CABINET – 3 February 2015 EXECUTIVE SUMMARY OF AGENDA ITEM 7

Report title: BRISTOL IS OPEN - THE OPEN PROGRAMMABLE CITY
Wards affected: CITYWIDE
Strategic Director: NICOLA YATES, CITY DIRECTOR
Report Author: STEPHEN HILTON, FUTURES DIRECTOR

RECOMMENDATION for the Mayor's approval:

1. Note the work undertaken by BCC over the last 2 years to deliver the DCMS Super Connected Cities programme in Bristol.

2. Approve the formation of Bristol is Open (BIO), a joint venture company between BCC and UoB to take forward the Open Programmable City project.

3. Approve BCC entering into:
   
a) a shareholders agreement with UoB to regulate how the joint venture (BIO) will operate

   b) a resource agreement with UoB detailing how the infrastructure purchased using the DCMS grant for Super connected Cities programme and infrastructure already owned by BCC can be used by BIO, and other resources that BCC will make available to BIO

4. Ratify the urgent decision, taken under delegated powers, to provide one-off funding of £1m received from DCMS to @Bristol to retrofit the planetarium as a state-of-the-art city data visualisation dome and approve BCC entering into a grant agreement with @Bristol in relation to this.

5. To accept (subject to the business case being signed off) up to £15m funding from the West of England Local Enterprise Partnership to Bristol City Council to extend the BIO infrastructure to key locations within the west of England area.

Key background / detail:

a. Purpose of report: Insert text

To update on progress of the Gigabit Bristol Project, this is using funding secured by Bristol City Council (BCC) from the Department of Culture, Media and Sport (DCMS), for the Super Connected Cities programme. To seek approval for the formation of Bristol is Open (BIO) - a joint venture company to be established by Bristol City Council and the University of Bristol (UoB). BCC has used £5.3m funding secured from DCMS to purchase digital infrastructure. The infrastructure will be licensed to BIO, which will exploit ducts, street furniture, software and high performance computing assets already owned by BCC and UoB to progress the Open Programmable City project. Also to ratify the urgent decision taken in December 2014 to grant fund @Bristol to retrofit the planetarium in support of the BIO initiative and to accept, subject to final business case approval, up to £15m funding from the West of England Local Enterprise Partnership to extend the BIO infrastructure.
b. Key details:

1. BIO is a major innovation project within the Government’s Super Connected SCC programme and £5.3m has been allocated to Bristol City Council for the project’s delivery.

2. BIO will be the vehicle for an experimental broadband, wireless and high performance computing infrastructure that will stimulate and study the convergence in cities of different telecommunication, software, hardware, data and sensing technologies. We call this the Open Programmable City.

3. BCC and UoB intend to form a company which will be called Bristol Is Open. BCC and UoB will both own shares in the company, and have 50/50 control at shareholder level. We will enter into a shareholders’ agreement that will detail how BIO is governed by BCC and UoB.

4. BIO will oversee the BIO research infrastructure and form commercial partnerships with large technology companies and SME’s and research organisations. A 3 year business plan for BIO has been prepared.

5. The BIO infrastructure consists of fibre ring linking the UoB high performance computer to a number of central nodes (@Bristol, Watershed and Engine Shed) and a wide area wireless mesh network. Now, using the SCC grant, the fibre in these ducts has been upgraded for use by the BIO Open Programmable City test-bed. The planetarium at @Bristol is being upgraded as part of the SCC project, turning it from an analogue to a digital projection environment, capable of visualising many different types of content from Met Office weather patterns, to 3D product design, to interactive games.

6. BCC and UoB will also enter into a resource agreement under which the infrastructure purchased using the DCMS grant and infrastructure already owned by BCC will be licenced to BIO. The resource agreement will also set out any other resources which BCC will provide to BIO, including resources secured externally from Innovate UK for the delivery of Future City Demonstration projects or other grant funding from successful bids.

7. At Board level, BCC will be entitled to nominate 2 Directors (currently intended to be Nicola Yates and Stephen Hilton) and UoB will be able to nominate 2 Directors (currently intended to be the PVC for Research and the university Finance Director). The Chair is yet to be determined and may be shared between the two organisations.

