

CASE STUDY

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NEWCASTLE UNIVERSITY AT SCIENCE CENTRAL

A 'living laboratory' for
sustainability in the city centre

Summary



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1. Science Central site, viewed from the northeast, September 2014
 2. Science Central, artistic impression of projected development at outline masterplan stage, from southwest, including Urban Sciences building (coloured brown, centre ground)
 3. Urban Sciences building, as seen from across Science Square: artistic impression.
- Images courtesy Hawkins/Brown*

Newcastle University is developing its presence on the Science Central site to the northwest of the city centre, as part of a partnership-based initiative to re-position itself as a civic or public university for the 21st century. The university has been central to the city's designation as a Science City, and its strategy for economic revitalisation based on the promotion of a socially-inclusive, post-industrial knowledge society. Science Central was conceived as a form of science and technology park, integrated into the city centre, which would be a physical embodiment of the Science City and the council's partnership with the university; a former colliery and brewery site where new university research facilities would be co-located with businesses, public open space, community gardens and homes, attracting investment and government funding for research and physical infrastructure. The University's first building dedicated to Urban Sciences will open in Autumn 2017, as a resource for academics and the public, and in March 2015 benefited from the announcement of an additional £10m of government investment through the Collaboratorium for Research in Infrastructure and Cities (UKCRIC). This 'living laboratory' for sustainability research will be followed by two further university buildings in due course around a new public square, one of two at the heart of the site.

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Introduction

The University of Newcastle-upon-Tyne was established as an independent institution in 1963, shaking off its past history as Kings College (1937) of Durham University, which had itself been created through a merger of Durham's Newcastle-based College of Medicine (1852) and College of Physical Sciences (1871). Its roots lie in a more secular and science-orientated mission than Durham University's colleges in Durham, shaped by Newcastle's own, distinct, industrial economy and identity, and by a local demand for science-based education applicable to the particular fields of mining, agriculture and manufacturing. During the 1960s, the newly-autonomous University's Kings campus became integrated into a larger complex of civic institutions established through urban redevelopment, reinforcing the notion of the university's participation in the economic and social life of the city. And in the more recent past, its Centre for Urban and Regional Development Studies (CURDS) has generated a body of research in economic and urban geography which has focused on developing an understanding of how such a role might be reinterpreted in the present and future, to enable this university and others to be proactive in shaping thriving cities. The University's decision to expand onto the Science Central site north-west of the city centre, in partnership with the city council, represents then a fundamental aspect of a commitment to reinvent the university's historic mission in response to current needs.

Historical and policy contexts

1

'In my view the knowledge business of universities has both a supply side and a demand side. Our search for truth, our creative drive, and our definition of academic disciplines are part of what we can supply in terms of knowledge. Our engagement with the world, our response to societal issues, and our duty as citizens are part of meeting a demand for knowledge'

Professor Chris Brink, Vice-Chancellor (Brink 2007)

The expansion onto Science Central, incorporating an Urban Sciences building, teaching centre, and adjacent Business School, is the most recent example of the University's 'experimental approach' to campus development (Benneworth and Hosper 2007:148). It was predicated by its involvement in the International Centre for Life in the 1990s, located on a former cattle market close to the railway station. The new initiative is linked to Newcastle's nomination as one of six Science Cities in the UK in 2005, recognizing the steps it had taken towards moving on from its industrial past and reinventing itself as a hub of the knowledge economy. Noting this 'societal shift' as a general phenomenon, Chris Brink observes that it 'is bound to impact on universities, just as it did 200 years ago...' (Brink 2007:4), and the Science Central expansion represents part of the University's initiative to re-engage with its 'civic' roots in an altered economic context.

