

SUSSEX BIO-INNOVATION CENTRE
BUSINESS CASE

Appendix 1

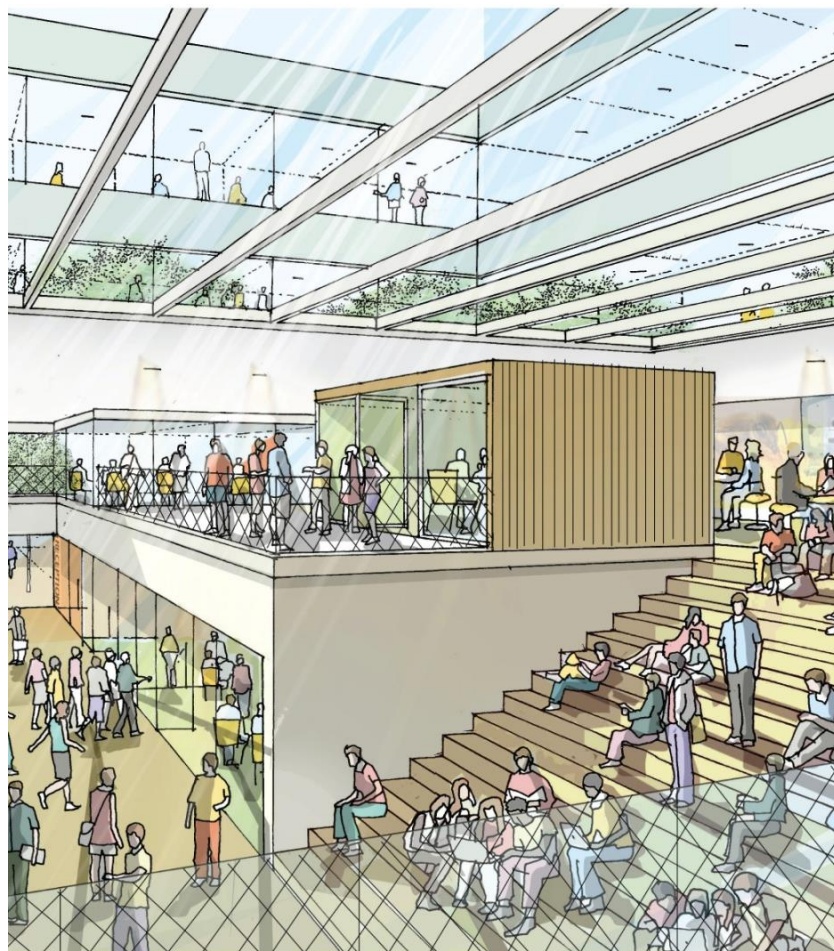
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Contents

Executive Summary	4
Strategic Case	7
Business Case	14
The Project	18
Options Appraisal	24
Delivery	26
Financial Profile	28
Management Arrangements	29

“Our vision is to create a distinctive, world-class bio-innovation centre at the University of Sussex’s Falmer Campus to stimulate and accelerate growth in the life science sector across the Coast to Capital region. The Sussex Bio Innovation Centre will bring biomedical researchers, bioscience entrepreneurs and pharmaceutical companies together in shared, well equipped spaces with all the support facilities and infrastructure that are needed for life sciences innovations to be translated into new, high value products, processes and services”.

Professor Michael Davies, Pro Vice-Chancellor (Research), University of Sussex



Executive Summary

The University of Sussex is proposing to use Local Growth Funding to develop a Bio-Innovation Centre within the new Life Science campus at Falmer. The Centre will provide a dynamic environment in which entrepreneurs and companies in the Life Sciences sector can share and develop their ideas and technologies.

The Greater Brighton City Region has all the assets to be one of the UK's top performing areas: a highly skilled workforce, an innovative business community and two high quality universities. However, its contribution to the UK economy does not yet match these assets. The primary economic challenge (set out in the Greater Brighton Devolution Proposal) is to raise productivity to a level which reflects the area's economic potential, particularly in terms of providing higher value employment opportunities. The Sussex Bio-Innovation Centre project responds to this through creating an environment that supports the creation of higher-level jobs so that employment opportunities better reflect the skills of an increasingly youthful and qualified population and opportunity sectors in the region.

This Business Case relates to an application for Local Growth Funding to develop a new Life Sciences campus building at the University of Sussex Falmer site incorporating the Sussex Bio-Innovation Centre, which will become the hub of the University's leading life sciences and biomedical research and the growth base for bioscience entrepreneurs and pharmaceutical companies. The Life Sciences campus will create a transforming innovation resource providing the infrastructure, support facilities and advanced technological expertise to help entrepreneurs and businesses translate innovations and investment into new products, processes and services utilising the University's life science research expertise. The project aim is to stimulate and accelerate the growth and development of the Life Sciences sector in the south east, specifically biomedical research, bioscience entrepreneurs and pharmaceutical companies.

The project is identified in the Strategic Economic Plan (SEP) as a key intervention project to develop Life Sciences in the region and is closely aligned to the Coast to Capital Economic Plan. It will help deliver specific priorities, including:

The Sussex Bio-Innovation Centre builds on the current business incubation facilities at the University of Sussex enhancing it as a **Successful Growth location** as part of the network of Growth Hubs.

Successful Business – the Bio-Innovation Centre will deliver increasing levels of enterprise and entrepreneurship by creating specialist support and laboratory facilities for new biotech and pharma businesses. The project will specifically address the shortage of specialist business space which promotes and stimulates links between research, higher education, entrepreneurs and businesses. The project will support export-led businesses.

Building Competitive Advantage – the new Life Sciences facility, incorporating the Sussex Bio-Innovation Centre, will enable new Intellectual Property developments in Bio and Medical Sciences and encourage interactions between new businesses and academic researchers to encourage knowledge transfer and research commercialisation.

The Life Sciences building will provide high quality scientific and business jobs on the campus and support **Skills and Workforce Development** in the key health and life sciences sector.

The new facility will support bioinformatics and digital-health research and new businesses. This is an important aspect of the **Growth is Digital** priority.