8. A bid to extend the BIO infrastructure was included as part of the WoE LEP’s Strategic Economic Plan. This bid was successful, securing a £15m funding allocation - funding will be confirmed on approval by the LEP’s Investment Board and Government of a full Business Case.
AGENDA ITEM 7

BRISTOL CITY COUNCIL
CABINET
3 February 2015

REPORT TITLE: BRISTOL IS OPEN - THE OPEN PROGRAMMABLE CITY

Ward(s) affected: City Wide

Strategic Director: Nicola Yates, City Director

Report author: Stephen Hilton, Service Director of Bristol Futures

Contact telephone no. 0117 922 3293

Contact email: stephen.hilton@bristol.gov.uk

Purpose of the report:

To update on progress of the Gigabit Bristol Project, this is using funding secured by Bristol City Council (BCC) from the Department of Culture, Media and Sport (DCMS), for the Super Connected Cities programme. To seek approval for the formation of Bristol is Open (BIO) - a joint venture company to be established by Bristol City Council and the University of Bristol (UoB). BCC has used £5.3m funding secured from DCMS to purchase digital infrastructure. The infrastructure will be licensed to BIO, which will exploit ducts, street furniture, software and high performance computing assets already owned by BCC and UoB to progress the Open Programmable City project. Also to ratify the urgent decision taken in December 2014 to grant fund @Bristol to retrofit the planetarium in support of the BIO initiative and to accept, subject to final business case approval, up to £15m funding from the West of England Local Enterprise Partnership to extend the BIO infrastructure.

RECOMMENDATION for the Mayor's approval:

1. Note the work undertaken by BCC over the last 2 years to deliver the DCMS Super Connected Cities programme in Bristol.

2. Approve the formation of Bristol is Open (BIO), a joint venture company between BCC and UoB to take forward the Open Programmable City project.

3. Approve BCC entering into:-

   a) a shareholders agreement with UoB to regulate how the joint venture (BIO) will operate

   b) a resource agreement with UoB detailing how the infrastructure purchased using the DCMS grant for Super Connected Cities programme and infrastructure already owned by BCC can be used by BIO, and other resources that BCC will make available to BIO. The resource agreement will also detail how resources made available by UoB can be used by BIO.
4. Ratify the urgent decision, taken under delegated powers, to provide one-off 
  funding of £1m received from DCMS to @Bristol to retrofit the planetarium as a 
  state-of-the-art city data visualisation dome and approve BCC entering into a grant 
  agreement with @Bristol in relation to this.

5. To accept (subject to the business case being signed off) up to £15m funding from 
  the West of England Local Enterprise Partnership to Bristol City Council to extend 
  the BIO infrastructure to key locations within the West of England area. This award 
  is made via the Local Growth Fund to deliver the ‘Terabit West’ project, which was 
  included in the Strategic Economic Plan for the West of England.

The Proposal:

Bristol is Open

1. BIO is a major innovation project within the Government’s Super Connected SCC 
   programme. It is welcomed by central Government as a particularly innovative project 
   within the national SCC programme and £5.3m has been allocated to Bristol City 
   Council for the project’s delivery. It is in line with the original Ministerial ambition for 
   the SCC programme to enable ‘Singaporean levels of connectivity’ in UK cities.

2. BIO will be the vehicle for an experimental broadband, wireless and high performance 
   computing infrastructure that will stimulate and study the convergence in cities of 
   different telecommunication, software, hardware, data and sensing technologies. We 
   call this the Open Programmable City. Through a focus on big trends such as Smart 
   Cities, Software Defined Networks (SDN), the Internet of Things (IoT) and Big Data, 
   the aim is to facilitate the exploration of innovative ways to address urban challenges, 
   such as mobility, energy efficiency and meeting the care needs of an ageing 
   population. BIO will also enable new technologies for media broadcast, entertainment, 
   culture and the visitor economy and will bring benefits for the development of 
   autonomous systems, robotics and advanced manufacturing, including supporting 
   Bristol’s recent successful bid for driverless vehicles.

3. Importantly, the local community in Bristol is central to the opportunity that the Open 
   Programmable City provides. The project takes a human-centric approach to so called 
   Smart Cities, which is attracting significant interest from the national media, including 
   the Financial Times, Sunday Times and the Observer, as well as from Government 
   and Industry. This is enhancing Bristol’s reputation as a ‘Laboratory for Change’, 
   where technology and data create a liveable city and have a positive impact on quality 
   of life.

