16 outreach and engagement to school-age students, the T Level and Apprenticeship offerings, and how DISC and the wider park can provide apprenticeships, return to work schemes, and reskilling opportunities
- By co-locating the DISC R&D with the skills provision we will create an environment that better prepares learners for the world of work, is a more natural environment for post-16 and mature students to come together and make both functions the central point of the ecosystem to support broader business skills development and networking potential.
- Our ambition is to protect the rural and green feel of Westcott. As the Space Innovation Business Park evolves it will retain its ambition for green transport infrastructure, access to nature, and access to the site that mitigates potential for transport poverty.

As tenants take up residence at DISC they will be encouraged, and in some instances expected, to play an active part in creating social wellbeing opportunities to neighbouring communities.

### 1.3.4 Environmental impact

PATRIZIA will take responsibility for developing the master plan for the park, the need for which has been highlighted by the Aylesbury Vale Planning Officers. There is already a well-developed ecological enhancement and mitigation strategy in place for the site covering habitats (mainly newts owls / bats / wildlife / landscape management, tree planting etc.,) and long-term management plans for surface water which includes swales attenuation ponds.

The Westcott Venture Park have just started submitting Net Gain Biodiversity Calculations and Construction Environment Management Plans.

The Master Plan will be completed after this FBC has been awarded resources and will include details of landscaping, environmental protection, and enhancement planning. This will guide how each building in the park will help to have a positive impact on the landscape, its natural tenants, and their new human neighbours. As part of the Master Plan that will be developed for Westcott Venture Park, various works will be undertaken to ensure all buildings and development safeguard the environmental assets on site:

1. **Arboriculture Survey** – This will allow development to retain trees where possible, plan new planting and integrate these areas into the development. It will also be a health check on the existing treescape to see which trees are flourishing in the area, which need help or are not suitable and where species that are important to insects, birds and mammals are missing from the overall mix. Modern planning guidelines advise the use of trees to act as screens to not only manage the visual aspects of the project but to help manage solar gain and provide outdoor 'rooms' to encourage people to spend time outdoors working, socialising and relaxing.
2. **Habitat Survey** – Along with the Arboriculture survey this piece of work will identify the extent and range of wildlife that is already present at Westcott Venture Park. It will identify where these species reside, where they hunt or forage and how the development and construction of this building will need to be managed to prevent any negative impacts from this project.
3. **Stormwater strategy** – As we know, the management of storm (rain) water it is becoming more central to our thinking when discussing large and small developments throughout the world. Storms that were once described as one in a hundred-year events are now being reclassified as one in ten-year events. This means that the development will incorporate a comprehensive strategy for the management of stormwater. This strategy will link into the site-wide strategy of utilising passive techniques to manage stormwater wherever possible through the use of stormwater attenuation tanks, ponds, lakes and the use of the planting and soft landscaping to reduce the release of stormwater outside of the site. We also intend to investigate rain water harvesting systems and green roofs where appropriate.
4. **Environmental Impact Assessment** – The above surveys and the subsequent design they feed into will allow an Environmental Impact Assessment to be undertaken and submitted alongside the planning application to the local planning authority for approval. This will highlight our commitment to a 'net environmental gain' for the development. As the park is currently maintained as relatively low-quality grassland which provides limited habitat, it is felt that this building can have a positive impact on the site and surrounding area.

Westcott Venture Park already houses a large solar array farm, and this is being further developed by PATRIZIA, along with developments in power storage systems that will help the park to become increasingly self-sufficient in terms of power use and will help reduce the impact of the building in terms of power consumption.

## 1.4 Constraints and dependencies

### 1.4.1 Constraints and barriers to change

Based on the collaborative working and dialogue with local stakeholders, we are confident that, through the Westcott Space Board, Westcott will be a Strategic pillar for Buckinghamshire. We do recognise that the current COVID-19 crisis is taking priority, and rightly so, but we believe:

- That DISC is a much-needed national asset that will contribute significantly to the UK's economic growth beyond the pandemic.
- Any changes in working practice, e.g., increased remote working, will not significantly impact the DISC building design or function since its primary role is to house specialist equipment to enable advanced manufacturing of satellite-related prototypes. As such, the use of these facilities will always require a physical presence, albeit with appropriate precautions as appropriate. Clean rooms and labs naturally provide a COVID-19 safe working environment for users.
- Recent events including the Space Expo<sup>26</sup> at Westcott in July 2021 show there is an appetite for the activity and networking potential of Westcott. The agenda saw 14 businesses actively contribute to panel discussions, and we had 8 SMEs exhibiting to delegates throughout the day.

We are in the privileged position of having recent experience of developing a DISC facility in Harwell (Oxfordshire) and the Innovation Centre at Westcott, and we have put in place appropriate protocols to ensure that these can be used safely during the pandemic. They have also provided us with the insights to ensure we have an effective risk management strategy in place overall to identify, mitigate and/or remove potential barriers. Examples we have identified include:

- Infrastructure improvements for site access due to increased traffic. To meet policy guidelines for the (now constructed) Innovation Centre a new access roundabout on the A40 between Aylesbury and Bicester has just been completed
- The design, build and fit out schedule is expected to complete 24 months from grant receipt
- Now the UK has withdrawn from the EU, relevant policies and regulations may change requiring activities to be adjusted and considered in-line with the project delivery and revised guidelines.

In all instances, the Catapult will follow public procurement rules and ensure that the Subsidy Control policies that have replaced the EU state aid regime are adhered to.

#### 1.4.2 Dependencies

The delivery of the DISC is dependent on the funding received, and the timescales associated with contract award. The project timescales are ambitious but can be achieved in partnership with BLEP.

The construction of the building itself will be completed by the onsite Landlord (PATRIZIA). This part of the project is not funded by Government. However, the Catapult will not enter into a lease until the funding for equipment is confirmed. The primary dependency is to provide the facility in a timely manner so fit-out and integration can be completed.

The Catapult's responsibility for the equipment procurement, design and infrastructure requirements will be discharged in parallel with the build of the facility so as to be ready for the integration of the equipment once the building is ready. Completing the project in this manner means that the project can be expedited. The equipment budget includes provision for installing the key infrastructure that the facilities / capabilities require. Planning delays may affect the timescales /delivery of this project.

#### 1.4.3 If there are specific constraints on the project's start / end dates, please state these below

	Date	Details
Project construction cannot start before funding is confirmed	May 2022	Catapult is not able to commit to long-term leases with the Westcott Landlord until funding is secured.
Project must be completed by	September 2024	To ensure we do not lose momentum and the demand that is building, we must provide facilities before organisations decide to move this type of operation to another country.

<sup>26</sup> <https://westcottexpo.co.uk/>



## 2. Economic Case

This section sets out four options for developing a Disruptive Innovation for Space Centre (DISC) at Westcott, with or without a Skills Academy:

### **Reference Case - Option 1 – Do nothing**

Under this scenario, no DISC will be constructed. The momentum to provide key facilities at Westcott would be lost. While the Catapult will continue to work with partners to develop additional capability at both Westcott and Harwell, the ambition will be heavily constrained and industry needs will not be met. The unique environment at Westcott for secure testing and verification of potentially hazardous products will not be fully exploited and the expansion potential for manufacturing to meet the growth needs of the Space sector will not be realised.

### **Option 2 - DISC Innovation Capability with Skills Provision – (2,000 sqm Skills and 4,000 sqm R&D Innovation)**

Construction of:

- A 4,000sqm dual-purpose R&D facility, equipped to support (i) prototype development of small satellites, payloads, and propulsion systems for upstream applications, (ii) product and service prototypes for downstream applications in Health and Agritech - **Appendix 7 Case Studies (DISC.A07.01)**
- A 2,000sqm Skills Academy to facilitate industry access to fill the skills gap with new talent thorough apprenticeship and training programmes. **Appendix 11 Skills Overview (DISC.A11.01).**

### **Option 3 – DISC without Skills provision (4,000 sqm)**

Construction of a dual-purpose R&D facility, equipped to support (i) prototype development of small satellites, payloads, and propulsion systems for upstream applications, (ii) product and service prototypes for downstream applications in Health and Agritech.

### **Option 4 – Larger DISC facility, without Skills provision (6,000 sqm)**

Relative to Option 3, it includes an additional 2,000 sqm, to provide a more flexible and adaptive work environment to accommodate larger-scale collaborations between end users, industry, and academia.

#### 2.1 Critical success factors

1. **Inward investment:** DISC fulfils an immediate requirement for companies entering the UK space sector who want to access specialist equipment and manufacturing facilities without the heavy cost of ownership. Instead, users can rent cleanrooms, test chambers, assembly rigs and other equipment on a needs basis at commercial rates, until design concepts are proven and ready for production. In one stroke, DISC lowers the entry barrier to market and creates a level playing field for UK based companies who want to collaborate and create new products, applications, or services for this exciting and fast-moving sector.
2. **End-to-end capability:** DISC acts as a focal point for industry to design and development prototype products and services in collaboration with other parties. The operating environment enables different companies to work on large-scale projects so that multiple products or sub-systems can be integrated into larger system designs. In this way, DISC provides an ideal environment for new and existing space sector companies to establish end-to-end supply-chain capability for the next generation of space sector products and services. The Lockheed Martin Case Study provides an excellent example of this type of project - **Appendix 7 (DISC.A07.01).**
3. **Jobs and skills development:** Companies using DISC will scale operations as their early design concepts take shape and prototype products and services begin to mature. As this happens the demand for skilled resource and opportunities for training and apprenticeships will also increase. By working with regional stakeholders, the DISC operation will connect Users with Universities and schools in the area and local business. Initial activity will be informed by the

2021 Buckinghamshire Local Skills Report. However, as the facility becomes established, we are confident it will contribute to reducing the challenges currently identified.

4. **Catalyst for growth:** DISC at Westcott enables companies to prepare their products and services for commercialisation. To exploit this opportunity and retain business in the region, Westcott will need to create purpose-built production centres to facilitate transition from DISC to production and retain essential capability in the region/UK. By introducing the skills provision into the DISC and multiple production centres (10), Westcott can help school leavers into T Levels, Apprenticeships, and the workplace. **This ambition is set out in the [Westcott 10 Year Vision document produced in 2019](#).**

In summary DISC, both the R&D facilities and the Skills Academy, will create:

- 1,593 employment opportunities across Buckinghamshire and the Arc (900 direct, 693 indirect)
- Access to an environment that allows companies to move from concept to prototype by making specialist facilities accessible and affordable, prove new concepts, overcome barriers, and spin out / scale up into their own buildings / centres
- Skills opportunities through T Levels / Apprenticeships, retraining those seeking a career change and upskilling existing workers to exploit the latest equipment and techniques. More importantly, in helping create new products and solutions, specifically in high-value manufacturing, DISC will create the longer-term demand for highly skilled technical jobs and support functions in Buckinghamshire and the UK
- Networks / Coordination by bringing new businesses (either start-ups or inward investment) to the established and growing space ecosystem at Westcott.

**Definition: DISC encompasses:**



The '**R&D**' facilities for industry to innovate, design, manufacture and prototype new products and services



The '**Skills Academy**' that provides development and learning opportunities (e.g., T Levels, Apprenticeships, and Continuing Professional Development (CPD)).

The specification of DISC, which is specifically for advanced manufacturing, means that any post COVID-19 change in working practices will be minimal. Unlike traditional office space, which may see a decrease in demand, DISC requires working practice that cannot be done remotely or at home. Clean rooms and labs etc. provide a COVID-19 safe working environment for their users.

The Catapult-led Harwell operation already demonstrates the ability of DISC to attract inward investment from international companies wanting to utilise the UK's innovation manufacturing landscape. A delay, or deferment in the investment decision will hand the initiative back to our international competitors.

A recent Saville's report 'The Oxford-Cambridge Innovation Arc: One of the greatest opportunities for Economic growth in Europe?'<sup>27</sup> highlights the need 'to deliver an additional 3.9m sqft of office/R&D floorspace in the next 10 years. Longer-term, by 2050, there will be a need for 9.6m sqft. The report continues with 'employment land supply is not responding quickly enough to meet the needs for land which would provide mechanisms for future economic growth through the Arc'

Our ambition for DISC and the wider Space Innovation Business Park at Westcott, is to create an ecosystem that ensures UK space sector assets transform R&D capability into products and services that can be scaled for commercialisation on the international stage. This ambition is reflected in Buckinghamshire LEP's Local Industrial Strategy: 'This Local Industrial Strategy sets out how partners will take the [Westcott space] cluster to the next level, by working with businesses to address skills shortages for technicians and propulsion test specialists and developing a long-term investment plan for Westcott to develop new R&D infrastructure and an established base for manufacturing excellence in the fields of space propulsion and in-orbit maintenance, based on working across value chains.'<sup>28</sup>

<sup>27</sup> <https://pdf.euro.savills.co.uk/residential---other/report---the-oxford-cambridge-innovation-arc.pdf>, pages 1 and 6.

<sup>28</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/818874/Buckinghamshire\\_SINGLE\\_PAGE.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/818874/Buckinghamshire_SINGLE_PAGE.pdf), p7

## 2.2 Options appraisal – longlist

### 2.2.1 Longlist of options

The long list (**Appendix 2**) is summarised as follows:

The Propulsion cluster is already formed and growing at Westcott.

Building upon the investment at Westcott, DISC will create a facility to ensure these businesses adapt, grow, and develop further systems, services, and applications. Once these solutions are operationalised, we expect the organisations to grow; either in their original location, or across the UK (where it is most appropriate for them to do so). Thus, this facility will benefit the whole of the UK.

#### **Option 1 - Reference case/ Do-nothing**

Do nothing. Based on our deadweight calculation this would see roughly 20% of work happening in the absence of intervention, but with a significant likelihood of these operations, which could be performed in the UK, instead being established overseas.

#### **Advantages**

None

#### **Disadvantages**

Overseas competitors have replicated many of the Catapult's initiatives already, including our own operational model. Failure to invest will see international industry who require DISC return to their domestic markets and hand the initiative back to our international competitors as DISC knowledge is transferred.

#### **Outputs / outcomes**

UK space sector fails to inject the pace required to deliver our regional growth agenda for the UK. This will adversely impact the Westcott SIBP £1.9bn NPV by 2030 and makes the target unachievable within this time frame.

#### **Reason for rejection**

Loss of opportunity and inability to secure alternative funds that deliver project objectives.

#### **Option 2 - DISC with Skills provision 6,000sqm (4,000sqm DISC R&D and 2,000 sqm Skills Academy)**

Option 2 provides a 6,000sqm dual purpose facility furnished with state-of-the-art equipment:

- 4,000sqm DISC R&D facilities that accommodate innovation in both upstream (technology development) and downstream (market readiness) capability. The Centre will accommodate multiple business supply-chains
- 2,000sqm Skills Academy that will support T Level and Apprenticeships, reskilling, and upskilling of workforce(s).

The capability developed at DISC will contribute significantly toward the UK's ambition of commercialising space and the downstream markets this fast-moving sector continues to serve. In addition, the adjacency of the skills provision within DISC will support the growth of specialist talent and skills to build the workforce of the future and ensure that the products and services produced can be manufactured in the UK. Together these two facilities will contribute to keeping the UK at the forefront of innovation to exploit an exciting post COVID-19-lockdown growth opportunity.

With a predicted 1,593 jobs created over the life of the facility, users of the facility will not remain in the centre long-term; they will bring new ideas / prototype, prove, and move into full production centres.

The addition of a predicted 1,465<sup>29</sup> qualified T Level and Apprenticeship students will provide the sustainable workforce growth required as the businesses move from DISC and establish these production centres.