The University of Sussex already plays an active role in the local, regional and national economies. The School of Life Sciences has played a pivotal role in establishing the University's reputation as one of the leading institutions in the UK. The School, which has an annual research budget of £13 million, has a faculty of over 60, a staff of 86 and over 330 Research Fellows and Technicians. The University is investing over £90 million in a new Life Sciences campus building, which will be a place where focused inter-disciplinarity will flourish, with molecular biologists working alongside neuroscientists, and cancer biologists collaborating with chemists, sharing knowledge and building creative partnerships. It will be a training ground for researchers providing a dynamic and stimulating environment in which entrepreneurs and companies in the life sciences sector can share and develop their ideas and technologies. The new campus building will provide:

- Modern laboratory equipment accommodating 70-80 research groups;
- Inspiring communal and collaboration space giving academics, businesses and clinicians the opportunity to meet and interact;
- Integrated accommodation for the technical support facilities that will underpin the research excellence;
- Dedicated teaching space, and
- The Sussex Bio-Innovation Centre

A key component of the new Life Sciences campus will be the development of the Sussex Bio-Innovation Centre, which will reinforce Sussex's global reputation in this field. Building on the success of the Sussex Innovation Centre, the Sussex Bio-Innovation Centre will provide a much-needed new facility for entrepreneurs and businesses in the Coast to Capital region's developing Life Sciences sector providing an enabling infrastructure to test new ideas, share expertise and develop new commercial products within a first class university setting. The Centre will be a key element of Life Sciences development at the university, providing a research and development interface between academia and business to foster the next generation of pharma and biotech companies.

The shortage of quality laboratory space has been consistently identified as an inhibitor to nurturing and growing high-value knowledge based industries in Greater Brighton. The 2,202sqm Sussex Bio-Innovation Centre¹ will provide dedicated accommodation and access to high-end equipment, shared services, business support and investment for new and growing bioscience businesses. As well as bespoke laboratory accommodation, the Centre will have specialist equipment, processing facilities, expertise and personnel to meet the needs of different types of Life Sciences businesses, including:

- University spin-off activity
- Entrepreneurial start-ups
- Research labs for established bioscience and lifescience businesses to develop new products
- Emerging bio-science enterprises from the NHS and Research Institutes
- Contract Research Organisations (CROs) and Specialist Consultancy companies, using the Bio-Incubator laboratory and capital equipment to deliver cutting edge research
- University staff and students undertaking collaborative specialist business research projects

The flexible and modular laboratory design will enable an evolving mix of Life Sciences companies to use the Centre and its clear focus will provide a strong sense of coherence, identity and confidentiality for commercial researchers from within the sector.

The £99 million Life Sciences campus incorporating the Sussex Bio-Innovation Centre will provide a new focus for world-leading research for life sciences activity in the region as well as providing a support infrastructure for entrepreneurs, university spin-outs and established businesses in the sector. The proposal £9,120,000 Local Growth Funding will deliver:

- 2,202sqm of dedicated specialist accommodation
- Support for 20 new life sciences business teams at a time
- Over 60 specialist bio-science graduate-level jobs plus additional senior business staff
- A further 20 specialist bio-science technician, business support and management positions
- 630 academic and teaching jobs accommodated within the new Life Sciences building of which 147 will be new indirect jobs
- Annual Gross Value Added (GVA) impact of over £10m based on new jobs created

¹ The design and final size of the Bio-Innovation Centre is still evolving

1. Strategic Case

1.1 International Trends and Drivers

Growth in each of the three main components of the Life Sciences sector (Pharmaceuticals, Biotechnology and Medical Technology) is closely linked to countries' economic strength and levels of healthcare spending. Globally, healthcare systems face growing challenges from ageing populations, an increasing burden of chronic disease (fuelled by urbanisation, sedentary lifestyles and changing diets) and a greater demand for better quality, personalised services. By 2018, 10% of the global population (and 20% of the western European population) will be aged 65 years and over. This is significant because older people, on average, consume three to five times more health care resources than younger people.

It is within the context of growing demand that Governments are under pressure to control healthcare costs by investing in value (based on 'real-world' evidence), rather than volume. There will be a need to deliver healthcare products and services more cost-effectively within an increasingly competitive global market. This, and the increasing application of digital technologies, is driving the demand for innovation within the life sciences sector.

Nevertheless, global healthcare spending is expected to grow by an annual average of 5.2 percent between 2014 and 2018², with the most rapid growth expected to occur in the Middle East and Africa (8.7%). Pharmaceutical sales are forecast to increase annually by 6.9%, biotechnology sales by 9.0% and medical technology sales by 5.0% over the next few years. Deloitte's Global Life Sciences Outlook report for 2015 suggests that there are four major trends driving the industry:

- Searching for innovation and growth;
- Changing regulatory and risk environment;
- Preserving and building shareholder value; and
- Preparing for the "next wave", including using digital technology, big data and analytics to advance product development.

These trends are driving governments in emerging markets to invest in their life sciences industries, with R&D activities from developed economies starting to be outsourced to them³. Within developed countries, R&D is increasingly the result of collaborative agreements between large companies and/or academic institutions and SMEs. Personalisation of products and the growing importance of 'real world' evidence are further driving closer collaboration between healthcare providers and life science companies.

²World industry outlook: Healthcare and pharmaceuticals, The Economist Intelligence Unit, May 2014

³IBISWorld Industry Report: Global Biotechnology, July 2014. www.ibisworld.com

All these changes and the emergence of inter-disciplinary approaches to product development offer opportunities for innovation, but they create human resource challenges for businesses in the sector.

These include finding, accessing and developing employees who have the skills that are needed. According to Deloitte, there is a pressing need for organisations to maximise the value of science; source or locate talent hubs; explore relationships with educational institutions; and foster a culture that encourages continuous learning⁴.

The ability to rapidly adopt and commercialize new technological and clinical discoveries will be essential to gaining a competitive advantage. This is expected to include digital technology, big data, and analytics to advance product development.

1.2 The UK's Bio-Innovation Position

The UK has one of the strongest and most productive life sciences⁵ industries in the world. It employs 183,000 people, has an annual turnover of £56bn and has around 4,400 businesses⁶. The pharmaceuticals sector alone accounts for more UK-based business R&D than any other manufacturing sector (accounting for over 28% of all business R&D) and, as one of the country's leading export sectors, it makes a particularly important contribution to the UK's trade balance. The UK is also a world leader in genetic and genome sciences, which are set to revolutionise the way medicine is practised and change the way in which diseases are diagnosed, prevented and treated.

There is a shift towards more collaborative ventures in the industry, with small, niche biotech businesses driving innovation and discovery and pharmaceutical manufacture being out-sourced to contractors producing more tailored products in relatively low volumes. The proximity of 'discovery' companies and aligned universities to contract manufacturers may be a key factor in investment decisions.

The strength of the sector in the UK, combined with its world-class research institutions and the unparalleled resource of the NHS, make it well placed to take advantage of the immense opportunities globally. The NHS is the world's largest centralised healthcare system and is, therefore, a "unique selling point" for companies looking to locate in the UK. Its scale means that there is significant scope for clinical trials and for testing products and services for the health care sector - the NHS runs over 200m laboratory tests each year.