4. The project addresses issues of data security and privacy, utilising University of Bristol 
   expertise. A citizens’ charter for data will also be explored by Knowle West Media 
   Centre in support of the project.

5. BIO will oversee the research infrastructure and form commercial partnerships with 
   large technology companies and SME’s and research organisations. A 3 year 
   business plan for BIO has been prepared. BIO has been approved by DCMS as part 
   of its stringent quality assurance gateway process and is being monitored by DCMS 
   through direct representation in the Bristol SCC Project Board.

Scope of the BIO Infrastructure
6. The BIO infrastructure consists of fibre ring linking the UoB high performance computer to a number of central nodes (@Bristol, Watershed and Engine Shed) and a wide area wireless mesh network. This is possible because more than a decade ago, Bristol City Council bought a network of redundant ducts from a cable TV company. Subsequently, the ducts were refurbished and used to network Council buildings and deploy BNet. The duct network has been extended over the years to reflect the city’s changing business footprint. This includes the development of a new general purpose duct to support business growth in Bristol Temple Quarter Enterprise Zone.

7. Now, using the SCC grant, the fibre in these ducts has been upgraded to 144 core fibres for use by the BIO Open Programmable City test-bed. From April 2015 this active fibre network will enable a mile of programmable Wi-Fi connectivity along the Brunel Mile and a Radio Frequency (RF) Mesh network across the city, comprised of approx. 50 clusters of lamp-posts to host the mesh, which will in time support a wide range of sensor and communications devices.

8. The planetarium at @Bristol is being upgraded as part of the SCC project, turning it from an analogue to a digital projection environment, capable of visualising many different types of content from Met Office weather patterns, to 3D product design, to interactive games. It will be connected to the network, and therefore the UoB High Performance Computer, and will open up many new possibilities. Eight companies have signalled their potential use of the Dome and UoB’s Computer Science Department is helping with technical specifications. DCMS’s quality assurance board approved funding for this element of the programme at a very late stage, resulting in the need for an urgent decision to give a grant of £1m to @Bristol to be taken by the City Director under delegated powers. An order for the equipment has now been placed by @Bristol and this report seeks to formally ratify the grant funding decision.

9. At UoB, the BIO Software Defined Network will be hosted in the high performance networks lab. When combined with the IoT Bay platform (or other Internet of Things platforms), the ability to collect data from sensors in its environment will create ‘Big Data’. A network emulator will be ready during 2015, allowing a wide variety of experiments with different network traffic. In turn applications that can analyse and programme this data will emerge through collaborative partnerships. Two research partnerships of telecommunication companies have already formed, hoping to use the test-bed infrastructure.

10. A network diagram of the BIO infrastructure is included at Appendix 1.

BIO Company Structure

11. Bristol City Council and the University of Bristol agreed ‘heads of terms’ for the formation of a joint venture in August 2014. This was a requirement of the DCMS quality assurance checkpoint process through which the grant funding to Bristol was approved. Since then BCC has been using Bevan Brittan LLP (solicitors) to advise on the company structure of BIO and documentation required.

12. BCC and UoB intend to form a company which will be called Bristol Is Open. BCC and UoB will both own shares in the company, and have 50/50 control at shareholder level. We will enter into a shareholders’ agreement that will detail how BIO is governed by BCC and UoB.
13. At Board level, BCC will be entitled to nominate 2 Directors (currently intended to be Nicola Yates and Stephen Hilton) and UoB will be able to nominate 2 Directors (currently intended to be the PVC for Research and the University Finance Director). The Chair is yet to be determined and may be shared between the two organisations.

14. BCC and UoB will also enter into a resource agreement under which the infrastructure purchased using the DCMS grant and infrastructure already owned by BCC will be licenced to BIO for research purposes. The resource agreement will also set out any other resources which BCC will provide to BIO, including resources secured externally from Innovate UK for the delivery of Future City Demonstration projects or other grant funding from successful bids. BIO’s Board will decide on the staff needed by BIO and how these will be recruited. BIO’s staff will be paid for by BIO’s revenue.