Government investment is a one-off contribution to help mobilise and establish DISC at the start of the wider Westcott SIBP ambition. Commercial revenues generated by the DISC are used to reinvest in its upkeep and refurbishing with new equipment to ensure it remains at the forefront of innovation

### **Advantages**

- Very High BCR of 4.38:1
- Highest NPV per pound of public expenditure (£13.43)
- Highest NPV per pound of total economic cost (£ 2.51)
- £387m Net Present Value
- 1,465 T Level (Level 3) and Apprenticeship (Level 4) qualifications secured
- 470 Continuing Professional development opportunities created
- Neutral environment for the collaboration and formation of new supply-chains
- Potential to integrate end-users' requirements into design and development
- Similar thematic capabilities geared towards the acceleration of innovation
- Testing of disruptive ideas and technologies
- Rapid manufacture and iteration of prototype products.

### **Disadvantages** (compared to option 3)

- Physical size restrictions may hamper capacity to provide a more flexible and adaptive work environment for accommodating larger-scale collaborations between end users, industry, and academia.

### **Outputs / outcomes**

- Employment opportunities for 1,593 people across Buckinghamshire and the ARC
- Stimulation of large-scale production opportunities at Westcott attracting further commercial investment for a £1.9bn Space Innovation Business Park (SIBP OBC)
- A state-of-the art training facility for 16+ with an expected annual footfall of approximately 460 learners by the end of year 5
- Stimulation of other innovation opportunities at Westcott for AI and Robotics, Drones Health and Agritech requiring further investment for a SIBP.

### **Reason for rejection**

- None.

### **Option 3 – DISC without Skills Academy (4,000 sqm)**

Represents an option including 4,000 of DISC R&D space but excluding skills.

A 4,000sqm DISC that accommodates innovation in both upstream (technology development) and downstream (market readiness) capability. The Centre will accommodate multiple business supply-chains. The capability developed at DISC will contribute significantly toward the UK's ambition of commercialising space and the downstream markets this fast-moving sector continues to serve.

Furnished with state-of-the-art equipment, the centre will accommodate a wider range of multiple business supply-chains to create a 4.30:1 BCR. The capability developed at DISC will contribute toward the UK's ambition of commercialising space and the downstream markets this fast-moving sector continues to serve; all the time keeping the UK at the forefront of innovation to exploit an exciting post COVID-19 lockdown growth opportunity.

<sup>29</sup> Assumed over 18 years

**Advantages**

- Very High BCR of 4.30:1
- Net Present Value of £224m
- Expansive environment for flexible and adaptive working on larger-scale collaborations
- Volume of spinouts and advanced TRLs for regional universities (i.e., Arc's University Group)

**Disadvantages**

- Level of investment and Benefit-to-cost ratio compares less favourably to option 2
- Risk of not securing the necessary trained/skilled future workforce needed to sustainably support the growth of the business using DISC as they step out into their own facilities, threatening the establishment of the Space Innovation Business Park at Westcott and the considerable spillover benefits to the UK if manufacturing has to move abroad because of lack of skilled workers.
- Lost manufacturing and engineering skills for young people, retainers, and upskilling.

**Outputs / outcomes**

- Employment opportunities for 890 people across Buckinghamshire and the ARC
- Stimulation of large-scale production opportunities at Westcott attracting further commercial investment for a Space Innovation Business Park (SIBP)
- Stimulation of other innovation opportunities at Westcott for AI and Robotics, Drones Health and Agritech requiring further investment.

**Reason for rejection**

- Whilst the DISC offering remains the same, the loss of skills risks the long-term sustainability of businesses at Westcott (due to lack of skilled workforce) and erodes the potential for spillover benefits from the DISC operation if the products and services generated cannot be commercialised in the UK. In addition, it denies the opportunity to support local Place initiatives and social return on investment due to a lack of provision for skills and for removing barriers to employment.

**Option 4 - Larger DISC facility without skills (6,000 sqm)**

Represents the maximum investment developing a larger-scale 6,000sqm facility (upstream/downstream) furnished with state-of-the-art equipment. The centre will accommodate a wider range of multiple business supply-chains.

**Advantages**

- Very High BCR of 4.30:1
- Net Present Value of £448m
- Greater volume of user throughput, providing more production and commercialisation opportunities
- Expansive environment for flexible and adaptive working on larger-scale collaborations
- Higher levels of employment (780 jobs) and upskilling and training of workers
- Improved breadth and depth of facility services and demonstration labs
- Volume of spinouts and advanced TRLs for regional universities (i.e., Arc's University Group).

**Disadvantages**

- Level of investment and Benefit-to-cost ratio compares less favourably to Option 2
- Risk of not securing the necessary trained/skilled future workforce needed to sustainably support the growth of the business using DISC as they step out into their own facilities. This threatens the establishment of the Space Innovation Business Park at Westcott and the considerable spillover benefits to the UK if manufacturing has to move abroad because of lack of skilled workers.



- Lost manufacturing and engineering skills for young people, retainers and upskilling as the number of opportunities for skills and apprenticeships are decreased.
- Lower affordability, compared to Option 2.

### Outputs / outcomes

- Employment opportunities for 1,780 people across Buckinghamshire and the Arc
- Stimulation of production opportunities at Westcott, but without sufficient “pull through” demand, production may occur elsewhere and not in the UK.

### Reason for rejection

- Whilst the outcomes and achievements are very high, we do not believe that this project will be affordable. We have included it as an option in the shortlist, however it is not presented as the preferred option / way forward. As with Option 3, the loss of skills risks the long-term sustainability of businesses at Westcott (due to lack of skilled workforce) and erodes the potential for spillover benefits from the DISC operation if the products and services generated cannot be commercialised in the UK. In addition, it denies the opportunity to support local Place initiatives and social return on investment due to a lack of provision for skills and for removing barriers to employment.

## 2.2.2 Options shortlisting

The process for options shortlisting has been completed with the Buckinghamshire LEP.

The Catapult’s preferred option is to fit out a new build facility of 6,000sqm that includes the 4,000sqm R&D facility and 2,000sqm skills provision. This is based on the existing and future demand for capabilities integrated within the facility (£30m).

Collectively the Westcott Space Board (detailed in B.4 of this document) set out the vision, mission and ambition for the Westcott Space Ecosystem, and this fed into the LEP’s development of Buckinghamshire’s Local Industrial Strategy. The strategy defines 6 gates in translating this ambition. Investment to-date has seen work either completed or start on the first three phases. This investment will allow us to turn gate 4 (Phase 1b) into an occupied DISC facility, and the arrival of the first cohort of T Level and Apprentices, and annual training programme for businesses:

1. Planning
2. Positioning
3. Phase 1a (Complete or in progress – Innovation Centre, 5G Step-out Centre)
4. **Phase 1b (DISC R&D and Skills)**
5. Phase 2 Step-out Facilities
6. Phase 3 Advanced / Specialist step-out facilities

To reach this point our focus has been on the first four areas:

- **Planning** how to approach development of the Westcott site and order of priority
- **Positioning** how to align with the Local Industrial Strategy and wider Arc strategy
- **Phase 1** providing capability and demand through smaller, specialist facilities, securing occupants and the impact of our endeavours.
- **Phase 2** identifying DISC as a critical enabler for cluster development, attracting inward investment and acting as a genesis for establishing product / service production on site, and understanding and defining the skills requirements that will support DISC, Westcott and the Space Innovation Business Park ambition

To inform the shortlisting process, and following the launch of Buckinghamshire’s Local Industrial Strategy in July 2020, we have completed the following activities:

Date	Activity	Output
August – September 2019	Created an Outline Business Case for DISC at Westcott	Buckinghamshire LEP shared the business case with Central Government
November – December 2019	Used feedback from Government to develop the methodology to inform the DISC business case and also the wider Westcott Space Ecosystem. In parallel our engagement with industry for the facility at Harwell in Oxfordshire, informed the priority areas, appetite and demand for the facility at Westcott	Clarity on areas of prioritisation from Central Government and the market that was shared and discussed with the Westcott Space Panel. The next steps agreed were to create a 10-Year Vision for Westcott.
January – February 2020	Created a Westcott Strategic Vision Space Innovation Business Park 10-Year Plan. This document defined the ambition of the site, over three phases; DISC was identified as the critical enabler and a priority for Phase 1.	Shared the document with the wider Westcott Space Panel Sought feedback from members on the contents of the plan, refining them to inform the options appraisal, shortlisting process and next steps
May – September 2021	Develop the Final Business Case for DISC at Westcott to agreed shortlisting requirements.	DISC (R&D and skills) Final Business Case submitted to Buckinghamshire LEP DISC informed the Westcott Space Ecosystem Outline Business Case

The methodology for shortlisting the options were:

1. Evidence of demand for a DISC facility at Westcott based on market intelligence – potential customers engaged and their ambitions, please see Industry case studies in **Annex 7 (DISC.A07.01)**
2. Understanding what Skills in DISC and the pathway to careers, please see **Skills Overview in Annex 13 (DISC.A11.01)**
3. DISC's ability to leverage the historical legacy of the site (rocket propulsion) and exploit the wider and launch and in-orbit services agenda for upstream and downstream applications including drone technology, and living labs for Health and AgriTech
4. Alignment to the Buckinghamshire and Arc Local Industrial Strategies as a catalyst for growth
5. Socio-economic benefit realisation to local businesses and residents
6. The potential for inward investment to Buckinghamshire and the region
7. Sustainability of the solution including:
  - a. Health and wellbeing, and green travel options
  - b. The longevity of the site to ensure it delivers a return on investment to the UK economy
  - c. Building materials and standards.

Following the impact of COVID-19 we have revisited the approach to ensure that the request for investment is still applicable and relevant post lockdown. Given the specialist advanced manufacturing environment that DISC provides, this investment takes on greater urgency and importance as a vehicle for creating jobs and accelerating industry product and service development.

## 2.3 Options appraisal – short list

### 2.3.1 Cost-benefit analysis

This section presents a Cost Benefit Analysis highlighting the key economic effects expected because of each shortlisted intervention option. This assessment focuses on the time period 2020/21-2039/40, which represents 15 years from the beginning of operations in 2024/25.

This intervention is expected to have benefits going far beyond the standard 10-year period, which is why a 15-year time period was used. The majority of beneficiaries will be young people, and we therefore expect the benefits to accrue throughout their working lives, so that this is a likely underestimation of the total net present value of the benefits. These benefits on the level of the upskilled individual are also of non-temporary nature, as the average wage increase resulting from a skills uplift is of persistent nature across many years.

In addition, the building is expected to be operational and delivering benefits for many years past the 15-year mark, as with other education and lab-space, there is no definitive end-date. These options were appraised using Green Book Guidance and resorting to evidence-based assumptions laid out in this section and in Section 2.3.2.

We present the options in numerical order, with Option 2 i.e., the preferred option being the one that details all the steps involved in deriving the main outputs of this analysis.

Importantly, all the prices on this section are provided in real 2021/22 terms and have been discounted, using a UK Green Book discount factor of 3.5%, which is why they might not correspond to nominal values presented elsewhere in the document.

#### Option 1 - Reference case (do nothing)

The following formula was used to derive the net additional impact

$$AI = [GI \times (1 - L) \times (1 - Dp) \times (1 - S)] - [\alpha GI' \times (1 - L') \times (1 - Dp') \times (1 - S')] ]$$

Where:

- AI= Net additional impact; GI= Gross impact; L=Leakage; Dp= Displacement; S=Substitution.
- The apostrophe denotes the reference case and hence deadweight.
- $\alpha$  corresponds to the proportion of the gross impact of the reference over the gross impact of option 2, so that  $\alpha = GI'/GI$ .

The  $\alpha$  equals approximately 23% and it is derived based on the assumed rates of Leakage, Displacement and Substitution, outlined in the next section of option 2, as well as a deadweight factor of 39.5%. This latter value corresponds to the sub-regional level of deadweight from the HCA additionality guide (2014). However, this is a very prudent approach since the nature of this intervention provides a low deadweight, because of the lack of incentives for individual businesses to leverage enough funding and channel sufficient resources to establish a similar facility, with the same scale and expected impacts as DISC.

The Gross Impact of the reference case corresponds to approximately £125m and the net additional, after the assumed rates of Leakage, Displacement and Substitution equals £99m. This corresponds to the expected net benefits in the absence of intervention.

In this reference case, it would be expected that smaller alternative facilities and capability may be scattered across the UK and for these to only be able to address a significantly smaller demand for some of the capability offered by DISC. Moreover, lack of coordination between companies, asymmetric information, and free rider problems to fund information-sharing events and fora result in a smaller network of organisations and individuals that allow spillovers to flow to and from. The Catapult-led collaboration efforts allows for de-risking by tackling information asymmetries: conveying to businesses the benefits of using DISC and expanding operations in the UK, as opposed to overseas. Without the inclusion of the Skills Academy provision there is a risk that the absence of

intervention will result in not having the depth and quantify of skilled workers to meet business demand. This may risk the attractiveness of Westcott as a destination for UK businesses and inward investment from overseas.

It should be recognised, that any reference-case generated jobs may well end up located overseas as other countries develop their own innovation capability and attract industry away from the UK.

### **Option 2 - Preferred Case (2,000 sqm Skills Academy and 4,000 sqm DISC)**

Cost Benefit Analysis (Present Value and 2020/2021 Prices)		DISC and Skills Centre
A	Cumulative GVA from Jobs	£ 609,574,742
B	Private Costs (disbenefit)	£ 49,927,251
C	Skills Uplift	£ 37,019,979
D = (A+C)	Total Benefits	£ 646,594,721
E = D - B	Total Benefits net of Private Costs	£ 596,667,469
F = % of E	Optimism Bias (Benefits)	£ 59,666,747
G = E - F	Total Benefits Net of Private Costs (after Optimism Bias)	£ 537,000,722
H = G after accounting for the deadweight, displacement and leakage and substitution	Net Additional Benefits (after: Optimism Bias, Leakage, Displacement, Substitution, Deadweight)	£ 324,885,437
I	Public Costs	£ 30,278,287
J	OPEX	£ 68,351,400
K = % of I	Optimism Bias (Public Costs + OPEX)	£ 16,767,047
L = J + K + I	Total Public and OPEX costs (After Optimism Bias)	£ 115,396,733
M = (H/L)	Benefit Cost Ratio (BCR)	£ 2.82
N = H - L	Net Present Value (NPV)	£ 209,488,704
O = (N/I)	NPV per pound of public expenditure	£ 6.92
P = N/(I+J+B)	NPV per pound of total economic cost	£ 1.41

### **Economic Benefit of DISC**

The prime purpose of the DISC R&D facility is to allow companies to rapidly develop, test and validate new concepts ahead of the full-scale commercial production that takes place outside the DISC facility. The R&D facility in DISC is designed to accommodate the relatively small teams that are engaged in initial product development, along with the specialist machinery and facilities that will facilitate this. Given that much of this machinery has a relatively large physical footprint, we need to keep the 'density' of people within the building at any one time at a relatively low level.

Consequently, while the DISC itself will produce in-house economic activity, most directly traceable employment to DISC will be the result of additional jobs from supported companies, which require additional capacity as their products, developed at DISC, go into commercial production elsewhere.

Spillovers are also a major source of impact. Spillovers describe the effects arising from an activity that spills into third parties, without compensation being paid or received. With DISC being a breeding ground for innovation and R&D, typical of Catapult interventions where impacts are largely in the form of spillovers<sup>30</sup>, we expect spillovers to be 2 to 3 times larger than the private rate of return<sup>31</sup>. This approach is why the VfM assessment may be significantly underrepresenting the underlying benefit-category. As phrased by BEIS, by not accounting for spillovers the "impact of the Catapults will remain underestimated"<sup>32</sup>, but due to prudence and the known challenges of quantifying spillover effects, these effects are not monetised and were not quantitatively added to the Value for Money assessment. More on these spillover effects will follow further in the document.

<sup>30</sup> *An economic analysis of spillovers from programmes of technological innovation support* (2014), BIS

<sup>31</sup> *Spillovers in the space sector* (2018), London Economics

<sup>32</sup> *Catapult Programme: A framework for evaluating impact* (2017), BEIS

The DISC Skills Academy plays a vital role in enabling this level of growth by making sure adequate skills are developed and deployed to fulfil the needs of DISC enabled jobs. Without the Skills Academy, it is likely DISC Users would be forced to subcontract some supply-chain roles overseas. Over time this would accelerate job leakage from the UK, with some companies deciding to relocate operations abroad.