⁴ 2015 Global Life Sciences Outlook – Adapting in an Era of Transformation - Deloitte

⁵ SIC 2007: *Manufacture of basic pharmaceutical products and pharmaceutical preparations; Manufacture of irradiation, electro-medical and electrotherapeutic equipment; Manufacture of medical and dental instruments and supplies; Research and experimental development on biotechnology*

⁶ HM Government: Strength & Opportunity 2014 – the landscape of the medical technology, medical biotechnology, pharmaceutical and industrial biotechnology sectors in the UK

Recognising these strengths and their commercial potential, the Government set out its ten-year *Strategy for UK Life Sciences* in 2011, with the aim of making the UK “the global hub for life sciences”. The Strategy is underpinned by three key principles:

- **Building a life sciences ecosystem** by building on existing strengths and partnerships between universities, the wider research base, businesses and the NHS to establish a cohesive system of integration.
- **Attracting, developing and rewarding the best talent** by nurturing highly skilled researchers, clinicians and technicians and assisting them to work collaboratively across traditional boundaries to create value throughout the ecosystem.
- **Overcoming barriers and creating incentives for the promotion of healthcare innovation** by creating the right environment to translate discovery into real benefits for patients and to nurture innovation through the translational funding gap, whilst at the same time reducing regulatory bureaucracy to provide a route for early adoption and diffusion in the NHS.

It aims to make it easier to commercialise academic research; to put clinical research at the heart of innovation in the NHS; to encourage adoption and diffusion of innovation; and to promote the UK as the place to invest and deliver life sciences innovation.

However, the strategy argues that it has become increasingly challenging for life sciences companies to discover, develop and commercialise medical innovation and that in order to achieve its vision there must be a better level of leadership, entrepreneurialism and business skills within the sector. This includes developing much stronger links between education programmes and industry, particularly with life sciences SMEs, where commercial skills are most likely to be lacking.

The one-year review of the strategy highlights numerous examples of where Government investment has supported collaborations between universities and life science businesses in different parts of the country including in Oxford, Cambridge Manchester, London, Dundee, Nottingham, Belfast, Leeds, Newcastle, Liverpool and Birmingham.

1.3 Growth Potential in the Coast to Capital Region

The Coast to Capital region has both established and emerging strengths in the Life Sciences sector, which has been identified as a priority sector for the Coast to Capital Local Enterprise Partnership (LEP). According to the Coast to Capital LEP Strategic Economic Plan (SEP), the Coast to Capital region has important strengths in pharmaceuticals and is a market leader in Medical Instruments and Devices. More than 2,300 people are employed in pharmaceutical, medicinal chemicals and botanical products businesses and a further 3,200 employed in businesses that manufacture medical and surgical equipment and orthopaedic appliances. Around one in ten of all people in Britain who are employed in the manufacture of medical instruments and devices work in the Coast to Capital LEP area.

Developing a Bioengineering Centre of Excellence is one of West Sussex County Council’s five ‘Bold Ideas’ to drive local economic growth; and the Greater Brighton Devolution

Prospectus is centred on extending the presence of the universities and “commercialising their expertise in digital media, nanotechnology, big data, regenerative medicine and the recycling of economically critical materials”.

The Sussex Bio-Innovation Centre project and broader Life Sciences campus development by the University of Sussex is identified in the SEP as a key intervention project to develop Life Sciences in the region and is closely aligned to the Coast to Capital Economic Plan. It will help deliver specific priorities, including:

- The Sussex Bio-Innovation Centre builds on the current business incubation facilities at the University of Sussex enhancing it as a **Successful Growth location** as part of the network of Growth Hubs. The Coast to Capital LEP recognises the need for a “targeted approach to investment in R&D” within the sector and has plans to establish a “network for innovation with the Kent, Surrey and Sussex Academic Health Science Network”. The Life Sciences campus and Bio-Innovation Centre will be a unique facility in the area to support businesses in the Life Sciences sector, which is a priority for the LEP.
- **Successful Business** – the Bio-Innovation Centre will deliver increasing levels of enterprise and entrepreneurship by creating specialist support and laboratory facilities for new biotech and Pharma businesses. The project will specifically address the shortage of specialist business space which promotes and stimulates links between research, higher education, entrepreneurs and businesses. The project will support export-led businesses.
- **Building Competitive Advantage** –the new Life Sciences facility, incorporating the Sussex Bio-Innovation Centre, will enable new Intellectual Property developments in Bio and Medical Sciences and encourage interactions between new businesses and academic researchers to encourage knowledge transfer and research commercialisation. The Sussex Innovation Centre plays a key role in developing research commercialisation opportunities with the University of Sussex which operates a Proof of Concept Funds for such projects.
- The Life Sciences building will provide high quality scientific and business jobs on the campus and support **Skills and Workforce Development** in the key health and life sciences sector.
- The co-location of the Bio-Innovation Centre with the Life Science School teaching and Research space will directly promote local high-level scientific employment opportunities to our graduating students.
- The new facility will support bio-informatics and digital-health research and new businesses. This is an important aspect of the **Growth is Digital** priority and an area of specialism within the University.

In addition, the project will assist drive forward a number of growth opportunities and key drivers for the sector in the Coast to Capital region. Coast to Capital LEP highlights the emergence of the Sussex and Brighton University Hospital as a leading medical school, with substantial investment in academic oncology; the University of Sussex’s established reputation for life sciences, the University of Brighton’s pharmacy and pharmacology

strengths, and the £420m redevelopment of Royal Sussex County Hospital as a nationally important trauma centre as key drivers of the sector within the region.

The region has several large life sciences businesses, including Novo Nordisk UK, Elekta, Varian Medical Systems and Roche Diagnostics, Glaxo SmithKline, Allergy Therapeutics and Custom Health Group. There are also a number of small, niche life sciences companies and University spin-offs that are working with the Sussex Innovation Centre on the University of Sussex campus, including