15. UoB is following its own internal processes to authorise the creation of this joint venture company with BCC. This process is well advanced. Once complete, Bristol Is Open Limited will be incorporated by Companies House and will open a business bank account.

Extending the BIO Infrastructure to the WoE

16. A bid to extend the BIO infrastructure was included as part of the WoE LEP’s Strategic Economic Plan (the project referred to as Terabit West). This bid was successful, securing a £15m funding allocation - the largest single allocation to any growth project nationally. The funding will be confirmed on approval by the LEP’s Investment Board and development of a full Business Case. This is expected by June 2015 and the extension will then be delivered during the following 3 years. The extension will allow locations such as the University of the West of England, the Bristol Robotics Lab, Bath University, the Science Park, Knowle West Media Centre and the Bottle Yard and Enterprise Areas to be connected to the research infrastructure as business cases are identified.

Consultation and Scrutiny Input:

17. Consultation on the BIO programme has taken place with Government and internal and external partners and with industry via specific one-off meetings and requests for input, regular meetings of the SCC Programme Board and wider market engagement days held as part of the procurement process. Membership of the SCC Project Board is:

- Stephen Hilton, BCC (SRO)
- Dick Penny, Watershed
- Carolyn Hassan, Knowle West Media Centre
- Prof. David May, UoB
- Prof Nishan Canagarajah, UoB
- Prof Joe McGeehan, WoE LEP
- Gavin Beckett, BCC
- Iain Turner, DCMS

a. Internal Consultation:

- SLT
- Extended Leadership Team (all Service Directors)
• BCC ICT & Information Architecture
• Highways and Transport
• Legal
• Finance
• Property
• HR
• The Deputy Mayor and relevant Assistant Mayor and Business Change Scrutiny Chair were consulted specifically about the urgent decision to grant fund @Bristol

b. External Consultation:

• Industry representatives including, Toshiba, BBC, BT, NEC, HP, IBM, BAE Systems, HyperCat, Atkins, Aardman, GEC, NVidia
• Delivery partners including, @Bristol, SETSquared, Knowle West Media Centre, Watershed, WoE LEP
• Academic partners including, UoB, UWE and Bath University
• Government stakeholders including, DCMS, BIS, UKTI, Future City Catapult and Innovate UK and the European Commission.
• Legal – Bevan Brittan

Other Options Considered:

18. Outside of the SCC Broadband Voucher Scheme, DCMS investment cannot be readily used to provide conventional broadband access. A wide spread initiative to give businesses access to ‘Gigabit’ connectivity was included in the original SCC bid but this was subsequently rejected due to the likelihood of State Aid challenge by the Telecoms industry. Instead, BIO has been carefully re-positioned as a research initiative for pre-commercial technologies so as not to attract State Aid.

Risk Management / Assessment:

19. The current BIO risk register is set out below. As this is a joint venture, the ownership and mitigation of risks is a responsibility for both BCC and UoB.

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>Owner</th>
<th>Risk Category</th>
<th>Timing 1 on-time 5 delayed</th>
<th>Risk 1 low 5 high</th>
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<td>Procurement</td>
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<td>Fraud, Supply Chain, Financial, Reputation</td>
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<td>Deployment of the Network</td>
<td>R Delaney</td>
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<td>03</td>
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<td>Legal &amp; Project</td>
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20. This is a summary of the actions being taken to mitigate the risks.

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<th>Description</th>
<th>Owner</th>
<th>Risk Category</th>
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<td>01</td>
<td>Procurement</td>
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<td>Specialist technical advice, active involvement of procurement team, adherence to due process</td>
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<td>Agreed Business Plan</td>
<td>P Wilson S Hilton, N Canagarajah (UoB)</td>
<td>Project, Financial</td>
<td>One to one and formal discussion has progressed</td>
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<td>Communication about the project</td>
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<td>Reputation</td>
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<td>Data Dome Deployment</td>
<td>J Dignan</td>
<td>Project &amp; Reputation</td>
<td>Active participation of all parties with strong technical advice</td>
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<td>Presentation to corporations, discussions evolving</td>
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<td>Technical, Financial, Project, Reputation</td>
<td>Easy on boarding and customer management is required. This needs six months development work.</td>
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</table>
Public sector Equality Duties:

21. BIO is an infrastructure project, however, as it starts to be used to support experiments that develop new solutions to urban challenges it will be important to ensure that equality impact assessments are undertaken to evaluate impact of projects on all sections of the community. As a company, BIO will ensure equality and inclusion in its recruitment and employment practices.