The civic university

1.1

'Is the university in the city or part of the city? ... we make the case for the civic university working with others in the leadership of the city in order to ensure that its universities are both globally competitive and locally engaged'

(Goddard and Vallance 2011:1)

Scholars from the university's CURDS centre have argued in a large number of publications for a re-engagement of universities with the cities and regions in which they are located. John Goddard, Emeritus Professor of Regional Development Studies, proposes that 'all publicly-funded universities in the UK have a civic duty to engage with wider society on the local, national and global scales, and to do so in a manner which links the social to the economic spheres. Engagement has to be institution wide commitment, not confined to individual academics or projects ... to embrace teaching as well as research...' (Goddard 2009:4). While Newcastle was not one of the original six civic (or 'redbrick') universities established in the UK's major industrial cities to deliver practical manufacturing and engineering-based skills, its civic identity was well-established in its origins, and has been given renewed vigour in the commitment enunciated by Brink to 'pursue "knowledge for life" ... causally connected with life and the world around us' (Brink 2007:9).

As Brink notes, 'universities are expected to deal with an extraordinary number of issues and agendas' (Brink 2007:5) in the transition from industrial to knowledge economy, and therefore he advocates a 'supply and demand'-driven approach which focuses on specific local and regional needs and applications. In the case of Newcastle four areas of research strength have thus been identified for development as priorities for the community and local partnerships: Sustainability (formerly Environment and Energy), Ageing and Health, Stem Cells and Regenerative Medicine, and Molecular Engineering. Each of these strands has further been linked to a particular physical site in the city, with Sustainability mapped onto Science Central.

The university in the 'science city'

1.2

By 2005, Newcastle had sufficiently established a reputation for leadership in science to be named one of the UK's six 'science cities' – regional development projects designed to generate science-based economic growth. The university's presence and research strengths had played a significant role in this designation, which described a partnership between the City Council, the University and the regional development agency, OneNorthEast (1999–2012). The university's participation in the Science City was underpinned by co-investment with its two partners in the Science Central site, a former brewery close to the St James's football ground, with a view to establishing some kind of science and technology park integrated into the city centre.

This initiative built on the university's past experience of working with OneNorthEast's predecessor, Tyne and Wear Development Company, on the scheme for the International Centre for Life (ICfL) in the mid-'90s, part-funded by the government with £8m from its Joint Infrastructure Fund. TWDC had been actively involved for some years in regenerating industrial sites in the city, but as Benneworth and Hospers report, had been criticised for a lack of community engagement (Benneworth and Hospers 2007:148).² ICfL was perceived as an opportunity to recruit university support for a project which would be seen as delivering more explicit social benefits. According to Benneworth and Hospers, 'Newcastle University put a great deal of effort into justifying ICfL, representing it as a place where life science technologies from the university could successfully be commercialised, bringing about economic development benefits, both in terms of new firms, but also helping to regenerate a former derelict quarter of the city' (Benneworth and Hospers 2007:148). This emphasis on the urban regeneration agenda underscored the emerging idea of the university as a 'planning animateur' (Benneworth and Hospers 2007) in urban policy and design, leading to the development of 'university-influenced urban landscapes' (Benneworth, Charles and Madanipour 2010:1612), as well as an agent of urban economic recovery and growth.

The City Council's Core Strategy document of 2014 refers to 'the success of the

research and development activities of the Centre for Life, Newcastle University and our hospitals' as the basis for the development of Science Central (Gateshead Council and Newcastle City Council 2014:168). The ICfL incorporates a visitor attraction – a popular science centre – alongside bars and restaurants around a new public square, NHS facilities, university biomedical research space, and commercial office space occupied by a majority of University spin-off companies. Although the Science Centre currently attracts around 250,000 visitors a year, the project has also been criticised for providing expensive office space rather than meeting the needs of regional life science firms, and for prioritising the academic research and funding needs of the university over and above wider urban benefits (Benneworth and Hospers 2007). Nevertheless, it provided a flagship for closer co-operation between the university and other urban actors in the 'Science City', based on 'the development of entrepreneurial and collaborative opportunities with other universities and commercial organisations' which the University Estates Strategy for 2007–12 set out as a key aspect of the University's Institutional Plan (Newcastle University 2008:2). In 2009, the university set up its Newcastle Institute for Research on Sustainability (NIReS) as an organisational framework for research across three faculties and to lead on the Sustainability theme within the context of a wider city partnership: as Goddard points out, the omission of the term 'university' from the name was not accidental (Goddard and Vallance 2013). It is this institute (now Institute for Sustainability), together with the Faculty of Science Agriculture and Engineering (SAgE) and Science Central team (also established 2009) which has been at the forefront of plans for the university's presence on Science Central, conceived as one of a number of new 'knowledge hubs' embedded within the city.