It should be noted that the spillover benefits of DISC are already being developed by Westcott in collaboration with other regions. In the Northeast for example, capability to support development of secure comms within the overall landscape of the UK space sector will play a vital role for DISC Users at Westcott and Innovators in the Northeast. A dialogue between the relevant LEPs and industry is already in progress to twin DISC activities across both regions.

### Monetisation of GVA from jobs created

There are three different components of the directly-supported jobs, which follow:

- 150 people to be directly employed by DISC user-companies and as a result of DISC, from 2029/30 onwards, when utilisation peaks at 80%. Of the initial 150 employees, 50 people are to be employed within DISC itself, with another 100 other related jobs being created in other locations, within the different supply chains. This is realistic and even conservative, given existing examples of current facilities, such as Zephyr (the DISC at Harwell) which have roughly as many DISC-dependent jobs elsewhere, as they have working in the facility, despite the covid-19 economic recession.
- In addition to the previous forecast, an average of approximately 60 additional jobs per year are to be created by supported companies that expand their labour force upon the start of full-scale production. As mentioned above, these companies are expected to be in new commercial facilities elsewhere, mainly on the Westcott Venture Park. This evidence-based assumption is derived from real-world experience from case studies involving Lockheed Martin, Open Cosmos, and Astroscale.
- 30 jobs expected to be filled by highly skilled professionals from the Enterprise Alliance and space sector professionals, in the following fields: operations, technical, training and marketing.
- Utilisation of DISC drives the incremental increases in attributable jobs:

2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
0%	0%	20%	50%	65%	65%	75%	80%

The occupancy rates were forecasted, as per above table: with progressive increases from 2023/24 until achieving 80% of capacity in 2029/30, with this occupancy rate forecasted to persist until 2039/40.

These occupation percentages are benchmarked against analogous Catapult facilities. They are estimated based on the proven and recorded success in attracting users and tenants for other, distinct, yet comparable Catapult-owned facilities: Zephyr (DISC) in Harwell and the Westcott Innovation Centre (WIC). More details on this forecast follow-on section 2.3.2.

Given the aforementioned evidence-based assumptions, the additional jobs estimated are forecasted as follows:

	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32
Additional Jobs	0	0	63	81	78	50	69	59	50	50

This amounts to 900 direct jobs and 8,195 job-years over the 15-year period. The indirect jobs are forecasted to sum up to 693, however for prudence, these were not considered for the overall GVA assessment.<sup>33</sup> These indirect jobs result from an increase in demand for the inputs of suppliers of supported businesses, as the latter organisations expand their operations in the UK, because of DISC and should not be confused with the spillover effects from the DISC activities.

<sup>33</sup> The indirect jobs were calculated using a Type I multiplier from *Size and Health of the UK Space Industry, 2018*.



From the above number of jobs, using the average GVA per employee ratio of approximately £145,468k, we derive the annual GVA uplift associated with industry jobs being created.<sup>34</sup> This figure is significantly higher than the average GVA for Berkshire, Buckinghamshire and Oxfordshire (TLJ1) GVA per filled job (2021) prices, of approximately £69k. However, using this latter figure would grossly underestimate the GVA from DISC-enabled space sector jobs, since regional GVA ratios that include sectoral jobs that have a substantially lower labour productivity, measured by GVA per employee. This is illustrated by the fact that space sector employees have a labour productivity 2.6 times higher than the average UK employee, which further promotes the expected benefits from this intervention, and provides strong rational for development of the sector in Buckinghamshire.<sup>35</sup>

Persistence is the length of time that benefits are expected to last for. As indicated previously, we forecast that any additional job positions filled will persist until the end of our benefits realisation period (2039/40), and so will the associated GVA.

This process allows us to derive a Cumulative GVA of £610m from jobs created. Additional details are given in Section 2.3.2. This will contribute and further promote the space sector growth trends to date: the sector continues to see year-on-year growth in GVA. The most recent Size and Health report showed that the UK space industry directly contributed £6.6bn of GVA in 2018/19, up from £6bn in 2016/17.

### Skills Uplifts

The skills uplift enabled by the skills centre was monetised by matching the types of training that will be provided with RQFs Level 3, 4 and 5.

RQF Levels	Number of students per year
2 to 3	25
3 to 4	40
4 to 5	300

The Levels 2 to 3 will be those enrolling onto the T Level course being offered. We expect the initial cohort to be circa 20 students increasing to no more than 40 over 5 years.

Level 3 to 4 will be students enrolling onto Level 4 Apprenticeships. We intend to delivery two courses initially, Manufacturing Technician, and Space Manufacturing Technician. Each course will have a cohort of 20 students. As the Skills Academy is established, rather than increase the size of the cohorts we expect to increase the Level 4 Apprenticeships we offer. Whilst we know there is an immediate need for the two courses identified, additional courses will be informed by demand within the ecosystem, and their skills gaps; for example, we may identify a need to provide an Level 4 Apprenticeship in Satellite Communication Systems.

Level 4 to 5 will be generated through the Continuing Professional Development programme we make available. It will be aimed at existing sector employees who are looking to secure a higher-level qualification, complete a model in a specific area, or be trained on specialist equipment / the latest technology. Unlike the Level 2 – 3, and 3 to 4 offerings, these courses will vary in length from 1 day, 1 week to part-time over several months. We are also intending that the DISC can provide conferencing and networking opportunities which will also contribute to the continuing professional development of industry professionals.

Resorting to data from Battiston, A., Patrignani, P., Hedges, S., & Conlon, G. (2019) and assuming equal gender parity in student access to the skills provision, and that most of the training corresponds to an “engineering” field, based on our student forecast per year up we estimate that the training would enable a cumulative £37m of benefits, by to 2039/40. Resorting to Battiston et al. we assumed a directly attributable increase in expected wages of £10.3k for each student that progressed from RQF levels 3 to 4, and 4 to 5; and of £5.5k from 2 to 3. No attributable persistency

<sup>34</sup> The GVA-to-employment ratio and productivity figure was derived from the UK Space Agency, “The Size & Health of the UK Space Industry”, Report, 2018.London Economics, January 2019, Size and Health of the UK Space Sector 2018.

<sup>35</sup> The GVA-to-employment ratio and productivity figure was derived from the UK Space Agency, “The Size & Health of the UK Space Industry”, Report, 2020. Know.space, May 2021, Size and Health of the UK Space Sector 2020.

of this enabled increase, in expected wages, was accounted for, in order to ensure a conservative estimation of these benefits.

This uplift is a result from higher expected wages for students in the field, enabled by the skills centre. This value, similarly, to the other benefits was reduced, when calculating additionality as described later on in the document. Target commitments for skills are set out in **Appendix 11 Skills Overview (DISC.A11.01)**.

### Optimism Bias (Benefits)

A 10% optimism bias was applied to the Benefits. This optimism factor adjustment was used, in line with Green Book guidance, to control for the possibility of an overly optimistic appraisal.

### Additionality

To assess the benefits that would have happened anyway in the absence of intervention, additionality was addressed by applying sub-regional factors for Leakage, Displacement, Substitution. £324m of net additional benefits are forecasted, out of £537m of gross benefits.

This was estimated as per the formula of the previous section, with:

1. Leakage: Leakage is forecasted to be at 5%, for option 2, a lower value than the mean leakage rate at the sub-regional level of 15.8% (used for DISC options without the skills centre). This occurs since the GVA benefits are expected to leak somewhat more, without a skills centre which will help guarantee optimal skill matching within the UK and within the region, so that, for instance, overseas remote jobs need to be secured alternatively. Nonetheless, only a small number of outputs/outcomes are expected to leak outside of the area of intervention, where the companies and their workers will be adding value.
2. Displacement: The Displacement has been forecasted at 17% (Catapult Evaluation)<sup>36</sup>. Nonetheless, this is conservative assumption, as given the characteristics of DISC, we expect it to draw significant resources from abroad and human capital that would otherwise settle for a competitive overseas location.
3. Substitution: Assumed to be zero. The concept of substitution is not relevant for this intervention as it does not incentivise any behaviours that could generate “within firm” displacement.

### Operational Expenditure and Capital Expenditure (Public and Private)

The operational expenditure associated with running DISC and the Skills Academy until 2039/40 equal £68.4m, whereas public capital expenditures and other fixed costs amount to £30m and private, to £50m. An optimism bias of 17% was used, an addition to the public capex cost, to allow for the potential for optimism in the costs forecast; nonetheless, this is a very cautious approach given our experience in this, having completed DISC in Harwell and the Innovation Centre at Westcott.<sup>37</sup>

### Spillover Benefits

Spillovers are expected to play a prominent role in the impact pathway, with DISC being a key disruption-generating facility with a heavy focus on innovation. Nonetheless, as previously mentioned, they are not monetised. It is worth noting that the Catapult culture and *modus operandi* incentivises the exchange of innovative ideas and cross-sector partnerships that will help ensure these externalities come to fruition, as agents currently do not fully appropriate the benefits from streamlining R&D development into full-scale production processes. These effects are expected to be particularly pronounced when having organisations working in close proximity, which has been shown to increase the size and diffusion rate of knowledge spillovers.<sup>38</sup>

<sup>36</sup> Evaluation of the Satellite Applications Catapult Final Report to Innovate UK, August (2019)

<sup>37</sup> The costs, as well as any other values in this section are at 2021/22 constant prices and are discounted at 3.5% as per Green Book guidance, so they might not match other costs elsewhere in the document.

<sup>38</sup> R. (2017). The role of spillovers in research and development expenditure in Australian industries. Jaffe, A. (1988). Demand and Supply Influences in R&D Intensity and Productivity Growth. Lychagin, S., Pinkse, J., Slade, M., Van Reenen, J. (2016) Spillovers in Space: Does Geography Matter? Bottazzi, L. and Peri, P. (2003). Innovation and spillovers in regions: Evidence from European patent data.

**Benefit Cost Ratio and Net Present Value**

Considering the monetised benefits and costs described above, DISC Option 2 will deliver a Net Present Value of £209m, with a Benefit Cost Ratio of 2.82:1.

**Option 3 – DISC without Skills (4,000 sqm)**

Cost Benefit Analysis (Present Value and 2020/2021 Prices)		DISC without Skills Centre
A	Cumulative GVA from Jobs	£ 595,945,939
B	Private Costs (disbenefit)	£ 33,284,834
C	Skills Uplift	£ 0
D = (A+C)	Total Benefits	£ 595,945,939
E = D - B	Total Benefits net of Private Costs	£ 562,661,105
F = % of E	Optimism Bias (Benefits)	£ 56,266,110
G = E-F	Total Benefits Net of Private Costs (after Optimism Bias)	£ 506,394,994
H = G after accounting for the deadweight, displacement and leakage and substitution	Net Additional Benefits (after: Optimism Bias, Leakage, Displacement, Substitution, Deadweight)	£ 271,539,657
I	Public Costs	£ 20,185,524
J	OPEX	£ 46,165,097
K = % of I	Optimism Bias (Public Costs + OPEX)	£ 11,279,606
L = J + K + I	Total Public and OPEX costs (After Optimism Bias)	£ 77,630,228
M = (H/L)	Benefit Cost Ratio (BCR)	£ 3.50
N = H - L	Net Present Value (NPV)	£ 193,909,429
O = (N/I)	NPV per pound of public expenditure	£ 9.61
P= N/(I+J+B)	NPV per pound of total economic cost	£ 1.95

**Additional Economic Benefits**

The GVA from industry jobs created is estimated to be £595.9m.

The additionality follows the same realistic assumptions as the preferred case, except for the leakage sub-regional level of 15.8%. By applying the aforementioned factors, the gross benefits of £506.3m, up to 2039/40, are reduced to £271.5m of additional net benefits.

**Operational Expenditure and Capital Expenditure (Public and Private)**

The operational expenditure associated with running DISC (R&D and skills) until 2039/40 equal £46m, whereas public capital expenditures and other fixed costs amount to £20m and private, to £33m. An optimism bias of 17% was used, an addition to both costs, to allow for the potential for optimism in the cost forecasts. We believe this is a very cautious approach given our experience, having completed DISC in Harwell and the Innovation Centre at Westcott.

**Benefit Cost Ratio**

Considering the monetised benefits and costs described above, DISC Option 3 would deliver a Net Present Value of £194m, with a Benefit Cost Ratio of 3.5:1.

**Option 4 - Larger DISC without Skills (6,000 sqm)**

Cost Benefit Analysis (Present Value and 2020/2021 Prices)		Larger DISC without Skills Centre
A	Cumulative GVA from Jobs	£ 1,191,891,878
B	Private Costs (disbenefit)	£ 66,569,669
C	Skills Uplift	£ 0
D = (A+C)	Total Benefits	£ 1,191,891,878
E = D - B	Total Benefits net of Private Costs	£ 1,125,322,209
F = % of E	Optimism Bias (Benefits)	£ 112,532,221
G = E-F	Total Benefits Net of Private Costs (after Optimism Bias)	£ 1,012,789,988
H = G after accounting for the deadweight, displacement and leakage and substitution	Net Additional Benefits (after: Optimism Bias, Leakage, Displacement, Substitution, Deadweight)	£ 543,079,314
I	Public Costs	£ 40,371,049
J	OPEX	£ 92,330,195
K = % of I	Optimism Bias (Public Costs + OPEX)	£ 22,559,211
L = J + K + I	Total Public and OPEX costs (After Optimism Bias)	£ 155,260,455
M = (H/L)	Benefit Cost Ratio (BCR)	£ 3.50
N = H - L	Net Present Value (NPV)	£ 387,818,858
O = (N/I)	NPV per pound of public expenditure	£ 9.61
P = N/(I+J+B)	NPV per pound of total economic cost	£ 1.95

**Direct Jobs Created, Cumulative GVA from Industry Jobs and Optimism Bias**

An estimated The GVA from industry Jobs created is estimated at £1.2bn, benefits being realistically expected, in line with the reasoning of option 3. A 10% of Optimism Bias is applied to the benefits above.

**Additionality**

The additionality follows the same realistic assumptions as the preferred case, with the aforementioned exception for leakage and after applying the aforementioned factors, gives us £543m of additional benefits.

**Operational Expenditure and Capital Expenditure (Public and Private)**

The operational expenditure associated with running DISC (including skills provision) until 2039/40 equal £92m, whereas public capital expenditures and other fixed costs amount to £40m and private costs to £67m. An optimism bias of 17% was used, an addition to both costs, to allow for the potential for optimism in the costs forecast.

**Benefit Cost Ratio**

Considering the monetised benefits and costs described above, DISC Option 4 would deliver a Net Present Value of £387.8m, with a Benefit Cost Ratio of 3.5:1.

**2.3.2 Assumptions****Utilisation Forecast**

Zephyr, operational since early 2020, has averaged over 90% of utilisation within its first year of operations, having 47 staff, dependent on the facility, 24 staff of which currently working there. As

supply chains and production processes develop, we would expect the number of externally dependent workers to grow further. In the case of the recently opened Westcott WIC, this is forecasted to be oversubscribed, with Zone 2 of the Westcott WIC having 2 qualified and active prospective tenancy deals. There is further evidence of the increased ability of the Catapult to attract companies to Westcott, with, since April 2021, four companies having signed flexible office space tenancy agreements in the Westcott Innovation Centre.

The utilisation forecast is also grounded on the demand (and limited UK-supply) of DISC services and capability related with In Orbit Servicing and Manufacturing (IOSM), Rocket Propulsion and Advanced Manufacturing for Space. The DISC capabilities will support the development of the In Orbit Servicing Market, predicted to be valued at ~\$4.4bn (in cumulative revenues) within a range of \$2.3-7.2bn by 2030, of which the UK is capable of capturing ~\$1bn<sup>39</sup>; including activities such as In Orbit Inspection, Repair, Refuelling etc.