- **Destiny Pharma** conducts research within the pharmaceutical R&D business sector in order to develop patented therapeutic pharmaceutical technologies. Destiny Pharma is currently conducting clinical trials for a new series of anti-bacterial drugs. Further information can be found at: www.destinypharma.com
- **Enterprise Therapeutics** Enterprise Therapeutics is a drug discovery company dedicated to the research and development of novel therapies for the treatment of respiratory diseases. Have recently raised £4 million for clinical development. www.enterprise-therapeutics.com.
- **Clearanail**, a new patented medical device technology for the treatment of fungal toe nail. www.clearanail.com
- **Sussex EP Sensors, which** are being developed for medical applications in ECG and EEG applications through a partnership with Plessey and could help enhance MRI and NMR scanning techniques in hospitals⁷.
- **Sciensus**, which provides health informatics services, mainly to pharmaceutical companies and the NHS, which was acquired by Healthcare at Home in 2011⁸;
- **Rayner** designs and manufactures intraocular lenses and proprietary injection devices for use in cataract surgery. They are the only manufacturer of intraocular lenses in the UK. They have a research facility at the Sussex Innovation Centre. www.rayner.com
- **Cells4Life** which provides a service to enable cryopreservation of stem cells via umbilical cord blood collection and storage. Cells4Life offers the only storage facility of this type in the UK. www.cells4life.co.uk
- **One Research** developing new techniques for the selection and maintenance of patients for clinical trials. www.oneresearch.co.uk
- The **Sussex Ingestion Pattern Monitor (SIPM)** system, a University Spin-Out which facilitates detailed collection and analysis of human food intake behaviour (eating); www.sipm.co.uk
- **PsephosBiomedica** a new consultancy providing consultancy for clinical trials and regulatory compliance for new medical devices.
- **Cool Technologies Group** owns of patents and IPR for a for an endothermic cooling reaction in protective headgear, such as motorcycle crash helmets, for example, but also applications in medical trauma. Further information can be found at: www.thermahelm.com
- **Pastel BioScience** is developing a biomarker discovery and proteomics platform technology for pharmaceutical and biotechnology companies.

⁷<http://www.plesseysemiconductors.com/epic-healthcare-plessey-semiconductors.php>

⁸<http://www.prnewswire.co.uk/news-releases/healthcare-at-home-ltd-acquires-health-informatics-specialists-sciensus-ltd-156322115.html>

The Coast to Capital LEP recognises the need for a “targeted approach to investment in R&D” within the sector and has plans to establish a “network for innovation with the Kent, Surrey and Sussex Academic Health Science Network”.

Market failures in its key priority sectors need addressing “using higher education and business bodies to create a nucleus of innovation in which SMEs can get involved”. It sees its role as a “catalyst for innovation networks, providing leadership where necessary” and its proposed activities include: Cluster-building programmes; encouraging networking and collaboration; developing shared research infrastructure; stimulating local innovation; and promoting knowledge transfer networks amongst innovative businesses.

1.4 University of Sussex Life Sciences Expertise

The University of Sussex has an established reputation in life sciences, psychology, biomedical sciences and neuroscience. Life Sciences is the largest School in the University of Sussex, with over 60 faculties, 330 research fellows and technicians and more than 150 PhD students. The biological sciences research was ranked 10th in the UK overall in the Research Excellence Framework (REF) 2014 and equal 8th on the quality of research publications, placing the university ahead of Cambridge, UCL and Kings College London.

The University is home to some of the UK’s leading Biomedical and Life Sciences researchers, who are at the forefront of research in a number of specialist life sciences and biomedical research centres, including:

The Genome Damage and Stability Centre: Scientists from different disciplines at the Centre for Genome Damage and Stability investigate the protective processes that prevent DNA damage, for example in skin cells by sunlight or in intestinal cells by carcinogens in food. Identifying and diagnosing faulty DNA repair systems can lead to interventions that can reduce the incidence of cancer and gain a better understanding of how and why different forms of cancer develop.

The Sackler Centre for Consciousness Science: The Sackler Centre for Consciousness Science brings together consciousness researchers from Psychology, Psychiatry, Computer Science and Artificial Intelligence, Neuroscience, and Cognitive Science. Its research focuses on neuropsychiatry and brain-injured patients with neurological deficits with the aim at informing new clinical interventions.

The Clinical Imaging Sciences Centre: This is a joint venture between the University of Sussex and the University of Brighton through the Brighton & Sussex Medical School. The School of Psychology and the School of Life Sciences at the University of Sussex facilitates cutting-edge, world-class research into areas as diverse as addiction,

emotion, consciousness, psychophysiological mechanisms, neurological disorders, cognitive and social performance, inflammatory disorders, cancer, dementia and Alzheimer's Disease. It also delivers diagnostic imaging services in the fields of Positron Emission Tomography/Computed Tomography (PET-CT and CT) and Magnetic Resonance Imaging (MRI) to patients from the Brighton and Sussex NHS Trust and other sectors.

The Centre for Computational Neuroscience and Robotics: This an interdisciplinary research group aimed at encouraging a two-way flow of ideas and methods between life sciences and computer science. Topics have included modelling and analysis of insect navigation, neuronal circuits and evolutionary theory, for example.

A key part of the long term vision for Life Sciences research at University of Sussex is the development of a new state-of-the-art building for Life and Biomedical sciences, which will help transform the way the University works, is a key component of the long term vision for Life Sciences research at the University. With a £60m capital cost and scheduled opening in September 2018, the new building will be a place where focussed interdisciplinarity will flourish, with molecular biologists working alongside neuroscientists, and cancer biologists collaborating with chemists, sharing knowledge and building creative partnerships. A key aspiration is to provide a research and development interface between academia and business and support infrastructure to foster the next generation of pharma and biotech companies through utilising the research and development activities and opportunities presented within the new building.

A key component of the new Life Sciences campus will be the development of the Sussex Bio-Innovation Centre, which will reinforce Sussex's global reputation in this field. Building on the success of the Sussex Innovation Centre, the Sussex Bio-Innovation Centre will provide a much-needed new facility for entrepreneurs and businesses in the Coast to Capital region's developing Life Sciences sector providing an enabling infrastructure to test new ideas, share expertise and develop new commercial products within a first class university setting. The Centre will be a key element of Life Sciences development at the university, providing a research and development interface between academia and business to foster the next generation of pharma and biotech companies.

2. Business Case

2.1 Addressing Local Need: Raising Productivity

The Greater Brighton City region has all the assets to be one of the UK's top performing areas – a highly skilled workforce, an innovative business community and two high quality universities – but its contribution to the UK economy does not yet match these assets. Its primary economic challenge, set out in the Greater Brighton Devolution Proposal, is to raise productivity to a level which reflects the area's economic potential. The development of a new Life Sciences campus and creation of the Bio-Innovation Centre aligns with the Greater Brighton Devolution Prospectus and reflects the ambition to provide platforms to grow productivity and accelerate economic growth. Although the sector does not currently provide a high volume of jobs for the area, the employment that the health and life sciences sector does provide is often high skilled, well-paid and businesses are export and R&D oriented. The latest figures released by the ONS show that the GVA generated per employee within the pharmaceuticals industry is significantly higher than other comparable sectors.

Greater Brighton's productivity, whilst comparable to the UK average, is not what it should be for its proximity to London and asset base. More than half of all jobs in the area are in tourism, retail and public sector industries, well above the national average. There is a highly skilled workforce but a high proportion is under-employed. The Life Sciences campus and Bio-Innovation Centre will make a significant contribution in creating a positive environment to grow the life sciences sector, creating high-quality jobs which reflect high skill levels and university-business collaboration.