Growth and international research profile

1.3

Alongside the University's policy of commitment to local civic engagement and urban development, a concern to maintain and enhance its academic ranking and research profile at an international level has also been a key driver behind the rationalisation of its existing main campus and expansion onto additional sites around the city. Newcastle is a Russell Group University, ranked in the top 1% of universities in the world (QS World University Rankings 2014) and 22nd in *The Sunday Times* 2015 Good University Guide. Its Estates Strategy clearly states its mission: 'To be a world-class research-intensive university, to deliver teaching of the highest quality' – as well as 'to play a leading role in the economic, social and cultural development of the North East of England'. It is supported by a policy of 'controlled growth' in the number of home students, and recruitment of international students and staff. Integral to this ambition will be 'an attractive, cohesive, financially sustainable environment supporting the provision of a high-quality student experience and internationally renowned research. This will be delivered through a comprehensive and integrated approach to capital investment, maintenance and space utilisation' (Newcastle University 2008:1). The Science Central site then offers the possibility of constructing new, state-of-the-art research and teaching facilities, which will enhance and project the university's academic image both at home and abroad, and arguably contribute to its ability to attract students and staff. The university's project director suggests that it could drive the recruitment of 50 additional staff in the SAgE faculty itself, based both at the site and elsewhere, because of the new research and teaching programmes that the Science Central initiative enables 'across the board' (Stephanie Glendinning Nov 2014).³

Structures and processes

The University's approach to the Science Central development has been embedded in a collaborative, partnership framework from the outset, positioning the institution as one of a number of actors in a complex, long-term urban development project. The partnership approach has been complicated by shifting relationships between the actors due to factors outside the university's control, such as changes in government regional development policies and financial arrangements. However it has also delivered a range of mutual advantages and enabled the project to move forward despite difficult economic conditions. From the University's side, involvement in the project has been centered within the Faculty for Science Agriculture and Engineering, in collaboration with Computing Science and the re-named Institute for Sustainability (formerly NIReS), with an emphasis on strong academic leadership to achieve the buildings it wants, with a balanced input from the Estates team.

Partnership and co-location

2.1

The Science Central initiative is the direct outcome of an existing partnership arrangement between the university, City Council and regional development agency. The closure of One NorthEast in 2012 complicated the structural set-up, but led to a renewal of commitment to the partnership approach, with the two remaining partners buying up One NorthEast's share in the company. The Science City delivery company itself was wound up as a separate entity in March 2015, with some of its staff moving to direct employment by the respective partners and others facing redundancy. However the Newcastle Science City banner will continue as the face of the partnership – 'with a key focus on delivering the Science Central development', as stated by Vice-Chancellor Chris Brink (Newcastle University 2014b).

As Brink points out, 'The partnership has ... adapted to major challenges including the recession in 2008 and the demise of the Regional Development Agency' during its lifetime, as well as more recent public funding cuts' (Newcastle University 2014b). It has been viewed as a successful, collaborative approach which has enabled access to other sources of funding from central and European sources. Pat Ritchie, Chief Executive of Newcastle City Council, stresses that the combination of 'City Council expertise with academic insight' will further allow for an effective approach to tackling the 'big societal challenges' (Newcastle University 2014b).