In addition, we have been engaging with multiple companies through an IOSM working group; the findings from a survey of 16 of these companies point towards the lack of existing UK infrastructure needed for the development of IOSM activities. DISC will be addressing this latent demand since, in the UK, the only comparable facilities are either commercial or university-based facilities, that have either restricted access or limited size.

### **Construction and Residual Value**

- Construction of the building is taken on at the Landlord's expense and the Catapult takes on the commercial lease
- We are not accounting for the benefits associated with the building's construction, including the gross value added, as this appraisal focuses on evidencing how the DISC model can generate benefits that are persistent across time, that go beyond a one-off big capital investment piece
- Buildings are assumed to have a lifecycle of 40 years, with the residual value of the building reducing the disbenefit of the private costs. The physical assets invested by the private sector will be renewed on a continuous basis, as the capex forecast includes a provision for reinvestment into new capabilities, refreshing and maintaining the offer. These assumptions are used when computing the residual value of the assets, which reduce the disbenefit of the private costs

### **Prices**

- As per the Green Book the deflator from the Office for Budget Responsibility was used to convert current prices to 2021/2022 constant prices
- All relevant monetary values used for the economic analysis were discounted, using the HM Treasury benchmark of 3.5%.

### **Cumulative GVA from Industry Jobs**

- Job creation and subsequent Gross Value Added (GVA) by employees was aggregated across the DISC capabilities and is presented as a cumulative value.
- It is also worth noting that some degree of turnover from the tenants and associated jobs is expected. Our utilisation forecast is assumed to always be below full capacity, and evolves according to the expected demand, so that the value of jobs created and its persistency across time is realistically set below full-employment, allowing for fluctuations in demand and labour market frictions.
- Our preferred option does not deliver the highest BCR or NPV values, recognising the importance Government is placing on Place-related benefits over pure cost benefits. The decision for selecting Option 2 is that it delivers long-term community and industry benefits by ensuring there is a skilled workforce for the businesses that use DISC and Westcott as their destination of choice. The Skills Academy within the DISC plays a vital role in enabling this level of growth by making sure adequate skills are developed and deployed to fulfil the needs of DISC enabled jobs. Without the Skills Academy, it is likely DISC Users would be forced to subcontract

<sup>39</sup> UK In-Orbit servicing capability – "A platform for growth" (Astroscale, Fair-Space, Satellite Applications Catapult), 2021



some supply-chain roles overseas. Over time this would accelerate job leakage from the UK, with some companies deciding to relocate operations abroad.

### Costs

- Building costs are based on national and regional cost per square meter
- Equipment costs are based on our 5G Centre, Innovation and DISC experience, plus inputs from OEMs and HVM Catapult for production facilities
- Fit out costs are based on National and Regional cost per square meter
- The cost schedule reflects the optimum completion date to access the DISC
- There will not be any significant delays to planning permission based on DISC's role in the wider masterplan being accepted by the local planning authority - completed during initial phase of funding.

### 2.3.3 Unquantifiable benefits

Because of the nature of the space sector and associated technology, innovation and progress associated with research and development is often led by the capability of the supply rather than a demand-led process, as downstream customers experience an unfulfilled latent demand for space-enabled services<sup>40</sup>. This often results in an underinvestment that DISC model tries to address, as the following unquantifiable benefits are expected:

- New or improved products, services, and solutions
- Additional inward investment
- Environmental and sustainability impacts, including BREEAM compliant. The facility itself will be built with energy efficiency in mind and a focus on reducing carbon footprint
- Benefits relating with elevating the status and influence of the UK, in regards to the global space economy, as a leader with significant domestic capability.

Moreover, the focus on the Agri-Tech and Health sectors as downstream customers will lead to positive environmental and societal health outcomes, as a natural by-product from higher investment in these areas – catalysed by DISC. The development of new products and services focused on Earth Observation (and other) data is also expected to support the Government's goal of addressing climate change-related challenges.

The skills provision within DISC will offer a professional annual training programme that will upskill existing employees. The nature of the programme will be designed in consultation with local and regional business needs whilst optimising the state-of-the-art facilities. We expect 20 such courses to be planned each year. In addition, businesses can rent the facilities to run their own training programmes aligned to specific needs. We have assumed 18 each year.

### 2.3.4 Digital Infrastructure

Digital infrastructure is a vital component of the space sector growth agenda. Satellite enabled services for Health, Agri-tech etc., will require a digital network to download, process and assimilate vast amounts of data.

Westcott already has a LEP-sponsored Catapult-operated Advanced Communications (5G) Centre; the DISC facility will be located adjacent to this facility. In addition, we anticipate several the activities undertaken in the DISC facility will contribute to future connectivity and 5G, and potentially 6G capability, including satellite-enabled services.

This in-built digital infrastructure capability will ensure that future provision and occupancy is not prohibited by lack of connectivity. In fact, the opposite can be said as the early adoption of 5G will reduce the need for fixed infrastructure to be maintained on site.

<sup>40</sup> As expressed by London Economics: <https://londoneconomics.co.uk/wp-content/uploads/2015/11/LE-UKSA-Return-from-Public-Space-Investments-FINAL-PUBLIC.pdf>

**2.4 Options appraisal – preferred option: 6,000sqm: DISC with Skills****2.4.1 Scope of work**

This option delivers a dual purpose 6,000 sqm Disruptive Innovation for Space Centre (DISC) with R&D and Skills facility to Westcott. The facility will be constructed by the site landlord (at their own cost) and leased commercially to the Catapult. The building will be equipped and commissioned by the Catapult ready for Industry (DISC R&D) and training provider(s) (Skills) sublease.

All equipment and fitout costs for both purposes will be funded by the grant. Operational start-up costs will be performed by the Catapult and funded from a BLEP operating grant. All external grounds work will be performed by the Landlord and recovered through the Catapult commercial lease.

The Satellite Applications Catapult will use the grant funding to procure high-demand R&D assets (facilities and capabilities), and ensure delivery, installation and commissioning is complete in 22 months. We need to consider the implications on timing in the academic year. Where the timetable does not allow this we begin operating the R&D facilities within 24 months of grant receipt and will plan the skills operations with the start of the academic year and the first cohort of students.

**2.4.2 Value for money****Conclusion and 2.3.1 Analysis and Value for Money Assessment**

Option 2 is the preferred option, despite not being the one that strictly maximises the Value for Money assessment. This is due to the recognition that the Government places on some of the national and place-related benefits, enabled by the skills academy, over an aggregate benefits figure. The decision for selecting Option 2 is that it delivers long-term community and industry benefits by ensuring there is a skilled workforce for the businesses that use DISC and Westcott as their destination of choice. The Skills Academy within the DISC plays a vital role in enabling this level of growth by making sure adequate skills are developed and deployed to fulfil the needs of DISC enabled jobs. Without the Skills Academy, it is likely DISC Users would be forced to subcontract some supply-chain roles overseas. Over time this would accelerate job leakage from the UK, with some companies deciding to relocate operations abroad.

Moreover, option 4 despite delivering high returns and very high VfM and net present value, it is associated with a less affordable funding requirement, which is the main reason for discounting it.

Option 2, having 2.82:1 of BCR, whilst options 3 and 4 maximize the BCR, with £3.5 of return for each £1 spent. These last two options also represent the highest bang for buck, in terms of NPV per pound of total economic cost, with 9.61:1 (options 3 and 4), compared to 6.92 (option 2). In terms of NPV per pound of public expenditure however, option 2 performs marginally better, with £6.92, compared with £9.61 of options 3 and 4.

The Net Present Value favours option 4, by a significant amount is with £388m, followed by option 2 with £209m and option 3 with £194m.

For context, a BCR that produces over twice the amount of benefit per unit of cost is termed high VfM. This is the case for all of the options, including the preferred option.

The Grant funded project unlocks £30m of commercial investment over a 10-year period to advance a Disruptive Innovation capability at Westcott. The Disruptive Innovation for Space Centre (DISC), created by the project, will attract industry to the site and establish new supply-chain jobs and commercial opportunities for the companies this high-impact environment serves.

As Industry designs mature within the DISC environment demand for additional facilities that trial new manufacturing techniques will increase. This will stimulate further investment opportunities for AI and Robotics, Data and Sensors, AgriTech and Health, along with the need for full-scale production of launch and propulsion systems, satellites, and payloads etc. This will be supported by the complementary skills provision.

The Westcott ambition is to use DISC and the other centres already operational on site as a catalyst for growth, establishing a Space Innovation Business Park at Westcott that generates a £1.9bn economic impact. The Satellite Applications Catapult track record at Westcott for developing facilities that generate impact is proven <sup>34</sup>.

An example is the 5G Centre, which has featured in projects where strategic partnerships have been established with Milton Keynes, Cranfield, Dorset<sup>41</sup>, and Sedgefield, and attracted companies like OneWeb and Valarann to the Westcott site. The projects this centre supports are delivering ground-breaking solutions on connectivity and stimulating the creation of new jobs. We have invested part of the £3.3m secured through this engagement and activity into Westcott.

### 2.4.3 Sensitivity analysis

#### Decrease in demand for the DISC centre

If we assume a reduction in the forecasted demand translated into a lower amount of FTE jobs enabled, we verify that even in the unlikely event that we experience a sharp decrease in expected number of jobs generated of 30% <sup>42</sup> for the preferred option across all years and unchanged costs, the benefit cost ratio for the preferred option would decrease to 1.97:1 but would still yield a significant amount of NPV: £112m.

#### Decrease in demand for the Skills Academy

In a scenario of a decrease in demand for the Skills Academy, on behalf of students, of 30% across all years, and assuming unchanged costs, the benefit cost ratio for the preferred option, decreases marginally to 2.76:1 and the NPV to £203k.

#### Increase in OPEX

In a scenario of increased operational expenditures, of 30%, across all years, whilst continuing to account for an optimism bias of 17% (on top of these increased opex values), option 2 experiences a decrease in NPV to £185m and of the BCR to 2.33:1.

#### Scenario of Decreased GVA per employee

The existing evidence on space sector labour productivity points toward an average productivity of space sector jobs to be around £145,468k per employee, and so a reduction of the GVA per employee to the regional level is not a realistic assumption. However, if that were to be the case, and if we assumed the GVA per job to equal the average Berkshire, Buckinghamshire and Oxfordshire (TLJ1) of approximately £69k, the BCR would be 1.3:1 with an NPV of £35m. However, as previously mentioned, this latter figure would grossly underestimate the GVA from DISC-enabled space sector jobs, since regional GVA ratios that include sectoral jobs that have a substantially lower labour productivity, measured by GVA per employee.

### 2.4.4 Associated issues and risks

Risk Management will comply with the Satellite Applications Catapult Risk Management Plan. To ensure user needs and issues are incorporated in the design and operation of the facility we have sought to de-risk the programme through:

- The adoption of continuous improvement cycles
- Early engagement of stakeholders.

These risks will be continually re-assessed through all remaining RIBA stages, led by one of our Programme Managers. Once the site transitions to 'steady state occupation' our Operational Facilities Team will be responsible for ensuring the site always remains fit-for-purpose for our customer, delivery partners and the market.

<sup>41</sup> <https://futurenetworks.space/the-first-uk-produced-5g-router-enabling-5g-at-sea/>

<sup>42</sup> In this sensitivity analysis we vary inputs, relative to our forecast in section 2.3.1.

**2.4.5 Proposed outputs and outcomes**

*In the table below insert a summary of the proposed outputs and outcomes that are expected to be achieved as a result of the project. Add further rows to the tables as required.*

*Provide a detailed profile of forecast outputs and outcomes in **Appendix 4**. This appendix includes definitions for a series of set outputs that the BLEP monitors performance against.*

**Proposed outputs**

Output	Output description	Output quantity	Method of independent verification	Delivered by date
1	Direct Jobs (Created and Safeguarded)	900	Incorporating measurements into the Satellite Applications Catapult's existing metric systems: Measuring Businesses Success and Growth, measurement annually (by surveys and assessments)	2039/40
	Indirect Jobs Created	693		2039/40
2	Number of apprentices opportunities each year	80 <sup>43</sup>		2032
5	Additional investment secured for tenants	70% of DISC tenants		2048
6	Spin outs created as a result of Research Infrastructure in DISC	65		2048
7	Technologies progressing through Technology Readiness Levels (TRL)	400		2048
8	Registered IPs	62		2048

**Proposed outcomes**

Outcome	Outcome description	Outcome quantity	Method of independent verification	Delivered by date
1	Improved Skills of existing workforce (not T Level or Apprentices)	20% of Westcott SIBP tenants	Incorporating measurements into the Satellite Applications Catapult's existing metric systems: Measuring Businesses Success and Growth, measurement annually (by surveys and assessments)	2030
2	Increase in FDI flowing to the UK	Net additional benefits		2030
3	Uplift in downstream usage of space applications	Size of market increase		2030
6	Increase of Competitiveness of the UK space sector	% increase in UK global share		2030
7	Economic Growth (GVA increase)	£497m		2039/40

<sup>43</sup> This number is expected to be achieved from Year 5 of the skills provision operations and assumes no further Phasing on the facility that will increase the potential size of annual cohorts and/or Apprenticeship courses made available at the Westcott DISC. The number does not assume that all apprentices will necessarily enter into careers in the space sector and/or at Westcott. This will be subject to the sustained growth of the Space Innovation Business Park generating the required jobs.

### 3. Commercial Case

The Commercial Case provides evidence of the commercial viability of a project and the procurement strategy that will be used to engage the market – providers, developers and suppliers to deliver the project. The OBC should be based on pre-procurement discussions and the FBC should document the final outcome of the procurement process.

#### 3.1 Procurement

##### 3.1.1 Procurement scope

Following successful award, the Catapult will enter into an Agreement to Lease with the Westcott site Landlord (PATRIZIA) enabling the provision of the building and the project to be completed:

- Equipment scoping - ongoing engagement with Industry to fully define the specifications and equipment needs. Identification of long-lead time items and expedite these through the following:
  - Equipment procurement - ensuring all equipment is scoped, defined, and procured
  - Equipment Installation - installation and integration within the building
  - Equipment transition - transition to operations and ready for use
  - Equipment maintenance - ongoing maintenance and calibration requirements known and budgeted.
- During the scoping of all equipment design / infrastructure requirements will be provided to PATRIZIA to ensure the building constructed is ready for the integration of equipment at handover to the Catapult.
- We will begin consultations with potential training providers to design the physical infrastructure and layout of the Skills Academy, recognising the potentially different needs of the different skills cohorts (T-level, Apprentice, Up-skilling, and Re-skilling).

*Please note that in parallel to this and outside of Grant funding, the Catapult will continue its dialogue with BLEP, the Local Authority and Industry to establish the Enterprise Alliance as a legal entity. See Section 5.2.3: in the Management Case for further details*

**The equipment procurement (and CAT B works) will follow the Catapult's procurement policy which follows public procurement rules, summarised in this table:**

Estimated Contract Value	Procurement Route	Process Required	Time to complete (Total days) Estimate from issue of request to quote
Up to £10,000	1 x Quote	Written Offer	N/a
£10,001 - £60,000	3 x Quote	Request for Quotation template (if required)	15 – 20 working days
£60,001 - £183,301	1 x Quote (min) depending on response	Advertise on <ul style="list-style-type: none"> <li>• UK Contracts Finder</li> <li>• Catapult Opportunities website*</li> </ul>	25 working days Includes minimum 14 day advertising period
£183,302	1 x Quote (min)	Advertise on <ul style="list-style-type: none"> <li>• UK Contracts Finder</li> <li>• OJEU Website</li> <li>• Catapult Opportunities website*</li> </ul>	55 working days Includes minimum 30 days advertising and standstill period



### 3.1.2 Procurement strategy

The overall procurement strategy will be to shortlist the capabilities required (as identified below), ensure all timescales associated with each capability are known, follow public procurement policy rules and leverage the Catapult brand to negotiate and complete procurement to ensure all capabilities can be integrated as soon as the building is complete.