Greater Brighton still has a shortage of graduate level and higher value jobs and average workplace earnings are below of the South East and national averages. This results in high levels of out-commuting, particularly northbound towards London. The Bio-Innovation Centre project responds to this through creating an environment that supports the creation of higher-level jobs so that employment opportunities better reflect the skills of an increasingly youthful and qualified population and opportunity sectors in the region.

2.2 The Life Sciences sector: Business need

The Life Sciences sector is characterised by a number of specific features, which distinguish it from many other markets and demonstrate the need for public intervention, including:

- Long product development timescales;
- High research and development intensity;
- High development costs and up-front investment;
- Unique intellectual property rights, and
- Distinct funding cycle in product development.

The research in developing this application has identified a number of business challenges and market failures many of which have been identified at a national level:-

2.2.1 Physical space – supply and demand

Medical and bioscience firms need high quality laboratory and workshop space and this is relatively expensive compared with standard office space. The development of independent high specification laboratory workspace for early stage / small bioscience businesses can be prohibitively expensive for individual businesses and business park developers. Therefore these facilities are rarely built on a straight commercial basis.

There is limited / no supply of such provision, specifically wet lab space, within the Greater Brighton area. In addition, relationships between academics, businesses and clinicians are crucial for these firms as is specialised business support. This means that a standard commercial property offer is not usually suitable for firms in this sector.

The shortage of quality laboratory space has been consistently identified as an inhibitor to nurturing and growing high-value knowledge based industries in Greater Brighton. The Greater Brighton & West Sussex Business Survey (2014) suggested that both Health informatics and Genetics have the potential to grow quite significantly, but the availability of suitable premises has been identified as a key barrier to growth and that businesses thought that local collaborative networks within the sector could be strengthened. It is a particular challenge for businesses in the Life Science sector.

“Many local authorities do not cater for our type of business. They focus on warehousing and retail.” Life Science SME Greater Brighton & West Sussex Business Survey 2013

Bioscience laboratory and workshop space also require specialist services and technical support, such as the provision of hazardous chemicals and gases, the handling of clinical waste and the management of health and safety within laboratory environments. It can be cost prohibitive to provide such facilities on a small scale, therefore co-locating with the Life Science school makes economic sense.

2.2.2 Specialist business support

The Life Sciences sector is knowledge intensive. There are distinct hurdles to overcome for companies entering a medical or healthcare market where timescales are long and costs are high. This means that start-ups have particular difficulties surviving and existing businesses are inclined to minimise risks by continuing their existing products, services and markets. For the sector to grow, it is essential that support is available to enable start-ups to flourish and existing businesses to grow through innovation. Linking the development with the provision of a new Life Science campus and Research facility will allow accessibility to high

value scientific equipment and academic expertise that is normally out of the reach of early stage businesses. Developing the community of bioscience businesses within the region creates the critical mass that attracts the specialist support expertise and professional skills.

2.2.3 Funding

The Life Sciences sector is one where funding challenges related to start-up and growth are particularly acute. Biomedical and pharmaceutical products are high risk ventures. To assure efficacy and safety, clinical tests and trials are required and are both expensive to carry out and time consuming. Regulation for testing is changing and is likely to be tightened in the near future.

2.2.4 Collaborative working

The University has a number of specialist life sciences and biomedical research centres and there are 15 biomedical companies or products based at the Sussex Innovation Centre, a wholly-owned subsidiary which is one of the UK's most successful catalysts for bringing together University expertise with external partners and investors. Key to the success of these collaborations is the creation of an innovative and collaborative community that enables the cross-fertilisation of new business ideas, technologies and experience across sectors and between business and academia. In addition to its strong Life Science research, Sussex has significant assets in business and management, psychology, informatics, engineering, maths and physics all of which feed into the development of new bio-medical techniques and businesses.

If medical and healthcare related innovations are to be researched, developed and taken to market, relationships need to be built between academics, businesses and clinicians – sometimes referred to as 'ABC' relationships. This is for a number of reasons including understanding need, access to specialist equipment or for collaboration in order to take advantage of expertise and approaches. Collaboration between stakeholders and enablers will help a business to navigate the difficult route to market in the sector.

2.2.5 Strengthening the role of the University of Sussex

The University of Sussex is internationally recognised for its world-class research across many subjects. Much work has been done to raise awareness of Sussex and the Coast to Capital region as a vibrant hub for the medical and bioscience sector. However, there is no doubt that the external perception is still that the East of England and London are the locations where activity is most intensive. Recognition of the strength and application of the Life Science sector is essential in order to attract inward investment, Venture Capitalist interest, future partners for collaboration, trade and talent.

2.2.6 Expanding international trade

The UK faces increasing competitive pressure from emerging countries, such as China and India, where R&D activities can be carried out at a relatively lower cost. This is leading to some life sciences companies in the UK outsourcing an increasing part of their research and manufacturing activities in an attempt to reduce costs and become more competitive. The University of Sussex is one of Greater Brighton's major exporters and one of its highest profile international businesses. Its staff and academics are drawn from over 120 countries from around the world and its academic activities provide it with unparalleled access to global networks. The Life Sciences sector has a particularly strong international dimension, with pharmaceuticals, in particular, contributing to the UK trade balance. The Coast to Capital LEP has identified increasing international trade as a key regional priority and the extension and development of the Life Sciences sector at the University of Sussex would make a significant contribution to this.

2.3 Addressing market failure

The Life Science campus incorporating the Sussex Bio-Innovation Centre has been designed to address market failure and build on the opportunities presented by the Life Sciences sector. The capital cost of providing laboratory space means that companies and science park developers struggle to find and fund such facilities. An award of Local Growth Fund money will provide the catalyst required to provide the physical interface and create a highly networked community of academics, businesses and clinicians. Together with the University of Sussex £90 million capital investment, the new facility will provide the infrastructure to facilitate collaborations, partnerships and investments to drive innovation and commercialisation in life sciences. The facility will provide state-of-art laboratory space and equipment setting the stage for the University of Sussex to be recognised as a leading international centre for Life Sciences. The Sussex Bio-Innovation Centre will be part of the supported Sussex Innovation business incubator environment, providing specialist business and market expertise.

3. The Project

3.1 Developing the Life Science sector

There are many of the right ingredients for the Life Sciences sector to become established within the Coast to Capital LEP in the future, but it is starting from relative low ebb compared with the Oxford, Cambridge, London triangle. The main driver for this will come from effective collaboration between the universities and its local businesses. It will be centred on a clearly identifiable and well equipped 'hub' where academic researchers and commercial businesses can share knowledge and expertise and generate new product and services to take to market.

The investment in a new Life Sciences building at the University of Sussex will provide an exciting and highly interactive environment for world-class research across disciplines including Chemistry, Biochemistry and Biomedical Sciences, Genome Stability, Neuroscience, and Ecology.