Fundamental to the partnership approach is the physical co-location and interaction of university with non-university functions. The Core (or 'gateway') building, financed by the council, will house a mix of occupants from early 2015, some on a temporary basis, including the University's Continuing Professional and Executive Development (CPED) department and Cloud Computing Centre, incubator space for 'those wanting to co-locate with the university' (Pearson 2011) and, in its last few weeks of existence, the Science Central team, relocated from its home on the main campus. Operated by Creative Space Management under contract from the Council, the Core will also provide a public space available for use by different groups for events. The University's Urban Sciences building and teaching centre will be a close neighbour, providing a mix of research and teaching space for the Department of Computing Science, SAgE, and the Institute for Sustainability, as well as rentable space for start-up companies in the early stages before they become more established as commercial operations and potentially relocate to the Core: the Estates Strategy states that 'University-occupied buildings will be adjacent to business buildings to aid commercialisation of research; stem cell, molecular engineering, energy and environmental translational research' (Newcastle University 2008:8).

However, the representation of the partnership relationship has also been a delicate matter. Despite the common presentation in urban regeneration discourse of universities

as attractors to private business, it is understood that this is not always the case. Furthermore, while some businesses prefer not to work with or alongside universities – fearing they could lose their distinctive brand or end up paying over the odds for the privilege – they are no less wary of being associated with councils. As a result, some care has been taken to ensure that the Core building is clearly not affiliated with either, but representative of Science Central as an independent entity which transcends the identities of the partners.⁴

European and other funding in recession

2.2

'The high-quality design will set the tone for the whole site, and because of the nature of its use as an incubator for small businesses it would not be realistic to expect the private sector to construct it in the current climate.... The university will be the lead investor in the remainder of the infrastructure on the site'

Spokesman, Science Central (Pearson 2011)

This quotation from a local paper underlines the increasing expectation that universities will step in both to underwrite major urban infrastructure and renewal projects under the current conditions of recession and austerity, and to act as catalysts for subsequent private sector investment (Lawless 2011). For Newcastle University, investment in Science City was a significant component of a Capital Plan which projected expenditure to 2012 of £40 million for student residences and £100 million on the academic estate (Newcastle University 2008). The investment relied on the availability of external funding, including government support, and in 2011 £6m was made available from the Coalition Government's new Regional Growth Fund. In a joint statement from Newcastle University and Newcastle City Council, this provided 'further evidence that the Government believes in the ability of Science City to attract new businesses and create the next generation of jobs...' (Pearson 2011).

In total, it is reported that a minimum £50m of funding support is required to enable the entire development, of which £31.5m had been identified by 2013, including £9.33m from the University. This was matched by an equal amount from the City Council, plus 1.33m from One North East, £5.5m from the European Regional Development Fund (for site remediation), and £6m from the Regional Growth Fund (Lawless 2013). In 2011 the failure of developers to take on the construction of the Core building, or businesses to commit to taking space on the site, led the local press to suggest that the city council would have to foot much of the bill for the project, while the University would benefit from building research space 'on the cheap', as Councillor Bill Shepherd put it (Pearson 2011). However, designation in 2012 of the NewcastleGateshead Accelerated Development Zone (ADZ - the government scheme allowing local authorities to retain future business rates generated by developed sites to finance debt incurred in the initial infrastructure investment), including Science Central as one of four sites, provided access to significant new funding to kickstart development (projected to be up to £320m in total across the four sites by 2038).⁵ £8m was also secured from the Local Growth Fund to support an Energy Centre and Life Sciences incubator units on the site, while the 'Future Cities' agenda is being viewed as a source of opportunities for future funding from government and European sources (Newcastle University 2014b).

In 2013, the University countered Councillor Shepherd's accusations with an announcement that it would invest a further £50m in the construction of its new Urban Sciences building, in addition to £2m for the Cloud Computing Centre contributed by the Department for Culture, Media and Sports. Professor Phil Taylor, head of the Institute for Sustainability, described the investment as based on a 'solid business case' grounded on the prospect of 'great returns through fantastic research outcomes, collaborations with industries and other partners on the site including the city council ... an investment

in growth for Newcastle University to make sure that it stays competitive nationally and internationally' (Ford 2013).