The benefit of having previously delivered a DISC concept at Harwell, and previously defining, developing, and delivering new buildings at Westcott, is that we have systems and processes in place that deliver cost-effective and timely results.

We have proven procurement lifecycles in place for the procurement and integration of capabilities.

We have a good working relationship with the landlord, PATRIZIA, having successfully delivered facilities at Westcott, and already have Agreement to Lease and Lease templates in place.

A draft schedule to build and equip the DISC building is included in **Appendix 12 (DISC.A12.01)** and has assumed a duration of 35 months. However, our proposal incorporates contingency to accommodate integrating early adopters into the DISC facility before declaring DISC operational. This would take the long-stop date to March 2025 for full operations. Should the long-stop date be incurred, this will delay the first intake of students at the Skills Academy to the start of the next academic year in September 2025.

#### Construction of the Building

The construction of the building will be completed by the site landlord (PATRIZIA), who will also bear the cost as a commercial investment. It is therefore not part of the Catapult's procurement. However, we will ensure that the building is delivered on time and to our specification, handing over to the Catapult to complete CAT B, furniture, fixtures and equipment (FF&E), ensuring that the integration of capabilities is seamless and timely.

Using our experience of completing the DISC in Harwell and The Innovation Centre at Westcott, we have created a Building Projects Manual, capturing all key design elements DISC requires.

The procurement list must have a certain level of flexibility; we need to respond to the sector needs, and ensure that the equipment is cutting-edge, fit for purpose, and delivered at the right time. Enabling the sector to overcome barriers is highest priority. An example equipment list, including the current prioritisation is included below. However, it should be noted that the equipment list will be confirmed and procured only once final validation and further scoping is complete. The equipment list will be consolidated alongside the end users of the facility, with a maximum procurement budget of £23m and £7m fit out and project costs:

System / Capability	Purpose	ROM Cost
Cleanrooms from ISO 6 to ISO 8 including teaching	For the assembly of components, spacecraft and launch vehicle systems	£2M
Advanced manufacturing facilities including: <ul style="list-style-type: none"> <li>• Cold Spray additive manufacturing</li> <li>• Neutral Beam additive manufacturing</li> <li>• Wire Arc manufacturing</li> <li>• Very Large Robotic Assembly</li> <li>• EDM and Spark Erosion</li> <li>• Multi Axis CNC machine Centres</li> <li>• Automatic Composite Lay-up</li> </ul>	Manufacturing capabilities using robotic and automated production facilities to build low to medium volume parts in metal, alloys and ceramics with state-of-the-art productions systems for spacecraft, launch vehicles, ground segment and other systems	£7M
Testing systems for spacecraft including: <ul style="list-style-type: none"> <li>• Thermal Vacuum chambers</li> <li>• Vibration and Shock testing</li> <li>• Solar Simulator</li> </ul>	Equipment to support the test, validation and verification of spacecraft and associated components prior to launch	£2M

Analogue Trial environments including <ul style="list-style-type: none"> <li>• Lunar test and verification yard</li> <li>• In-Orbit docking, refuel and rendezvous.</li> <li>• Neutral buoyancy testing tank</li> <li>• Virtual Robotic Control centre</li> </ul>	Environments to replicate and simulate the conditions equivalent to that of space and the Moon to provide validation of commercial products and services	£5M
Visualization and Modelling Suite	Virtual and Augmented Reality modelling capabilities to provide digital twinning and synthetic environments for development of processes and product prior to production and operation	£1M
Propulsion testing for up to 30T rocket engines and electric propulsion validation	Simulation and rocket engine test facilities to provide exposure and training of complex systems in addition to validation of new products	£1M
Electronic and Electrical Testing Labs	To test electrical systems and electronics, validate new processes and to manufacture low to medium volume products	£1M
Assembly Hall and Teaching Space including List X facilities, overhead cranes and lifting equipment	Large volume hanger to provide space to assembly spacecraft, launch vehicles and provide a teaching and training environment. List X assembly space will provide a secure manufacturing environment for UK defence and security service requirements	£4M

Equipment for the Skills Academy component of DISC will be determined in consultation with potential training providers, coordinating with the Bucks Skills Lead, and recognising the specific needs of the differing skills cohorts (T-level, Apprentice, Up-Skilling & Re-Skilling). Standard procurement processes will be followed. It is expected to be the same as, or similar to the equipment in the R&D facility as the purpose of co-locating the two is to have students embedded, as much as practically possible, in the real world working environment.

The Catapult will follow the procurement rules compliant with the national post-Brexit environment and subsidy control regime. Contractors are yet to be selected; however, the example below outlines previous procurement exercises and how this will shape our procurement timescales and strategy.

### 3.1.3 Evidence of demand or market interest

Since its' incorporation in 2013 the Satellite Applications Catapult's purpose has been, and continues to be, to support the growth of the UK space sector. As part of that activity the whole organisation of 170 staff are focused on engaging and energising the market and generating demand. Since 2019 we have actively:

- Undertaken 232 academic collaborations
- Collaborated with 451 industry partners on projects and initiatives
- Engaged 669 SMEs, including non-UK SMEs looking to establish a presence in the UK
- Completed 109 international collaborations on large, complex projects.

As this work continues, and the sector continues to grow, we will continue to leverage the facilities at Westcott for businesses to locate, to expand, and to use as a base for project work in both the existing and future facilities.

**Evidence of demand for DISC at Westcott**

Over the past 18 months we have engaged potential users of DISC and established a portfolio of companies expressing interest in relocating to Westcott, conditional upon project approval and transport links to the site being improved.

Following the submission of this FBC, the Catapult will enter a six-month period of consultation with prospective users to select the most compelling projects for DISC and prioritise skills requirements. This process will be carried out alongside construction works for DISC and will inform the final configuration of equipment to be procured for the project.

This approach complements the lessons learned from Harwell, which ensured the highest impact projects for DISC were selected. **Appendix 7 (DISC.A07.01)** Case Studies highlights the strategic importance of the projects being performed and shows the potential for Westcott investment.

As part of our Industry engagement, we have sought and continue to understand:

- What activities end users intend to undertake whilst resident in DISC
- The required duration of their tenancy, and an understanding of their post-DISC requirements
- Their infrastructure requirements; including the split between office and manufacturing / lab, e.g., Clean Rooms
- Any equipment and specialist tools needed and timescales, prioritising those in high demand and low availability
- Their priority skills needs.

This knowledge will continue to evolve and ensure that by contract award, we are confident that:

- The right number of tenants can be accommodated at any given time
- The size and configuration of the building
- We understand when we need to engage future tenants to ensure we deliver value to the customer and achieve the strategic aims of DISC and the growth of the Westcott site.

The list below details the industrial organisations we have been engaging (and continue to engage with). We expect DISC to attract additional inward investment, with new organisations to the UK basing themselves at Westcott, as well as new organisations Catapult are currently supporting from incubation stages:

<b>Westcott DISC companies engaged to-date</b>		
3D Systems	Airborne Engineering Ltd	Airbus
Alphid Ltd	Arralis Technologies Ltd	ASTRA
AVS UK Ltd	Brailsat Harald	Cobham Aerospace Connectivity
Elcorn Limited	European Astrotech Ltd	Extend Robotics
Falcon Project	GMV	GS Consulting
Helix Technologies Ltd	Honeywell	IMT Ltd t/a Vislink
In-Space Missions Ltd	Isotropic Systems Ltd	Jacobs
KNS Inc.	Lift me off	Lockheed Martin
Magdrive	MEDeus	Moog
Motiv Space Systems Ltd	Nammo Westcott Ltd	New Space Systems
New tec	Newbury Electronics Ltd	Northrup Grumman
OneWeb	Open Cosmos	Orbital Astronautics
Oxford Space Systems Ltd	Ox Dynamics	PA Consulting

PSG	Printech Circuit Laboratories Ltd	Protolaunch
Puffin Systems	QuadSAT	Raytheon
Reaction Engines	Resodyn Europe	Stratian
Steamjet	Total Flow	Thales UK
TriSept	Total Carbide	Ultra Electronics-Gigasat

### Background information, supporting growing demand:

Commercial investment in satellite systems and services technology and markets has been increasing at an average of 12% per annum for the last thirty years, such that in 2018 the global satellite systems and service market was over \$340Bn, comprising \$100Bn science and government services, and \$240Bn commercial systems and services (\$120Bn services, \$100Bn devices, \$20Bn satellite manufacture and launch).

The growth of these markets has not been a uniform geometric increase; rather each sub-sector has experienced significant periods of extreme growth. Examples including satellite TV during the 1990s, and the explosion of global navigation satellite systems (GNSS) devices into industrial and consumer markets during 2000s. In each case, the new satellite (upstream) capabilities have driven successive waves of innovation in the user-segment (downstream) devices.

The general trend towards miniaturisation of ever more capable components is being reflected in the satellite market, with small, cheap to build and launch, satellites becoming a major growth opportunity. Moreover, the low cost of each small satellite means that operating them in coordinated constellations becomes economically feasible, the advantage being to increase the instantaneous coverage of Earth from low to medium altitude orbit for applications including communication and Earth observation. The thousands of satellites currently being deployed to provide global broadband services are only the start of opportunities for utilising small satellite constellations for transformative applications with enormous commercial potential. These include near-real-time global situational awareness of weather and other environmental conditions, as well as bespoke applications for specific sectors such as Agritech, fishing and energy production. The cost of small satellites is now such that they are accessible to individual corporations for dedicated applications, for example to monitor world-wide supply chains in the food industry.

The UK is well placed to take advantage of the considerable opportunities afforded by small satellites and satellite constellations, but only if it mobilises and adapts to this rapidly changing market. As well as building and launching new satellites, opportunities exist in managing the assets in orbit, including debris removal. Equally, it is important that satellite and instrument designers work closely with end users to construct systems that meet real market needs, especially when dealing with the extremely high volumes of data that these systems can produce. Data analytics is an important component of overall system design in order to develop world-leading new products.

All of this requires innovation throughout the value chain, from the way satellites and satellite instrumentation are built to the design of data products and the depth of engagement with end user communities.

Similar arguments apply to closely allied fields such as UAV (Drones) and advanced communications. These both feature in our existing investments at Westcott, taking advantage of the favourable characteristics of the site for evaluation, demonstration, and testing of safety-critical systems. There is substantial cross-over with space in the underlying aerospace technologies, reliance on space infrastructure for safe operations, and shared applications markets (e.g., Geospatial monitoring, Agritech). As detailed in Appendix 7 (DISC.A07.01): Case Studies, both Drone and Advanced Communications technologies present disruptive commercial opportunities for the UK. As with space, realising these opportunities requires investment in 'Product Factories' and 'Techno Centres' to stimulate innovation, build indigenous supply chains and to stimulate and penetrate user markets.

By providing the environments in which companies can undertake product, service, and applications development, with a skilled cohort to deliver those to market, we will help to maintain and substantially grow the UK industry presence as suppliers and distributors for technology and services in these significant global markets. Our target is to help companies be first to market in innovative new products and services that exploit the burgeoning commercial Earth-orbital market, and the disruptive potential of Drones and Advanced Communications infrastructure. DISC aims to serve this purpose, and at the Catapult we are witnessing significant take-up of our operational prototyping and testing capability. To secure this growth and capitalise on the momentum already generated we need to increase the capability, capacity, and accessibility of all infrastructure relevant to the development, product engineering and early-stage advanced manufacturing processes.

Innovation Zones (also mentioned in 3.2.2).

The equipment that will be incorporated in DISC will need to facilitate both upstream (innovation in space and related segment manufacturing) and downstream (innovation in user segment product/device manufacturing).

The high-urgency baseline cost estimates are indicative of the investment required over a 2-year period. The full costs assume investment over a 10-year period as DISC demand increases. These latter estimates are based upon a significant take-up of the facilities, and it will be essential that we prioritise the equipment procurement activities in each of the capability zones so that this aligns with the anticipated demand determined through extensive and continuous engagement with the UK high technology product manufacturing base.

While there are some high-level themes which underpin these two domains, the detailed specifications required for the equipment and the nature of the access required is likely to be quite different, and therefore these are costed separately.

The DISC facilities will complement the networking, services and applications test facilities being incorporated into the 5G test-bed and Westcott Innovation Centre.

### 3.1.4 Third party services

The Catapult will employ:

- Technical specialists, ensuring that the capabilities specified are scoped and tendered to meet market demand
- Business Engagement personnel, working with the technical specialists to set up thematic working groups, ensuring capabilities are scoped and defined by the sector needs
- Procurement specialists to work solely on the DISC project. This fixed term contractor or employee will be based at Westcott and will be incorporated into the centralised Catapult finance team
- Legal consultancy will be used to support the procurement team – creating and negotiating on the supplier and commercial contracts

## 3.2 Contract management and risk allocation (FBC stage only)

### 3.2.1 Contract management arrangements

There are four types of contracts that will be applicable for this project:

- 1) Catapult's suppliers must agree to Catapult's T&Cs as outlined in our tender exercise. As mentioned in section 3.1.3 we will leverage our brand to negotiate on commercial terms and achieve supplier discounts, demonstrating value for money
- 2) End users of the Facilities will enter appropriate contracts (Leases, Licences, short-term contracts), all of which will be created by the project team (using existing templates)
- 3) Contractors, or employees working on this project contracts
- 4) Leases with PATRIZIA (already drafted) to be exchanged as soon as this FBC is approved



### 3.2.2 Contract milestones

Five procurement rounds will be completed. This will enable us to separate requirements by longer lead time items, procurement, and installation/ integration requirements. Catapult Project Steering Board approval will be sought to proceed with each round of procurement:

- P1: Early identified, high-value, long lead time items (K/O + 6 months)
- P2: High-value, long lead time (P1 + 6 months)
- P3: Immediate need for equipment that can be used in the other Westcott facilities ahead of construction completion (P2 + 3 months)
- P4: Majority of equipment – high and medium value, medium-short lead times (P3 + 3 months)
- P5: Short lead time equipment, procured with remaining budget (P4 + 3 months)

All equipment to be ordered, integrated, and commissioned in the facility by the completion date (April 2024).

### 3.2.3 Risk allocation

The following table list out the potential risks to the project, and the mitigation. All risks are captured in the Risk Register in **Appendix 6 (DISC.A06.01)**.

Risk	Level	To Whom	Mitigation
1 Timescales associated with specialist equipment exceed expectation	M	Catapult	Create five phased procurement approach, identify long lead equipment early and procure in procurement round one.
2 Costs of equipment higher than expected	M	Catapult/ Customer	The costs provided have been benchmarked against similar equipment previously procured. Undertake procurement exercises early. Allow contingency on larger (early) procurements.
3 Structural strength of the building is insufficient for the equipment required	H	Market	By engaging with potential tenants already to understand their requirements, we will identify needs early including specialist equipment. Employing technical specialists to ensure the building specifications are clearly defined/ delivered.
4 There are faults with the fabric of the building post-handover, delaying integration of equipment	M	Partner	Ensure handover for building is completed and all snags are logged and completed. Work with suppliers to ensure delivery and integration seamless upon completion of the building.
5 Construction project overruns causing delays	H	Partner	Procurement activities to commence - installation and integration works to be condensed.
6 Insufficient numbers of students registering for T Level / Apprenticeship places	M	Partner	Develop a 30 month outreach and engagement programme to schools in Buckinghamshire, Oxfordshire and High Wycombe working with LEPs and skills teams to promote space, engineering and manufacturing and the courses being offered at Westcott's DISC

7	Building is not ready for the start of the Academic Year	H	Catapult	Target for building handover to be completed in March 2023 (6 months prior to the start of the academic year in September). If handover slips, priority will be given to getting the skills facilities ready
8	Insufficient number of businesses and/or apprenticeship places offered to me cohort demands	H	Catapult	Working with the customers, landlord and the LEP team we will look at the tenancy terms to include social return on investment considerations.  The LEP will help identify, engage, and agree opportunities with complementary businesses and industries in the region who will benefit from engineering and manufacturing T Level Students and Apprentices (in addition to the space sector).
9	Planning permission is not provided in a timely manner	H	Catapult	Working with the landlord, ensure that an outline planning application is submitted by T+1 month to mitigate potential for any subsequent delays.
10	Agreement to Lease signature is delayed	M	Catapult / landlord	Use lessons identified in, and relationships from, Plot 4000 projects to mitigate.