Eco Impact Assessment

22. The significant impacts of this proposal are;

- The short-term environmental impacts may include the increased consumption of fossil fuels, raw materials, production of waste & impact on local wildlife habitats & biodiversity during the deployment of digital infrastructure across the city. Additionally, there will be some local disruption & changes to the appearance of the city during installation, deployment & maintenance of such infrastructure.

23. The longer term impacts will include;

- Vulnerability to the effects of climate change & flooding
- The ongoing consumption of energy for use of existing & future digital technologies
- Potential visual changes to the appearance of the city
- Reduced consumption of non-renewable energy in the coming decade through improved digital communications, high quality ultrafast broadband & efficient working practices and the reduced need to travel

24. The environmental impacts raised above will be addressed through a number of mitigating measures. These include;

- Innovative technologies & smart joint working practices with other utilities will minimise disruption during the installation process.
- Wireless access points will be incorporated sympathetically into existing street furniture to mitigate changes to the appearance of the city.
- The design, specification & procurement of the scheme will address the use of natural resources, energy use during installation, vulnerability to climate change & flooding & waste reduction and re-use. Waste arising from works undertaken will be managed sustainably and legally.
- All other impacts will be resolved through consultation with the relevant statutory bodies & stakeholders.
25. The net effects of the proposals are;

- Providing the above mitigation measures are successfully implemented, BIO will enable Bristol to become a creative, smart, green & connected city & will help to reduce emissions in the coming decade through improved digital communications, efficient working practices and the reduced need to travel.

Resource and Legal Implications:

Finance

A. Financial (Revenue) Implications:

26. Revenue funding for BIO is available from 3 sources, funding and grants already secured; new funding bids and new commercial arrangements with companies wishing to collaborate or experiment on the BIO infrastructure. A summary of current and expected revenue is set out below:

Existing Revenue:

- £300K BCC funding supporting project delivery of the SCC programme including BIO development
- £3m Future City Demonstrator ‘runner’s-up prize’ (existing revenue funding from Innovate UK held by Bristol Futures)
- In-kind revenue contributions from UoB (project staff)

UoB Research Bids:

- £600,000 to BIO from DCOPLER research, subject to the bid’s success
- £250,000 to BIO from SLAVS research, subject to the bid’s success

Commercial Funding:

- The innovative and pre-launch nature of the BIO project means it is hard to accurately forecast commercial income. Following engagement with potential commercial partners realistic income targets have been set as part of the 3 year business plan.

Revenue Forecast

27. The initial BIO business plan looks at a 3 year horizon for the revenue budget. The revenue budget is established on the basis of direct costs of staffing and other direct costs and income generated from clients and partners.

28. The business plan is presented on this basis without taking account of the revenue funds and grants that have already been secured by the Council and University. This focus means that a clear view of business success can be reported to the Board within its monthly reporting cycle. However, the whole enterprise offers a lower risk to the Partners given the levels of revenue reserves held over the operating period.
29. The business plan sets out the 3 year revenue budget. The current expectation is that a small operating loss is likely to be registered in 2015 as costs run ahead of securing partners willing to pay for access to the offered facilities. This is forecast to change to a surplus of £1.42m in 2016 with further improvement beyond that. Surpluses will be required in order to re-invest in the network infrastructure and associated technologies in order to ensure that BIO continues to offer a state-of-the-art research facility. The budget is modelled on customer on-boarding activities as set out in detail in the business plan. The projected annual cash position of the company is set out in the graph below.

![Graph showing projected income and expenditure with increasing trend from 2015 to 2017.]

30. Key to maintaining financial control will be the monitoring of the operational budget by the founding partners, BCC and UoB. This monitoring process will also facilitate decision making over how any trading surpluses are used. Provision for this is established in the Joint Shareholders agreement.