Academic leadership and project organisation

2.3

'The business plan is obviously looking at income and cost, and for the income we needed to work out how much additional research we might get, how much additional teaching. So really that's an academic exercise'

Professor Stephanie Glendinning 2014

The University's business case for the Urban Sciences building was produced not by the University's Estates department, but by academics and researchers from SAgE, the Institute for Sustainability and Department of Computing Science, under the leadership of project champion Professor Stephanie Glendinning (Civil Engineering) in 2013. It was based on an agenda for new research rather than on any clear vision of a building as such, which had been initiated by an open call for ideas to the faculty from the new Pro-Vice Chancellor of SAgE, Stephen Homens. Homens had been tasked with making something happen on the site for the university, in the absence of any concrete proposals, and in 2012 it was decided that, in addition to a new research programme, the whole of the School of Computing Science would also be relocated to the new building. A revised Activity Plan – urbanism, sustainability, and digital economy – was produced in March 2013, signed off by the University committees over the following six months, and costed for the business plan based on information provided by academics leading on various works elements, with some input from Estates. The business case was approved by Council in November 2013, just after the architectural brief had been issued.

According to Glendinning, the Estates team had not anticipated that the academics would take so much interest in the process and such a strong lead on the project. She notes that there was quite a lot of internal conflict in the early stages. However she took advice from a colleague at Loughborough University who had led a building project there: 'he was very insistent that a build can only be successful if you have strong academic leadership on it to get the building that you want'. Glendinning's own role was shaped by her 'home' in Civil Engineering, and the fact that she had already done a secondment with Arups, the engineers on the masterplanning team for Science Central, where she sat on the consulting group for the project. It was she who assumed responsibility for decision-making in the first stage, and was released from teaching activities to take on the role of project champion until September 2017 when the building is scheduled for completion.

In addition there are a number of other champions for different elements of the project, including both the building facilities and the various user groups, with academic leads for each lab representing a specific research activity – eg the Smart Grid Lab, Cyberphysical Lab, and Urban Observatory – as well as Computing Science. It has not always been easy to resolve tensions between the different groups, which have highlighted issues of ownership over the building and played out through the refinement of the brief with the appointed architects. Furthermore, the Project Team, comprising two managers and representatives from both the academic and estates sides, is also responsible for maintaining relations with Science Central and the council.

Thus the project has generated a complex network of relationships of sometimes competing interests, which have been further influenced by the impact of the different funding streams involved in the process. The production of the brief crystallised many of these different interests. Following advice from Loughborough, Glendinning argued for making the 'key dilemmas and challenges ... explicit in the brief' (Glendinning Nov 2014), and using it to challenge the appointed architects to resolve them – no easy task.

Site organisation and timescale

2.4

Architects Hawkins Brown were appointed to the design of the Urban Sciences building early in 2014, and as they note,⁶ their task was not made any easier by the fact that the masterplan for the site was already fixed (including building masses, heights and relationships) and the corresponding infrastructure realised, imposing additional constraints on the design response. Planning permission for the masterplan, by MAKE, was finally granted in April 2012, and divides the site into four key areas which will be developed over a 20–25 year period: citing the Councils' Core Strategy planning document, 'a knowledge area including science and knowledge based industries, a live-work area including smaller-scale offices and houses, a home zone area which will be a new residential neighbourhood, which will all be supported by a local facility area' (Gateshead Council and Newcastle City Council 2014:171). It further emphasises that 'predominant uses will be research and development-related with some offices, residential and student accommodation supported by local services' (GC/NCC 2014:171), and underlines the urban and sustainable aspects of the scheme, with good connectivity to the city centre, prominent 'gateways' into the site, a pedestrian-friendly ground plane animated by retail and restaurant use, an energy centre and district heating system.

Although masterplanning work (by EDAW) began in 2007, and the existing brewery was demolished in 2008, progress was delayed by the impact of the ensuing economic recession. The financial viability of the project was severely challenged, with an estimated deficit of £100m-£150m, as was the delivery model based on the identification of a single partner for the entire project (Lawless 2011). In 2009 the regeneration company 1NG (subsequently wound up in 2011) was appointed as Development Manager, and the agreement of its economic masterplan for Newcastle and Gateshead (1Plan, leading to the joint Core Strategy), prioritising Science City development, provided the impetus for the project to move forward, with the appointment of MAKE as architectural masterplanners and agreement of outline planning consent in 2011.