### 3.3 Accountancy treatment and service requirements (FBC stage only)

#### 3.3.1 Assets

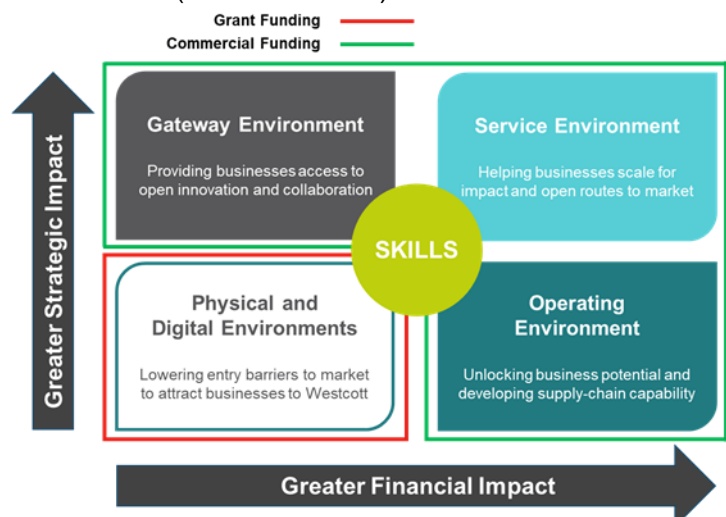
##### Ownership of Assets

The Catapult holds ownership and responsibility for the maintenance, security, and safe operation of DISC assets. Within 12-months of DISC becoming fully operational. ownership and responsibility will transfer from the Catapult to the Enterprise Alliance, described in Section 5.2.3. The Catapult will maintain an active role within the Enterprise Alliance as a partner.

The Enterprise Alliance will ensure sufficient funds are reinvested each year from DISC User rental charges to:

- Renew and maintain the capabilities within the DISC
- Promote, develop and drive utilisation of the DISC (R&D and Skills).

Furthermore, the Enterprise Alliance will provide private investment to develop the operational, gateway, and service environment of DISC. This will cover investment in the expansion of the wider Space Innovation Business Park - creating and expanding new facilities to operate on site in a way that is complimentary to DISC operations. The Enterprise Alliance will also promote apprenticeships, retraining and development of sustainable jobs in the area.



**Depreciation of Equipment**

This needs to be considered over different timelines, depending upon the nature of the assets for example:

- The environmental test equipment has the most persistent value, as the requirements change relatively slowly. Such DISC capability zones may be depreciated over a 15-year lifetime, with relatively low operational requirements for maintenance
- The manufacturing and prototyping equipment will have a shorter lifetime, as the high-value manufacturing technology for such future systems is likely to become obsolete within a 7-10 year time-line. Furthermore, such equipment is likely to require a somewhat higher provision for maintenance, to ensure safe and efficient equipment usage
- The system emulation, performance measurement, and electromagnetic compliance subsystems have a rather shorter lifetime, likely to need to be depreciated over a 5 - 7 year lifetime, with a the main operational budgetary requirement being for maintaining software licenses
- Equipment for generic training purposes will generally have a long lifetime in terms of utility, whereas specialist training needs will be naturally aligned with demand within the R&D facilities.

**Grant Beneficiaries**

These are defined as DISC Users and DISC Operators (i.e., Enterprise Alliance). Subsidy Control and compliance is overseen by the LEP and managed by the SA Catapult within the Enterprise Alliance Construct, see section 5.2.3.

DISC Users benefit by gaining access to expensive specialist equipment on a day rental rate basis. Funds derived through this mechanism are used to provide match funding over a 15-year period.

The DISC Operator benefits from the commercial investment opportunity afforded by an operational environment that attracts industry Users in the manner described within the body of this document. In return the Operator (i.e., Enterprise Alliance) provides commercial match investment and takes responsibility for the development of DISC operations and wider investment opportunities on site.

**3.3.2 Operational service considerations**

The contracts entered into with DISC Users will ensure that a pro-rata charge for equipment capabilities as well as operational costs are covered in the rental charges, and that (once the facility is 50% utilised) the centre is self-sustaining.

The Catapult's charging mechanism has been built from the ground-up. We have collated all the activities annually, that will be required to support the landlord, Catapult, equipment, and wider ecosystem. These include utilities, facilities management, annual safety checks, maintenance and calibrations, insurance, and the provision of expertise to bridge knowledge gaps, upskill and ensure organisations overcome barriers.

Having listed all these items, in addition to staff resourcing and depreciation of assets, the Catapult has calculated the cost to the square meter. This unit price anticipates a small surplus which will be reinvested into the DISC facility, ensuring that the site remains fit-for-purpose and fully utilised.

Using this model, we will charge each tenant dependant on:

- Area (sqm) of office space required
- Area (sqm) of lab space required
- Area (sqm) clean lab space required
- Area (sqm) of workshop space and cost of equipment usage.

Our charging mechanism also allows for specific equipment to be hired, separately from any physical space. The charge for this will vary depending on the cost of the equipment being request.

Our ambition, based on market engagement and feedback, is to include a List X<sup>44</sup> area as part of DISC at Westcott. We know that this will be of significant interest to the market. It can also be charged at a higher rate which is around £2,500 per square meter, significantly higher than other facilities in the area.

It should be noted that there are no TUPE considerations, and the Catapult will hire operational staff to be based full-time at Westcott, contributing to employment opportunities in the region, directly as well as indirectly.

### Operational Model

It is likely that different approaches will be required for upstream and downstream organisations, owing to the different development timelines, and nature of the work being undertaken. We want to be able to service both needs and:

- Encourage persistent industry presence on the Westcott site
- Facilitate interim utilisation of the facilities for high value project delivery

For the skills provision at DISC, the Catapult has begun to engage with potential training providers to identify those with the required quality and experience to support the curriculum delivery. Once funding is secured, we will run an open competition to secure the services of an organisation or organisations to run the facility and become part of the Enterprise Alliance structure. The priority will be in the quality of teaching rather than volume of students and/or courses. This approach is set out in **Annex 13 Skills Overview (DISC.A11.01)**

### A mix of service models will be required

One approach that helps to mitigate the commercial risks to smaller organisations that are undertaking high technological risk is to agree a package of support at the outset of a large development project or commercial venture, such that this can be costed into development plans and proposals to investors or funding agencies.

This will require Catapult to be involved in the estimation of the work to be undertaken, an analysis of the types of equipment to be used, and an evaluation of technical risk. Once this has been done, a fixed price associated with the project support can be negotiated, with flexibility over timelines and nature of the resources to be made available. This means that the financial risk, and administrative burden on both organisations can be minimised.

An example of the Catapult's three-tier operational model is below:

- **By-you:** End users will use the facilities with very little support or intervention from the Catapult (expected least usage)
- **With you:** Working alongside Industry the Catapult will upskill employees and ensure that they become self-sufficient by the time they have completed their prototypes and ready to move into mass production (outside of the facility). This is the primary expected usage of the facilities
- **For you:** When Industry do not have the correct level of skills and knowledge the Catapult will provide expertise – either seconded to the organisation, or simply by a day rate, to complete the work on Industry's behalf. Providing results rather than upskilling. This may be the preferred model for many downstream users.

<sup>44</sup> List X contractors are companies operating in the UK who are working on UK government contracts which require them to hold classified information. This information is at 'Secret' or above or international partners information classified 'Confidential' or above, and is held on their own premises at a specific site. <https://www.gov.uk/government/publications/security-requirements-for-list-x-contractors>

## 4. Financial Case

The cost and revenue forecasts used for this FBC are set out in the following section.

### 4.1 Project budget

Costs for build and fit out are derived from national and regional statistics (Cost/sqm) for Innovation facilities. This has been calibrated against previous build costs for the Westcott Innovation Centre and Harwell DISC. In all cases the higher band of cost has been used for prudence in preparing this business case.

Equipment costs are based on outline specifications and budget costs taken from OEMs for the DISC operation. The exact configuration and equipment requirements will be finalised during the User engagement phase of the project. Maintenance, refurbishment, and replacement costs are taken as 10% per annum of the total equipment and fitout costs.

Revenues are based on sub-lease fees and equipment rental charges for DISC, assuming 50% utilisation after 3 years of operation.

- The project financial profile can be found in **Appendix 5 (DISC.A05.01)**

	Previous years	2022/23	2023/24	2024/25	Future years	Total
Local authority						
Other public sector						
Private sector		£2,000,000	£8,000,000		£10,000,000	£20,000,000
Third sector						
BLEP capex Grant funding requested		£7,500,000	£12,000,000	£10,000,000		£30,000,000
BLEP Development funding requested (eligibility applies)						
Funding source to be established						
<b>Total capital cost</b>						<b>£50,000,000</b>
<b>Revenue funding for project delivery</b>						
Local authority						
Other public sector						
Private sector						
Third sector						



Funding source to be established		The Enterprise Alliance will provide £10m of match-funding over a 10 year window to develop the DISC operating, gateway and service environment			£10,000,000	£10,000,000
<b>Total revenue cost for delivery</b>					<b>£10,000,000</b>	<b>£10,000,000</b>
<b>Revenue consequences for benefit realisation</b>						
Local authority						
Other public sector						
Private sector						
Third sector						
<b>Total revenue consequences for benefit realisation</b>						
<b>Total project cost</b>						<b>£60,000,000</b>

## 4.2 Affordability

### 4.2.1 Options for financing the project

Rather than ask Government to fund the entire project we have agreed with the landlord (pension fund owner) to fund the construction of the building from private sources. This reflects the level of confidence both parties have in the project and removes this liability from public sources.

Experience shows industry will not use other industrial owned equipment and will need to see equipment funded and maintained from a neutral source. The Catapult has a proven track record with all stakeholders as a neutral trusted convenor. As such the Catapult can use commercial revenue from sub-lease and rental charges to maintain, service and replace equipment. This model has already been proven at the Harwell DISC.

Government funding therefore is requested to manage procurement of equipment / capabilities and to integrate into the facilities before commercial operations commence. Once the combined R&D facilities and Skills Academy in DISC is operational it will become self-sustaining.

### 4.2.2 Match funding

In developing the DISC concept, consideration has been given to alternative sources of funding including commercial investment. As a result, we have developed a blended funding model across the entire lifecycle of the 15-year DISC Business Plan. This approach will leverage the power of public funding to initiate the transformational change needed, while creating the conditions for sustainability through commercial means.

Funding starts with £10m of Commercial investment provided by the site Landlord to build the facility and £30m of Grant funding provided by the LEP to procure, install and commission the equipment that will allow UK companies to make a step change in their ability to grow in the Space sector. A major driver for Grant funding is Industry User need for equipment to be neutrally sourced at the outset. This avoids the pitfalls associated with coordination failure of SMEs not having open access to critical equipment at the right time during the development lifecycle.

Once the DISC becomes fully operational commercial funding flows from two discrete sources. The first source of investment comes from commercial organisations working with the Catapult within the

Enterprise Alliance. This investment is phased over a 10-year period to create and evolve the wider service environment of DISC and its ecosystem. The service environment integrates the very best innovation techniques and management tools into an ecosystem for growth, addressing the intangible barriers to success. These services will include brokering of contacts through the Gateway to establish new customer relations and supply chains, innovation as a service, support for company scale-up etc all of which will help to unlock business potential and optimise performance across newly formed DISC-enabled supply-chains.

The second source of funding is derived from DISC rental charges over a 15- year period. Revenues received from DISC Users are used to cover operational costs, invest in new facilities as a contribution to match funding, and offset any costs associated with delivering the Skills Academy.

This approach ensures the commercial viability of DISC and creates the pathway for DISC to scale and provide the impetus for growth at Westcott. The Enterprise Alliance will be in a position to also attract investment for other facilities on site to meet the wider innovation and production needs of industry as they coalesce in the region.

The support environment of DISC provided by the Enterprise Alliance will include a suite of finance-related advisory services to companies that need expert help in navigating the complexities of the financial sector, enabling them to secure the resources they need in a timely manner. At a tactical level, companies will be able to access business support services to fill capability gaps in areas such as Commercial, Legal, Marketing, HR, Finance, business mentoring etc. Companies will also be able to access the skills provision incorporated into the DISC building for skill development and training capability.

The exact value of the commercial investment is difficult to quantify at this stage, but it expected to easily match the public sector investment over a period of about 10 years. Initial conversations demonstrate that there are multiple viable paths to bring in the capital required for a thriving DISC ecosystem, including commercial investment, foreign direct investment, and private wealth vehicles, as well as an appetite worldwide to invest in growth sectors such as space. The Catapult team will mature these concepts as part of the delivery of the project, working with the Enterprise Alliance partners.

#### 4.2.3 Grant Capital and Operating Funding

This project requests both capital and operating funding.

**Capital.** The equipment and facilities required for DISC are inherently expensive and act as a barrier to market for small companies trying to access the UK space sector. Using grant capital funding, maintains the neutrality and removes the barrier to market, allowing sufficient time for the DISC to become commercially viable and self-sustaining. The capital grant will be used to pay for the CATB and final finishes to the building and all procurement of capabilities within. When users of the facilities use these capabilities; amortised depreciation costs will be charged, as well as the percentage of operational costs.

**Operating.** It is forecast that the initial period of integration of equipment and the first 3 years of operation will likely see operational costs exceed revenues. Under these conditions, the operating grant will bridge the gap between start-up costs and revenue income. From year four of operation the facility will generate sufficient income to support the ongoing operational costs.

#### 4.2.4 Loan arrangements

N.a.

#### 4.2.5 Availability of BLEP funding

It has taken seven years and much effort from multiple public/private sector stakeholders to establish this level of momentum and international interest. The conditions for growth are exceptional and other countries are mobilising to gain their share of this burgeoning market. Failure to secure funding in the timescale proposed, may risk losing this opportunity to other countries.

<b>4.3 Due diligence</b>
<b>4.3.1 Applicant organisation's financial status</b> <i>(BLEP to advise if information is required)</i>
The Satellite Applications Catapult is an independent Research and Development organisation, backed by UKRI; full audits are completed annually, and full accounts are available upon request.
<b>4.3.2 Partners' financial status</b> <i>(BLEP to advise if information is required)</i>
None.
<b>4.3.3 Independent assurance</b>
The proposed IPT model allows for continual independent oversight on the project by the LEP or any other preferred entity. This control can be seamlessly integrated into all aspects of the project.

<b>4.4 Financial risks</b>
<b>4.4.1 Cost overruns</b>
<p>The budget will be fixed, and cost overruns managed within the scope of the project and allocated contingencies.</p> <p>To ensure we secure maximum capabilities and return on investment, the capabilities procured will be finalised at procurement stage, allowing negotiations and thus flexibility on the budgets.</p>
<b>4.4.2 State Aid / Subsidy Control</b>
<p>For the Harwell DISC, the Catapult has taken considerable time and cost, employing independent expert legal advice, to ensure the DISC operations at Harwell comply with State Aid requirements. The same approach will be deployed for Westcott DISC, using independent expert legal advice to transition from the pilot Harwell operation to full-scale Westcott DISC operations within the Enterprise Alliance construct.</p> <p>The Catapult as an entity formed by UKRI is a recipient of public funds and is the perfect partner with LEPs to deliver such projects. The facility will be classified <b>Research Infrastructure</b> and will ensure compliance to State Aid Regulations during the project phase.</p> <p>Please note: We are currently updating our policies and guidance regarding the transition from the previous EU State Aid Framework to the revised UK Subsidy Control Framework, and we fully anticipate that our arrangements will continue to be compliant when the new Framework legislation goes live in 2022.</p>

## 5. Management Case

The purpose of the Management Case is to demonstrate that the preferred option is capable of being delivered successfully, in accordance with recognised best practice. It tests project's planning, governance structure, risk management, communications and stakeholder management, benefits realisation and monitoring and evaluation. The Management Case should be over halfway complete at OBC stage; at FBC, in addition to general updates to all questions Monitoring and Evaluation processes need to be finalised.