It will include modern laboratories and full technical support services (including media prep, stores and workshop) and managed, state-of-the-art facilities for a broad range of specialist biotechnology activities, including:

- Synthetic and Medicinal Chemistry (including parallel synthesis);
- Analytical Chemistry (including 500 and 600 MHz NMR, small-molecule and powder X-ray crystallography and a full range of mass spectrometry);
- Structural Biology (including X-ray crystallography and cryo-electron microscopy);
- Protein Production (using bacterial, yeast, insect and human cells);
- Cell Biology (including cell line maintenance, cell sorting, and multiple cell-based assay screening platforms)
- Bio-Imaging (including fluorescence, confocal, two-photon, live-cell and super-resolution microscopy);
- DNA Sequencing;
- Proteomics (peptide fingerprinting, post-translational modification mapping);
- Bioinformatics (including virtual ligand screening, docking, homology modeling, genetic data analysis);
- Neuroscience (including electrophysiology with HT screening facilities and optogenetics).

The new facility will help the University continue to attract the best scientists, who can engage in vital research and development to support the sector.

The ambition is to develop a Sussex Bio-Innovation facility as part of the strategic growth and development of Life Sciences at the University of Sussex campus at Falmer, to the north of Brighton. The facility will become a focus of the University's leading Life Science and biomedical research and a growth base for bioscience entrepreneurs, and pharmaceutical companies. The focus will be on university life science research expertise: biochemistry and

molecular biology; chemistry; drug discovery platforms; genome damage and stability; and neuroscience.

3.2 Vision

To create a transforming innovation resource providing the infrastructure, support facilities and advanced technological expertise to help entrepreneurs and businesses translate innovations and investment in biotechnology and medical research into new products, processes and services utilising the university's life science research expertise.

3.3 Objectives

Stimulate and accelerate the growth and development of the life science sector in the south east, specifically bio-medical research, bioscience entrepreneurs and pharmaceutical companies

- Nurture university spin-outs companies and entrepreneurs to test and commercialise knowledge and ideas in the life science sector
- Foster collaboration and interaction between academics, businesses and clinicians (the 'ABC' relationship)
- Support the iterative testing and prototyping through access to knowledge, facilities and information

Position the University of Sussex as an anchor and centre of excellence for the development of the life science sector in the south east.

The Sussex Bio-Innovation centre will provide accommodation and access to high-end equipment, shared services, business support and access to investment for new and growing bioscience businesses. The building will provide high-quality laboratory accommodation available to rent by commercial research organizations.

Laboratory accommodation will be provided on a flexible / modular basis allied to the provision and access to University based equipment, processing facilities, expertise and personnel to meet the needs of different types of Life Sciences business, for example:

- University spin-off activity where the new companies need to move their projects off the academic research bench and into a more commercially focused laboratory environment but still maintaining access to the academic input and university facilities. Current example Sussex Multiple Myeloma Biomarker Assay – development of new diagnostic test.
- Early stage drug discovery companies that will wish to use the Bio-Incubator laboratory resources and capital equipment to focus their resources on the delivery of cutting edge research. These companies don't have the depth of resources to fund a full-scale laboratory set-up and need the lab space flexibility to grow as their research results attract additional funding. Lab work will be led by the company,

buying in the services and expertise from the University as required. *Current example Enterprise Therapeutics case study.*

- Small pharmaceutical / life science business that will wish to utilise the University's drug discovery platform to deliver a Contract Research Organisation (CRO) service for a specific commercial research programme. Here the University delivery as part of the Bio-Incubator service is more defined and fully integrated with the companies own personnel.
- Virtual pharma development companies that develop the intellectual property and outsource all the laboratory to specialist University laboratories. *Current example Destiny Pharma.*
- University – business research projects. Project based research studies jointly led by the University and a business partner.
- University Specialist Facilities – for example the proposed Pathology Sequencing and Genotyping facility.

The intention will be to develop a flexible modular laboratory design that will enable an evolving mix of companies. It is intended to provide laboratory and write-up space sufficient to support over 20 new life sciences business teams at one time. The commercial accommodation will be linked to the Life Science to provide a sense of coherence, identity and confidentiality for the commercial researchers.

Bio-incubator industry literature was reviewed, as well as user and market trends, during the business case process. The Sussex Bio-Innovation accommodation specification is based on examples of good practice throughout the UK and our operational experience of developing and managing the Sussex Innovation Centre. The facility needs to be designed to meet the needs of new and emerging businesses within the biomedical sector. Flexibility is necessary to provide modest sized spaces for new bio-medical clients but allow for internal; expansion and contraction as client business needs change during tenure in the incubator. The facility, proposed at 2,202m², would include a mix of lab, office and shared space.

3.4 Outputs (*number of jobs, number of businesses supported etc.*)

The Sussex Bio-Innovation Centre will service a substantial and growing commercial research activity in biotechnology and biomedicine, driven in part by the retreat of the multinational pharmaceutical industry from early stage research, and the many new academic and ex-pharmaspin-outs that are moving to occupy that space. Customers will include SMEs - developing proprietary therapeutic targets to proof-of-principle; devising and exploiting new screening methodologies for drug discovery; moving small molecules from 'hit' to 'lead' and into the clinic; developing new biomarkers for diagnosis and treatment; developing therapeutic proteins; developing novel therapeutic delivery systems; developing laboratory instrumentation etc.

Local Growth Funding will deliver:

- 2,202qm of dedicated specialist accommodation
- Support for 20 new life sciences business teams
- Over 60 specialist graduate-level jobs
- 630 academic and teaching jobs accommodated within the new Life Sciences building
- Annual Gross Value Added (GVA) impact of over £10m based on new jobs created

3.5 Key Strategic Benefits

Life Sciences and specifically the biomedical science sector continue to be a rapidly growing sector. Connecting the worlds of research science, clinical practice and the market is critical for innovation and growing the sector. The key strategic benefits of the Sussex Bio Incubator project are:

- Establish Greater Brighton and the Coast to Capital region as a major centre for health and life sciences;
- Contribute significantly to the strategic goal of strengthening local productivity and increasing the volume of higher value, knowledge based employment;
- Improve graduate retention;
- Enable the local and regional economies to attract life sciences talent from around the world;
- Facilitate inter-disciplinary approaches to innovation in the life sciences sector;
- Improve university-business collaboration by creating shared spaces and joint initiatives;
- Support innovation in the NHS through the BSUH Medical School
- Improve opportunities to commercialise academic knowledge and improve leadership and commercial skills within life sciences SMEs;
- Expand international trade;
- Raise the profile of the University of Sussex in the local and regional economies

3.6 Key Stakeholders and their roles and responsibilities

The project has been discussed with a number of key partners and stakeholders over the last 2 years; it's inclusion as a priority economic growth intervention by the Coast to Capital LEP and as a key 'pipeline' project by the Greater Brighton Partnership Board demonstrates the broad support to the project. It is recognised as being a core element in supporting the growth and development of the life sciences sector in the region.