Advice given by Mike Allen, Finance Business Partner
Date 20th Jan, 2015

b. Financial (Capital) Implications:

31. Capital funding to build the Bristol is Open infrastructure is £5.3m (inclusive of £1m to @Bristol to retrofit the planetarium). This is funded from the £11.3m DCMS Super Connected Cities funding that has to be spent by April 2015 and is noted within BCC Capital Programme for 2014/15.
32. Additional capital has been allocated via the West of England Local Enterprise Partnerships Strategic Economic Plan to extend Bristol is Open into the WoE. This funding, which is c. £15m will be available from June 2015 to March 2018 and the funding is subject to a separate business case and sign-off process involving the LEP Investment Board and Government. Once fully agreed, this capital will be added to the BCC Capital Programme as appropriate.

Advice given by    Jon Clayton, Principal Accountant  
Date                19th January 2015

Comments from the Corporate Capital Programme Board:

33. See above advice

c. Legal implications:

State Aid

34. Whenever the Council’s resources (including any grants received from central government) are used to provide services and/or infrastructure, there is a risk of State Aid. (State Aid is illegal unless certain conditions are met, in which case the aid will be ‘compatible’).

35. Bristol City Council’s legal team has investigated the possibility that the DCMS grant could constitute State Aid and has reached the conclusion there is a low risk of the majority of the grant constituting State aid. For a small part of the grant (the £1m to be given to @Bristol to retrofit the planetarium as a state-of-the-art data visualisation dome) there is a low to medium risk that this will constitute State Aid.

36. The establishment of Bristol is Open should not generate any new State Aid concerns.

37. The position with regard to State Aid and the grant from the LEP has not yet been investigated, but will form part of the business case to be submitted.

Procurement

38. Whenever BCC procures goods, works or services over certain thresholds, it must comply with the Public Contracts Regulations (the Regulations) including procuring a party to provide joint venture services. The Regulations oblige BCC to carry out a public tender process unless an exemption is available. A public tender process has not been carried out in this instance as it could be argued that the procurement of a joint venture partner is exempt from the Regulations due to the UoB having an exclusive right to the high performance computer and other digital equipment and skills and knowledge which is necessary for the provision of the joint venture services (regulation 6 (I)(ii)).

Advice given by    Sinead Willis / Solicitor and Team Leader (Acting)  
Date                20 January 2015

d. Land / property implications:
39. Third party locations such as Watershed, Engine Shed and @Bristol are hosting equipment that is necessary to operate the BIO infrastructure. The arrangements for hosting and allowing access to this equipment are set out in Partner Agreements, which form a legal basis for the collaboration. The quality of the infrastructure will contribute to Bristol’s attractiveness as a business location and thus the strength of its property market.

Advice given by  Robert Orrett, Property Director  
Date  21st January, 2015

e. Human resource implications:

Guidance:

40. The staff team working on the start up phase of BIO consists of,

- Paul Wilson, MD (Interim)
- Dimitra Simeonidou, CTO (P/T) UoB
- Helen Bream, Senior Programme Manager
- Ruth Delaney, Project Manager
- Joe Dignan, Project Manager
- 1 x P/T Procurement Officer
- 2 x F/T Technicians
- Approx. 2 x F/T Academic technical leads (drawn from a wider UoB pool)

41. As the company is launched UoB and BCC will recruit a permanent MD and a small staff team. The costs of this are included in the 3 year business plan. As roles are defined within the JV it will, although unlikely, be possible to identify whether any transfer of undertakings issues exist for BCC or UoB staff. More likely is a situation where secondment opportunities will be created that can be made available to those currently engaged in the startup phase of BIO. As we move towards establishing these arrangements, it will be important to ensure that appropriate contractual agreements are in place with the staff involved, and HR and Legal advice will be sought at this time.

Advice given by  Alex Holly, People Business Partner  
Date  16th January, 2015

Appendices:

Appendix 1 – Network Diagram of the BIO Infrastructure

Access to information (background papers):

REPORT TITLE:  Ultrafast Broadband (Gigabit Bristol)  
BRISTOL CITY COUNCIL, CABINET, 27th September 2012

https://www.bristol.gov.uk/committee/2012/ua/ua000/0927_6.pdf
Appendix 1 – Network Diagram of the BIO Infrastructure