### 5.1 Project planning

#### 5.1.1 Project development and statutory requirements (*OBC stage only*)

A full programme (including construction works and five procurement rounds) is included in **Appendix 12 (DISC.A12.01)**.

#### 5.1.2 Project delivery plan

A project plan has been developed to deliver the new DISC at Westcott. The plan is built on the delivery of similar projects and complies with RIBA Stages and CITB standards; please see **Appendix 12 (DISC.A12.01)**.

Please note, subject to funding received, the dates are illustrative based on a signed GFA.

Dependency management will also be incredibly important on this project, noting that PATRIZIA will be responsible for the building's construction. An estimation for the building construction has been included in Section 5.1.3 below which would need agreeing with the landlord.

#### **Deliverability**

The Westcott Venture Park is owned by PATRIZIA, an international pension fund, who will be responsible for the construction of the building that will house the DISC. They have owned the site for 20 years, it is unleveraged (debt-free) and they have no plans to sell it. Among the fund's UK portfolio of largely retail and urban centre office accommodation, Westcott stands out as being comparatively immune to the effects of the current recession caused by the COVID-19 pandemic and is therefore seen by PATRIZIA as a priority investment over the next decade.

Alongside PATRIZIA the core project team led by the Catapult will ensure facility requirements are scoped, the building designed appropriately, and the capabilities ordered within ample timescales; allowing for seamless integration between installation, commissioning and go-live.

The Catapult is proficient in a range of project management practices including Waterfall, PMBOK, Prince2, Agile, Scrum, Kanban, and Lean etc. The project team will use a hybrid approach with Waterfall as the main project management practice and have deployed this approach successfully with several other buildings on the Venture Park.

#### 5.1.3 Critical path

**DISC – Upstream (Propulsion systems) and Downstream (Agritech and Health) and skills provision.** The timescales shown use the monthly phasing from funding approval. A master programme (with sample dates) is included in **Appendix 12 DISC.M12.01 Master Programme**.

1.	Project Start (funding approved)	October 2021
2.	Master plan created (including specific requirements for students in full-time education)	November 2021
3.	Planning permission achieved	May 2022
4.	Building construction complete	October 2023

5.	Equipment begins to arrive for both the R&D Facility and the Skills Academy (earliest order February 2022)	December 2023	
6.	Initial Operating Capability	April 2024	
7.	Mobilisation of Skills Academy ready for Cohort 1 (September 2024)	May 2024	
8.	Equipment integration complete	June 2024	
9.	Full Operational Capability	September 2024	
The above dates in the critical part assume a formal intention to proceed is received from the BLEP by October 2021 and Grant Award is finalised by April 2022.			

## 5.2 Organisation

### 5.2.1 Track record

The Catapult has been operational for eight years. In that time, we have successfully delivered a range of technically challenging projects to exacting time-constraints and budget restrictions. More specifically at Harwell we have completed a prototype DISC which opened its doors to Industry in January 2020 and is already heavily over-subscribed. Lockheed Martin (with SME supply chain) and Open Cosmos are among its first tenants, with many other shorter-term users. At Westcott, the Catapult has delivered a Future Networks Development Centre, Incubation Centre, and Innovation Centre. All have been delivered to the same high standard, delivering significant impact to the region.

DISC with its integrated Skills Academy at Westcott is a strategically important asset for the Satellite Applications Catapult as we work with Government, academia, and the space community to grow the UK's space capability on the world stage. This level of importance is recognised by our Executive Management Team:

- Alan Cox, Chief Commercial Officer, owns the strategic relationship with Westcott's local stakeholders, including the LEP, the landlord, and local partners including the ARC Group and Universities.
- Lucy Edge, Chief Operating Office, is responsible for our operational activities at Westcott, and our other DISC facilities. This facility will demonstrate the potential of both the DISC and regional models to deliver transformative benefits to the UK space sector
- Paul Febvre, Chief Technology Officer, has strong relationships with the emerging technologies that are evolving on the UK and global landscape. This knowledge and insight feeds into the predicted future demand for DISC at Westcott to ensure it remains attractive to future tenants
- Sam Adlen, Chief Strategy Officer, leads our work to identify who the high potential businesses are in the UK, and his team are committed to engaging and supporting them as they grow and become established in the market.

A dedicated Satellite Applications Catapult team will deliver the activities that will make the Westcott DISC facilities operational.

- Martin Smye-Rumsby, Westcott Area Manager, responsible for operations and development of the Westcott Space Innovation Business Park. He is accountable for investment, infrastructure and operations – sustaining and growing the nascent space ecosystem in propulsion, manufacturing, future networks, health and agriculture markets.
- Mike Curtis-Rouse is Catapult's Technical and Manufacturing Lead, working closely with potential tenants to translate their aspirations into the physical capability requirements.
- Mark Heelis, our Project Manager will have oversight and management of the project as a whole and will ensure all milestones are met. Mark is the Project Manager on our work for Plot 4000 at Westcott, and the funding for the DISC and Living Lab equipment, and the Drone test and development centre.



- Alex Pope is our Construction Manager, having overseen DISC at Harwell, and the Innovation Centre at Westcott, he is working with our Project Manager and site landlords to deliver facilities that are on budget, on time and to the right standards.
- Emma Hitchman is our Skills Lead, she will be part of the Westcott Space Skills Working Group, working alongside the Buckinghamshire LEP's Skills Hub Team, and Catapult partners and stakeholders, to develop the outreach and engagement programme, and procure the necessary training provider / operations provider, and build the professional skills training programme ready for the facility to be operational.
- Izzy Taylor is our Communications and Marketing Manager who has been actively supporting our activities in Westcott since 2018. She will continue to play an active role as part of the Satellite Applications Catapult's team at Westcott, promoting the activities and businesses working in our existing facilities and communicating new, upcoming opportunities.

Upon Grant award, the Satellite Applications Catapult team will engage industry and academia to finalise the equipment list for DISC and the Skills Academy. Selection of equipment will be based on industry demand and the impact effect of the equipment on the supply-chain and space sector. Once finalised, the team will enter into a competitive process to procure, install and commission the equipment within a purpose built commercially sourced facility. The facility will be built by the site landlord PATRIZIA. Over the past eight years the Satellite Applications Catapult and PATRIZIA have followed this process with great success and have developed a high performance relationship, with a track record for delivery excellence.

As the Grant project progresses, the Satellite Applications Catapult will form an Enterprise Alliance with Industry and other stakeholders to develop the Operational, Service and Gateway environments for DISC. Day-to-day operations will remain the remit of the Catapult until the facility operation is transferred to the Enterprise Alliance, which is scheduled to be within 24 months of DISC becoming fully operational. By the end of this period the DISC and its Operational, Service and Gateway environments will be demonstrated as a commercially investable entity for the future. It will also ensure that the commercial operation is compliant with subsidy rules and that the operating environment is de-risked before it transitions to the Enterprise Alliance. The DISC Operational, Service and Gateway environments will be developed by the Enterprise Alliance with the intention that private investment is sustained for at least 10 years at its own cost delivering match funding to the project.

Oversight of the Grant and the Commercially funded elements of this project will have the following governance arrangements:

- Strategic Board: Our Catapult Executive Management Team leads will meet with the partners on a quarterly basis to review progress and ensure the strategic ambitions are being met. For continuity, Martin Syme-Rumsby will also sit on this Board. Representatives from our strategic board are also members of Westcott's Space Board. The Strategic Board will set-up and have oversight of the Enterprise Alliance set-out in 1. Strategic Case.
- Operational Board: The technical team will meet monthly to ensure the programme remains on track and on budget. As required, the Operational team will escalate issues to the Strategic team to get direction or help to resolve issues. Their work will be focused during the RIBA Stages 1 – 8; once the facility is operational the Enterprise Alliance will be responsible for this activity.
- Procurement Board: Technical, operational, financial and construction teams from within the Catapult and external parties will work together through the procurement processes to ensure all capabilities are correctly specified, tendered, procured and integrated throughout the project. For skills-related activity, including the procurement of the delivery partner, the Procurement Board will work with the Westcott Space Skills Working Group to define and secure the right provider.

In all instances, meetings will capture all minutes, actions, risks, issues and assumptions. These will be reviewed and updated at each meeting, providing a means of reporting to the Buckinghamshire LEP, and escalating as required.

## 5.2.2 Use of external consultants

The Satellite Applications Catapult delivery team will be supplemented by a number of external consultants to deliver this project. Expertise will be sought as follows:

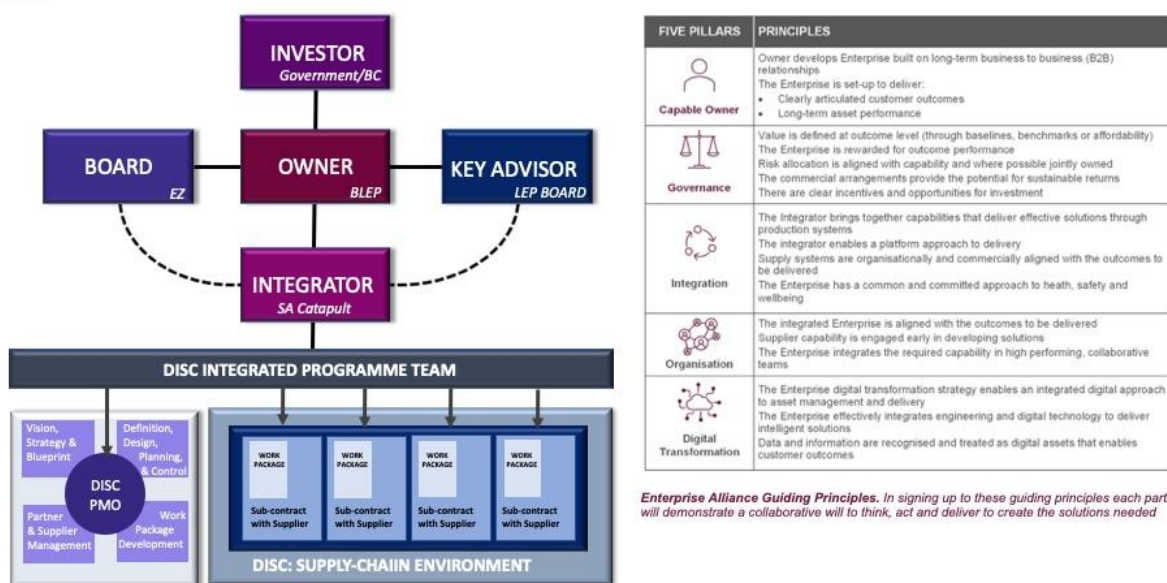
- High Value Manufacturing Catapult: Proven track record and the technical expertise with regard to manufacturing. Ensuring capabilities sourced and building requirements implemented correctly
- Independent technical expertise, scoping, and tendering procurement rounds
- Procurement expertise, independent experts contracted into the Catapult to ensure procurements are successful
- External architects and designers will ensure our requirements are scoped, meet appropriate regulations and prepare final designs
- Legal and Commercial. Creating contracts for the extensive procurements this project entails. As well as creation of end user templates contracts/ licences etc.

## 5.2.3 Succession arrangements

### Enterprise Alliance will be implemented as part of the succession arrangements

The Enterprise Alliance Model is proposed for the long-term operation of the Westcott DISC. The structure is laid out in the figure below. The Enterprise Alliance is designed as a vehicle to bring together multiple stakeholders with complementary interests and capabilities to run complex enterprises.

### Westcott DISC Enterprise Alliance Model



Following delivery of the Grant project under the auspices of the Satellite Applications Catapult, DISC will become a self-sustaining facility, constantly evolving, and adapting to market challenges and opportunities, making sufficient revenues to reinvest and keep the facility future proof. In line with our facility lifecycle model, the DISC will transition from project delivery to operations with defined ownership, and methodology for the identification and prioritisation of continuous improvement and issue management where it arises. The Enterprise Alliance provides a vehicle within which to bring in commercial partners that can assure long-term investment in, and sustainability of, the DISC

As DISC operations transition to the Enterprise Alliance (EA) under the Satellite Applications Catapult succession arrangements, full responsibility for the Commercial viability of DISC will be managed by the EA entity as follows:

- **Governance:** To ensure independent and neutral governance, a steering board will be set-up for DISC and will consist of senior leaders from partner organisations, alongside independent members, who will be selected by the BLEP and who will make up the majority of the membership. The steering board will meet at a frequency decided by the BLEP, and at least once a quarter.
- **Integrator:** Westcott is the first example of using an Enterprise Alliance. As initiator of the model the Satellite Applications Catapult will provide the integration role, providing the management across the programme team, reporting to the BLEP. The integrator will have accountability for the day-to-day operation of DISC, though responsibility for individual components will be distributed across the integrated project team. A comprehensive retrospective ('Lessons Learned') will be held, chaired by the steering board to capture any adjustment required. This will convene no later than six months after DISC operations commence.
- **Programme Team:** This is a collaboration of partners holding responsibility for the Commercial sustainability of DISC once it becomes operational.
- **PMO and Supply Chain:** Both the PMO and supply chain may include organisations that are not partners and are not represented on the steering board. Once DISC is operational these organisations will be involved in the support and maintenance of DISC operations on a sustainable commercial basis.
- **Commercial Operation:** Once operations commence, the EA takes responsibility for the DISC environment. Most notably, the Integrator role will transition at the earliest juncture to the Enterprise Alliance within the 24-month start-up period. The steering board will continue to have a majority membership which is independent from the EA DISC team.

At an appropriate time (as determined by the BLEP) the steering board may be absorbed into other relevant boards.

The Enterprise Alliance will ensure industry can call upon its expertise to train and maintain continuity of resource and retention of organisational memory through its Service environment.

## 5.3 Governance

### 5.3.1 Project management

From Contract Award to DISC operational handover, all project-related activities are managed by the Satellite Applications Catapult against the baselined programme. The programme will be updated as part of the weekly project management meeting and reviewed in the monthly Catapult Operations Board meeting. During the installation and integration phases the frequency of these reviews may increase. The programme contains key dates, milestones, and checkpoints as well as go/no-go decision points.

- Mark Heelis, the Project Manager will monitor continually to ensure that the project is on time and to budget, reporting to the Catapult's Director of Delivery
- PATRIZIA will be ultimately responsible for the construction phase, completion dates and sectional completion dates (specified in the programme).

Due to the remit of the Satellite Applications Catapult to support the growth of the space sector we are required to provide regular impact and reporting mechanisms of the activities we undertake. This evaluation and reporting align to KPIs which focus more on the positive impact we achieve, than the revenue and turnover we generate. Our primary goal, and hence, the ambition to support the growth of the Space Cluster at Westcott, is to help the UK Space Sector grow domestically and internationally.

As part of this funding, we will allocate our Evaluation and Impact Manager to work alongside our Operations Board, to determine the optimum way to measure, capture and report the effectiveness of the DISC facility at Westcott. This will primarily focus on our target for 1,593 jobs, and £497m Net Additional Benefits.

Once the DISC is operational the governance will transfer to the Enterprise Alliance, introduced in Section 5.2.3. The Catapult will still maintain an active role but will take direction from the EA.

### 5.3.2 Project governance and assurance

As with Project Management, from Contract Award to DISC operational handover, the Project Manager is the nominated recipient of all agreements between the LEP and The Catapult and will ensure that all clauses in the contracts are adhered to. In the event of any changes to the funding use, contracts and/or scope the Project Manager will ensure this is escalated internally to our Strategic Projects Portfolio Manager and our Director of Delivery; alongside informing and agreeing any changes with the LEP at the earliest opportunity.