Letters of support have been received from a range of partners, including:

- Coastal West Sussex Partnership
- Gatwick Diamond
- Brighton and Hove Economic Partnership

The Sussex Innovation Centre has a track record of growing innovative businesses; 85% of members have become sustainable businesses with the support services and affordable serviced office space offered by the centre. 1 in 6 of these businesses have grown to achieve turnover of £1m+. However, the lack of specialist laboratory space is impacting the growth aspirations of entrepreneurs and fledgling biotech and medtech companies. Discussions with these enterprises and other Life Sciences businesses in the region has identified a need for such a facility, specifically access to the expertise, networks and scientific facilities provided by the University.

"SINC has been a good starting point on our journey but we now need something that is geared up to support our aggressive development and growth strategy within a cost effective, fully equipped, well-connected, life science innovation facility with easy access to London Gatwick. Over the coming year we will be looking for the right facility to meet our needs and hope that the we could be an anchor tenant in the proposed new life sciences building."

Robin Stephens, Director, PsephosBiomedica

"As a leading UK clinical stage biopharmaceutical company, based at Sussex Innovation Centre for a number of years, Destiny Pharma recognises the value of high quality laboratory facilities and staff to augment its research and development capabilities. This is a model that the company has a great deal of experience of and understand the importance of developing relationships with a range of laboratory contractors. SMEs and larger healthcare companies have seen a growing demand for contract laboratories as they often don't maintain these services internally. Sussex is also a good location for these type of services with a large potential customer base in the south east, however a quality laboratory facility would undoubtedly attract customers from further afield and internationally".

Dr Bill Love, Destiny Pharma Ltd

3.7 Strategic Options for Delivery

The options analysis identified a number of options for delivering the project, which are reviewed in section 4

3.8 Risks of Strategic Options

A project of this size, scale and ambition has a number of strategic issues and risks to be managed. These include:

- Failure to secure adequate capital funding;
- Difficult in recruiting and selecting fledgling biomedical enterprises and/or spin out companies from the university;
- Failure to identify and secure tenant companies;
- Failure to secure cross-sector collaboration between academics, businesses and clinicians.

Most of these risks and issues have been mitigated through forward planning and stakeholder engagement.

3.9 Long term sustainability

External capital funding is essential to the success of the project as it provide the investment necessary to provide a state-of-the-art bio-incubator space, facilities and equipment for growing the life science businesses emerging from the research base. The facilities and expertise available within the Bio-Innovation Centre will be crucial in achieving the conversion of intellectual property derived from the research and clinical base into commercial opportunities.

The University is currently preparing a Business Plan for the Life Sciences campus, including a detailed assessment of the Bio-Innovation Centre component.

4. Options Appraisal

4.1 Long List

The Project Board, including representatives from the Life Science School, University of Sussex Finance Department, the University's property advisors and the Managing Director of Sussex Innovation Centre, has undertaken an appraisal of the potential options for delivering against the Sussex Bio-Innovation vision and objectives. A number of options ranging from 'do-nothing' through to the comprehensive development of a new Bio-Innovation facility were considered as part of this option appraisal exercise. The initial appraisal focused on assessing two criteria:-

- Does the option meet the vision and objectives?
- Is the option deliverable?

The following options were identified for further analysis.

Options	Summary Results of analysis
Bespoke Bio-incubator within Greater Brighton	Not shortlisted - limited available sites; - cost of development; - lack of development partner
Extension to Sussex Innovation Centre	Not shortlisted - limited expansion space
Extension and inclusion within the Life Science building on University campus	Shortlisted option
Refurbishment of existing building within the University's estate	Not shortlisted - limited site availability within Falmer campus
Rental of specialist laboratory space in Greater Brighton	Not shortlisted - no specialist laboratory space available for rent
Do-nothing option	Least favoured option

4.2 Short listed options

The analysis and assessment, including a review of good practice throughout the UK and the operational experience of developing and managing the Sussex Innovation Centre, confirmed the importance of co-location within a university – research environment. By embedding a bio-innovation facility within a multidisciplinary academic biomedical and biological research and teaching building, the University can offer a unique environment in which small start-ups and specialist satellite labs of larger companies, can directly access a broad range of support services, technical facilities and research expertise. Enterprises will have direct access to laboratory staff and to a broad range of state-of-the-art managed facilities and services of direct relevance to biotech research, which would otherwise need to be found from external bodies. Companies will readily be able to access expertise and consultancy from the cadre of world-class academic researchers working in the building, while their laboratory workers will be able to keep their skills at the state-of-the-art through interaction with peers working in the academic research groups. The presence of a large population of academic researchers and research students provides a superb pool of local scientists from which companies can rapidly recruit as their activities grow.

A short list of development options on the Falmer campus were generated by the design team. Following an options appraisal process (information available on request), the new Life Sciences building will be located within the academic area of the masterplan, as proposed by ADP. This building will be the first to be constructed in this area following on from the outline success of the masterplan application, and it will act as a landmark academic building to connect the new academic area to the wider campus. The new Life Sciences Building will be linked to the existing Genome Building to the west. The site is currently used as a car park. The new building will face onto one of the main pedestrian axis routes on campus running west down to Falmer House and Library Square.

5. Delivery

5.1 Project management arrangements

The University of Sussex has considerable experience in managing construction projects within time and on budget. The University will deliver the project on its Falmer Campus as part of its Life Sciences Building development. JLL have been appointed Project Managers to oversee the full development and commissioning of this project. A detailed Services Specification has been agreed between the University and the Project Manager (JLL) which sets out the scope of service to ensure effective delivery of the project.

JLL is an international full services property management and consultancy company. They have a clear publicly available track record as a market leader in property services, of which project management is particularly relevant in this project. JLL has a well-developed, long-established and highly reputed Higher Education sector group which is among the market leaders in the UK and worldwide.

5.2 Procurement Strategy

The University of Sussex is a public sector organisation for the purposes of EU public procurement legislation. As a charity and as a Higher Education institution overseen by the Higher Education Funding Council for England, the University has a responsibility to demonstrate value for money in all its operations including procurement. The University takes this responsibility extremely seriously by embedding value for money within its Financial Regulations, by providing professionally qualified support for procurement managed by the Director of Finance, who is member of the executive team of the University, and by reporting annually to Council, the Governing Body, how the University has delivered value for money through its activities including major projects. Large scale supplier appointments are generally managed either direct to the market through an EU public procurement or by accessing available frameworks where these permit appointment of suitable suppliers at appropriate value for money rates and terms and conditions which are open to us through existing compliant EU publicly procured contracts frameworks operated by other public sector organisations. This blended approach is used as appropriate to any specific project, to deliver the best mix of administrative cost and resource and timing, with value for money and the best suppliers for the task at hand.