Key risks and issues are highlighted fortnightly to the Catapult Executive Management Team (EMT) via our Director of Delivery, and quarterly to our Catapult Board via the EMT. Ad-hoc risks, issues and changes that cannot be managed through the above escalation personnel are escalated to our EMT for decisions.

Project Boards are held with the Project Sponsor and key stakeholders and include a full agenda with items including schedule updates, latest financial position, key risks and issues and lessons learnt. Project Boards are in place for all relevant project stakeholders that are involved in key decisions.

The Project team will use proven assurance processes. The framework is intended to give confidence to the Business, our partners and to facility users that the investment in has been prioritised appropriately and is underpinned by sound and timely decision making.

At the heart of the Project delivery is regular reprioritisation of our equipment and capability priorities which align with customer demand. This is ratified by our Project Board providing a high level due diligence on deliverables. Each Project stage gate is intended to validate progress and provide regular review check points. In parallel to the gates, the benefits, costs and their alignment with the Projects Strategic Objectives are tested and reported so there is a strong audit trail.

### 5.3.3 Change management

DISC, by its very name – Disruptive Innovation for Space Centre, is designed to be organisationally agnostic. What DISC does is provide a specialist low volume, high quality manufacturing capability for organisations who intend to lease space for up to 24 months. Our approach to ensuring effective change management and organisation purpose includes:

- Designing change in from the outset – The Design methodology given to our professional services contracts sets out our requirement for DISC to have a fixed external shell, but an internal structure that needs to be flexible and allow for internal space to be reconfigured at a relatively low cost, and with minimum disruption to existing tenants. One example includes how we manage the mechanical and electrical configurations, and what we need to consider for Clean Rooms, Labs, and heavy specialist equipment.
- Understanding the requirements of potential new tenants - Our Technical Lead, Mike Curtis Rouse, will take time to understand their requirements, both in terms of space and equipment. This will then be reviewed to determine whether any professional services guidance is required with any costs incurred being added to the rental income for the tenant.
- Keeping DISC at the forefront of Innovation – To keep DISC as an attractive proposition to the market, it needs to be an attractive proposition to businesses. The Satellite Applications Catapult is a not-for-profit organisation; as such, all profits made from leasing the space in DISC will be reinvested into new start-of-the-art equipment. Introducing the Enterprise Alliance during the operational phase of DISC ensures it becomes a commercially sustainable enterprise. The multi-layered innovation environment of DISC provides the EA with opportunities to create an extensive range of commercial services and provides a compelling case for continuous investment by the EA in the DISC operation.
- Building the right culture for businesses as the Westcott Space Cluster grows – We want businesses who use DISC to remain at Westcott and support its continued growth and success.

Therefore, we need to facilitate and nurture a culture amongst those businesses. This will form part of the vision for Westcott as a Space Innovation Business Park and will build on the experience of the Catapult in helping grow the Space Cluster at Harwell since our inception in 2012. During our first six years at Harwell, working with organisations including the local landlord, STFC, UK Space Agency and the local LEP we have helped facilitate the growth of the community to 105 businesses. The Space Cluster at Westcott includes a number of the same partners who now have the track-record, lessons learned and ambition to succeed at Westcott. We have already begun this with the current facilities at Westcott, including the Business Incubation Centre and Future Networks Development Centre where we have begun to build a community ethos for our current tenants.

The Change process is therefore part of the project from inception. It will:

- Inform the landlord of building / scope changes to accommodate capabilities
- Ensure all requests are captured, costed, and approved.

This will follow a rigorous internal Change Management process. This ensures that all changes, outside the agreed scope and/or budget, are initially reviewed and agreed by the project and professional team. Once this initial review has taken place, the changes must be approved by the appropriate personnel; the Project Sponsor and the Director of Delivery or the Strategic Projects Portfolio Manager (dependant on thresholds of change value and type). This process ensures that all changes are robustly assessed against the backdrop of the DISC ambition and purpose, as well as the envelope in which the project needs to deliver.

If a change request is approved that impacts the building's construction, we will consult with the landlord so formal instruction can be given to the Contractor. This will then be updated in the Change Control Register where we track all Change Controls that have been submitted, approved, and disapproved.

From the outset, we expect some minor adjustments to the budget, for example we are aware of the impact of both Brexit and COVID on the availability and cost of building materials at this time. In addition, the designed flexibility of the internal space configuration and user needs linked to the equipment being purchased will mean some costs will vary to current thinking. We will allocate some budget to be drawn down as these decisions are finalised.

Our flexible approach means that we have identified the need for five procurement rounds. Each round will ensure that solutions are technically sound, and the facility is fit for purpose and equipment will seamlessly transition into the building.

Any changes required for the skills provision will be done by the Training / Operations provider in consultation with the Westcott Space Skills Working Group. The changes will ensure provision is in accordance with the Department for Education's guidance to ensure the continued safety and welfare of students.

Due to the safeguarding importance of the Centre, a member of the Steering Board will be on the Board of Governors for the Skills Academy.

## 5.4 Stakeholder management

### 5.4.1 Stakeholder engagement

Westcott stakeholder engagement commenced 18 months ago and will continue to develop and progress through every stage of this project. **Appendix 10 (DISC.A10.01)** captures the current stakeholder map. It is owned by the Catapult's Westcott Area Manager with updates being provided by the Catapult's Westcott Team.

Two plans will be created:

- DISC R&D: This will be maintained by the Westcott Area Manager and Project Manager
- DISC Skills: This will be maintained by the Westcott Space Skills Working Group which will include the Westcott Area Manager.



### 5.4.2 Partnership arrangements

As per Section 5.2.2 – contractual agreements will be in place to deliver this as a collaborative project.

Contracts (Heads of Terms, Collaborative Agreement, Agreement to Lease and the Lease) have already been drafted, and will be exchanged upon confirmation of funding.

### 5.4.3 Communications and marketing plan

The Catapult has prepared a Westcott 10-year plan brochure and has used this for regional and national consultation. The initial reaction has been highly encouraging with public and private sector stakeholders supportive of the ambition and approach. A full marketing and communications plan will be in place at the beginning of the project, including engaging with the stakeholders, informing the sector of opportunities, and ensuring ongoing feedback from the market.

Communications and Marketing Manager Izzy Taylor, with the support of the wider Marketing and Communications team, will work closely with the delivery team to ensure standards and consistency of key messages across internal and external stakeholders. This will be coordinated by the Project Stakeholder Plan.

Opportunities to engage and utilise capabilities will be marketed, ensuring the delivery team assess the demands and capability requirements. Adequate time has been allowed as part of each of the five procurement rounds, ensuring engagement, technical scoping and drafting of each tender is communicated widely.

For the skills uptake, in addition to the schools and business outreach and engagement, we will also develop a dedicated plan for parents and carers of young people.

## 5.5 Monitoring and evaluation

The project will adopt industry standard Life Cycle Management practice and will progress through a series of formal gate reviews at each stage of its development, Contract Acceptance, Design, Construction, Procurement, Installation, Integration, Test and Acceptance; Operational.

## 5.6 Risk management

Risk Management for the project will be conducted in accordance with the Satellite Applications Catapult Risk Management Plan. The Risk Management Plan sets out the activities necessary to evaluate and manage risks and their mitigation and resolution throughout the project.

Two plans will be created, one for DISC (including R&D requirements) specifically and a second for the Skills Academy. Our Project Manager will use two RIDAL's to capture the specific risks associated with the propulsion work and the skills environments.

All project stakeholders will have the responsibility to identify and categorise risks associated with the work and inform the Project Manager so that they can be captured in the Risk Register. A copy of the Risk Register for this project can be found in **Appendix 6 (DISC.A06.01)**.

Risks will be managed by the continuous identification, analysis and cost-effective control of all factors that might adversely affect the achievement of the project's aims. An iterative risk management process will be adopted:

- Identify potential uncertainties and risks in the Risk Register
- Review and refine register and assign quantitative ratings
- Management review and control of risk.

This process will be undertaken during project initiation and as part of the monthly operational board meetings. The progress and success of mitigation actions being performed will also be reviewed and

logged. In addition, ad-hoc reviews may be called by the project manager as required, especially if any risks with urgent or potentially large impacts are identified.

Issues will be managed similarly to risks in that an owner will be appointed, and a target resolution date assigned. As unresolved issues can have an impact on project performance, they will be monitored and reviewed by the Project Manager as part of the weekly reviews with the project team.

## C. Declarations

### C1. Document Confidentiality Statement

*Please confirm whether any information in this Business Case is commercially sensitive and considered exempt from release under Section 41 of the Freedom of Information Act 2000. If so, please provide details.*

### C2. Declarations

Has any director/partner ever been disqualified from being a company director under the Company Directors Disqualification Act (1986) or ever been the proprietor, partner or director of a business that has been subject to an investigation (completed, current or pending) undertaken under the Companies, Financial Services or Banking Acts?	No
Has any director/partner ever been bankrupt or subject to an arrangement with creditors or ever been the proprietor, partner or director of a business subject to any formal insolvency procedure such as receivership, liquidation, or administration, or subject to an arrangement with its creditors	No
Has any director/partner ever been the proprietor, partner or director of a business that has been requested to repay a grant under any government scheme?	No

If the answer is “yes” to any of these questions please give details on a separate document of the person(s) and business(es) and details of the circumstances. This does not necessarily affect your chances of being awarded BLEP funding.

### C3. Senior Responsible Owner Declaration

As Senior Responsible Owner for DISC at Westcott I hereby submit this request for Government funding on behalf of Satellite Applications Catapult and confirm that I have the necessary authority to do so.

In making this application, I agree that the information provided by me in this application is to the best of my knowledge correct. I understand that if I give information that is incorrect or incomplete, funding may be withheld or reclaimed and action taken against me. Any expenditure defrayed in advance of project approval is at risk of not being reimbursed and all spend must be compliant with the Grant Conditions and State Aid requirements.

I understand that this application does not form or imply any contract to provide funding.

I am content for information supplied here to be stored electronically, shared with the BLEP Independent Technical Evaluator, and other parties who may be involved in considering the business case to enable enquiries on this application so as the BLEP can satisfy themselves of its completeness and accuracy.

I understand that a copy of the main Business Case document will be made available on the BLEP website. The Business Case supporting appendices will not be uploaded onto the website. Redactions to the main Business Case document will only be acceptable where they fall within a category for exemption. Where scheme promoters consider information to fall within the categories for exemption

**C3. Senior Responsible Owner Declaration**

they should provide a separate version of the main Business Case document, which highlights the proposed Business Case redactions.

I understand that any offer may be publicised by means of a press release giving brief details of the project and the grant amount.

**Name:** Alan Cox

**Position:** Chief Commercial Officer

**Date:** 14<sup>th</sup> September 2021

**Signed:**


**C4. Section 151 Officer / Chief Financial Officer Declaration**

As Section 151 Officer (or Chief Financial Officer) for DISC at Westcott I hereby agree that this request for Government funding on behalf of Satellite Applications Catapult is financially compliant and confirm that I have the necessary authority to do so.

I declare that the project cost estimates quoted in this application are accurate to the best of my knowledge and that [Satellite Applications Catapult]:

- has allocated sufficient budget to deliver this project on the basis of its proposed funding contribution;
- has undertaken a risk assessment which identifies all substantial project risks known at the time of Business Case submission and this is included within the cost estimate;
- accepts responsibility for meeting any costs over and above the BLEP contribution requested, including potential cost overruns and the underwriting of any funding contributions expected from third parties;
- accepts responsibility for meeting any ongoing revenue requirements in relation to the project;
- accepts that no further increase in BLEP funding will be considered beyond the maximum contribution requested;
- confirms that the authority has the necessary governance / assurance arrangements in place and the project has met our assurance guidelines; and
- funding is compliant with central government guidance; and
- confirms that the procurement strategy for the project is legally compliant and is likely to achieve the best value for money outcome.

**Name:** Richard Tuffill

**Position:** Chief Financial Officer

**Date:**

**Signed:**

## E. Appendices

### List of Appendices

#### **I. Reference**

- a. Definitions and acronyms
- b. Additional resources

#### **II. Templates**

1. Options appraisal: critical success factors
2. Options appraisal: longlist
3. Options appraisal: cost-benefit analysis of shortlisted options
4. Output and outcomes forecast profile (excel spreadsheet, supplied separately)
5. Funding profile (excel spreadsheet, supplied separately)
6. Risk register (excel spreadsheet, supplied separately)

#### **III. Further appendices as applicable**

- Logic Model
- Project map 1 (location)
- Project map 2 (site plan)
- Feasibility studies
- Relevant organisational strategic documents
- Industry-relevant stage reports and plans
- Environmental Impact Assessment
- Distributional impact appraisal
- Confirmation of match funding (conditional or full)
- Statement of financial viability
- Detailed cost plans
- Consultation reports
- Project programme
- Communications plan
- Monitoring & Evaluation plan
- Organisation organogram
- Project organogram
- Procurement contract (at FBC)
- Letters of support / Memoranda of Understanding from project stakeholders



**Appendix A – Definitions and acronyms**

BCR	Benefit - Cost Ratio
BEIS	Department for Business, Energy and Industrial Strategy
Benefits	Positive economic, social and environmental impacts expected to be realised as a result of the project being delivered. This is in addition to what is considered business as usual
CBA	Cost - Benefit Analysis
Delivery Plan	A detailed, typically sector specific, plan to support the delivery of the BLEP Strategic Economic Plan
DfT	Department for Transport
EoI	Expression of Interest
FBC	Full Business Case
GVA	Gross Value Added
HMT	Her Majesty's Treasury
LIS	Local Industrial Strategy
MHCLG	Ministry for Housing, Communities and Local Government
NPV	Net Present Value
OBC	Outline Business Case
Optimism Bias	The proven tendency for appraisers to be too optimistic about project costs, duration and benefits delivery, which require adjustments to correct for
Outcomes	<p>Direct outcomes are the short- and intermediate-term effects or changes that occur or will occur as a direct result of the project activity.</p> <p>An indirect outcome is the intermediate to long-term effect or changes of a project, i.e. the longer term consequence of the project. They may be expected to follow the project activity, but cannot be guaranteed due to a range of factors.</p>
Outputs	Outputs are usually pre-defined (e.g. a target) and can be accurately measured (e.g. a number). Outputs are sometimes referred to as deliverables – they are the direct, immediate-term, quantifiable results associated with a project.
QRA	Quantitative Risk Assessment
SEP	Strategic Economic Plan
SOC	Strategic Outline Case
SRO	Senior Responsible Owner
WebTag	DfT's Transport Appraisal Guidance that provides information on the role of transport modelling and appraisal

## Appendix B – Resources

BLEP Strategic Economic Plan

<https://www.buckstvillep.co.uk/wp-content/uploads/2018/07/SEP-refresh-2.pdf>

BLEP Assurance Framework

<https://www.buckstvillep.co.uk/about-us/our-governance/>

Buckinghamshire Local Industrial Strategy

<https://www.buckstvillep.co.uk/our-strategies/local-industrial-strategy/>

Oxford to Cambridge Arc Economic Vision

<https://www.buckstvillep.co.uk/our-strategies/oxford-cambridge-arc/>

HM Treasury Green Book: Central Government Guidance on Appraisal and Evaluation

<https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government>

HM Treasury Green Book: Guide to Developing the Project Business Case

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/749086/Project\\_Business\\_Case\\_2018.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/749086/Project_Business_Case_2018.pdf)

Department for Communities and Local Government: Appraisal Guide

<https://www.gov.uk/government/publications/department-for-communities-and-local-government-appraisal-guide>

Department for Transport: Transport analysis guidance

<https://www.gov.uk/guidance/transport-analysis-guidance-webtag>

HM Treasury Magenta Book: Guidance for Evaluation

<https://www.gov.uk/government/publications/the-magenta-book>

HM Treasury Orange Book: Management of Risk – Principles and Concepts

<https://www.gov.uk/government/publications/orange-book>

Management of Risk in Government: Framework

<https://www.gov.uk/government/publications/management-of-risk-in-government-framework>

End of document.