The University procurement strategy is designed to deliver value for money by means of economy, efficiency and effectiveness in all campus procurement provision. Delivery of the procurement strategy is driven by the University Financial Regulations, procurement process development, coordinating and leading project teams, value for money reviews and initiatives, effective procurement planning and contract implementation.

The design and delivery of the project fully complies with the current procurement strategy and objectives for the University.

5.3 Implementation Timescales

As the building itself is a specialist and large project, the University is engaged in an EU tender project to appoint the main construction contractor in a single stage restricted process tender. This is expected to result in appointment of the Preferred Supplier in Autumn 2016 to take the project forward from the design reached at that stage to complete the Design and Build of the project. At that stage it is likely that many of the design consultants will be novated to the main contractor, with the University retaining some reporting responsibilities from the consultant team and that the University will retain direct appointments of the key oversight consultants such as Project Management and Cost Consultancy, Depending on the specific structures in place as a result of the construction contract tender it is also likely that the University will appoint its own consultant team to monitor quality assurance of the build.

The Sussex Bio-Innovation Centre will partly be accommodated within the refurbished Genome Building, which will include direct access into the main Life Science building. The space is currently occupied and cannot be vacated until the new building is progressed. The anticipated timetable for the Sussex Bio-Innovation Centre is:

- Bio-Innovation Centre works commence: April 2017
- Work complete: June 2019
- Client fit-out: July 2019
- Bio-Innovation Centre operational: December 2019

The project so far has been working in conjunction with the anticipated conclusion to the University's Masterplan Outline planning permission appeal. The Masterplan has now successfully been appealed and matters relating to the Life Sciences application can now progress. The University has appointed an estate Planning Consultant to provide consistency in approach with the Planning Authority. JLL will maintain regular communication with the University and Planning Consultant in order to progress the application. The target date for submitting the Planning Application is during this financial year (2015/16).

6. Financial Case

6.1 Budget Profile

The total cost of the Life Science campus project is £90,000,000. The Local Growth Fund application is £9,120,000, which equates to 10% of the total project cost.

The funding profile is outline in the table below.

	2017/18	2018/19	2019/20	Total	Is the match confirmed?
Total Project Expenditure					
Local Growth Funding	£3,040,000	£3,040,000	£3,040,000	£9,120,000	
Private sector match					
University of Sussex	£30,000,000	£30,000,000	30,000,000	£90,000,000	Confirmed
				£99,120,000	

The University is making a significant capital commitment towards developing an infrastructure to support the strategic growth and development of Life Sciences. The Local Growth Funding investment is required to provide the physical business interface in the form of the Sussex Bio-Innovation Centre, which cannot be funded within the current capital investment programme. The development of independent, high specification laboratory workspace for early stage / small bioscience businesses is prohibitively expensive for the University and indeed for individuals businesses and business park developers. Experience shows that these facilities are rarely built on a straight commercial basis.

Without Local Growth investment, the physical interface and specialist accommodation provided through the Sussex Bio-Innovation Centre would not go ahead. This would have a major impact on the strategic growth and development of the Life Sciences sector in the region and on the ability to provide a dedicated growth incubator space for bioscience entrepreneurs and pharmaceutical companies. The University of Sussex, specifically through the activities and operations of the Sussex Innovation Centre, would continue to support and nurture knowledge-intensive companies in the Life Sciences sector. However, the opportunity to develop high specification laboratory space for early stage / small bioscience enterprises together with connecting enterprises to a new University Research facility and access to high value scientific equipment and academic expertise would be lost.

7. Management Arrangements

The university has considerable experience in managing significant investment programmes involving construction projects within budget and to time.

7.1 Procurement of the professional team

The University has used public frameworks to appoint JLL as Project and Cost Management consultants to the University. Other supporting consultants are being appointed direct by the University and the Architects under best value, compliant processes. The design team were analysed and scored on price and quality (ITT Evaluation Score Sheet) to ensure the recommended company demonstrated the following:

- Propose a team which had an extensive track record of similar schemes in higher education and life sciences.
- Provide the appropriate level of resource required to deliver the scheme to the expectations of the University of Sussex.
- Provided competitive rates which were in line with the market.

Through the procurement of the design team, professional fees equate to 12.6% of the construction value which is in line within the typical range of 10-15%. Through this procurement process, the following primary consultants have been appointed by the University:

- Architect - Hawkins Brown
- Structural Engineer – Curtins
- Services Engineer – Elementa Consulting

7.2 Project Governance

The Project Board, including representatives from the Life Science School, University of Sussex Finance Department, the University's property advisors and the Managing Director of Sussex Innovation Centre, is responsible for the design and delivery of the project.

7.3 Communications and Stakeholder Management

The Life Science building project, specifically the Sussex Bio-Innovation Centre component, will continue to be discussed with partners and stakeholders over the coming months to ensure that they remain fully briefed as the project develops and the university is able to generate further input, intelligence and information to assist shape the design, development and operation of the facility.

7.4 Project Reporting

The University will continue to operate effective and efficient Project and Programme Management reporting arrangements to ensure successful delivery including:

1. Delivery of the project in accordance with the university's Risk Management Policy;
2. Continuation of University Project Management Board to oversee construction of the building and associated works;
3. Continuation of detailed contract management specifically to provide Project Management support;
4. Establishment of a number of 'User Groups' to inform the design development and refine the operational brief;
5. Establishment of Life Sciences Enterprise Steering Group, overseen by the Managing Director of the Sussex Innovation Centre to assist support operational and marketing arrangements for the Sussex Bio-Innovation Centre;
6. Delivery of the Communications and Engagement Plan during the first quarter of 2016 to ensure stakeholders are fully briefed on the development and implementation of the project.

7.5 Risk Management

The Project Board has developed a Risk Register, which will be regularly reviewed and updated.

7.6 Project Evaluation

Key Performance Indicators will be established to monitor the performance of the Sussex Bio-Innovation Centre and the wider economic developments.

During construction, all industry standard tools will be deployed in managing consultants and interfacing with client functions including the University Project Board chaired by Pro-Vice Chancellor Professor Michael Davies. These include Project Trackers and Milestone measurement, Project Plan and critical path analysis, regular progress meetings and reporting to project team and project board on cost, programme, dependencies and risk.

Overall progress of the development, costs and achievements of KPIs will be reviewed on a regular basis by the Project Board.

Following completion of the development, an independent evaluation of the programme will be commissioned and reported to the Coast to Capital Board and key stakeholders.