Phase 1 of the development includes completion of the new Core building (2014) and two new squares (including Knowledge Square), following on from the excavation of around 50,000 tonnes of coal remaining near the surface, grouting and capping of redundant mineshafts, and remediation (2012). During the future development of the site, including the construction of the Urban Sciences building to 2017, and two further university buildings, a range of interim uses is being promoted, including community gardens, to encourage and establish public use.

Architects: briefing and appointment

2.5

'Newcastle University has appointed London-based architects Hawkins\Brown, in conjunction with BuroHappold and BD Landscapes, to design a £50 million 'living lab' on Science Central'

Newcastle University press release, February 2014 (Newcastle University 2014a)

The University's appointment followed an RIBA (Royal Institute of British Architects) competition calling for 'architect-led teams to design a distinct and recognisable [10,000 sq m] building which would underpin the University's core research theme of digitally enabled urban sustainability' (Newcastle University 2014a). It was judged by a panel including the Vice-Chancellor Professor Chris Brink, senior academics from the Faculty of Science, Agriculture and Engineering, representatives from the Estate Support Service and University Council, together with John Whiles (of Jestico + Whiles) acting as the RIBA Architect Adviser to the competition.

According to Glendinning, the idea of running an RIBA design competition came from Estates, which had been surprised not only by academic interest in the design process, but also by the academic team's readiness and ability to cut costs where necessary without a fuss. On the academic side, the competition was approached 'rather like a shortlisting for an academic post' (Glendinning Nov 2014). But there was disappointment at the quality of the initial submissions. For Glendinning, who had run a masterplanning exercise for three years and then a building design project relating to the site with fourth year MEng students, the quality and imagination seemed to fall short compared to the student work. From the architects' side however, there was frustration at the quality of the brief itself: 'it was a description of the spirit of the place, not a building' (assessor July 2014);⁷ 'academics are used to pitching for research funds – so there is never any realism in the user brief. The estates department is more pragmatic, and there's always tension' (architect Sept 2014).⁸

In the end, two teams were shortlisted on the basis that they would provide the best leadership on the stakeholder engagement side – because 'we knew we really needed somebody to drive this engagement in the design' (Glendinning Nov 2014). The RIBA assessor encouraged the client body to opt for a team it could work with, rather than a concept it liked, and score the submissions rather than being emotionally swayed by the spirit of the presentations. Hawkins Brown frontloaded the design fee in brief development and concept delivery, creating a space for developing engagement on all fronts, both with key stakeholders and client, and this proved invaluable to working towards a resolution of the challenges contained in the brief.

One of the key issues for the architects was to understand how the building could be 'a physical embodiment of sustainability research', as described in the Activity Plan,⁹ when both the concept of sustainability and a clear research programme seemed to be under-developed, despite the presence of the Institute. 'Sustainable research doesn't really exist yet at the university. The user body is a mix of hardcore mathematicians and much more interactive new computing...' (architect Sept 2014). Furthermore, the building needed to 'welcome people in from researchers, students, business people and the public' – a wide mix of visitors for different purposes – and 'be a research facility in its own right' – but 'Estates didn't know how they could operate the building or what it would cost to run ... it would be hugely expensive' (assessor, July 2014). Finally, the triangular plot defined by the masterplan and infrastructure was not considered to be an appropriate shape for the best building, but could not be altered.

Nevertheless, the university concluded that: 'The team at Hawkins/Brown demonstrated an excellent understanding of the brief to create something unique that would embody our commitment to sustainability and innovation by creating an environment that would be open, creative, inclusive and entrepreneurial' (Newcastle University 2014a). The appointment marked the start of a further information-gathering process towards the goal of designing a building that would include flexible academic spaces, start-up business incubator space, public workshop and demonstration spaces, a 'digital' library/learning centre and a café with social spaces to create informal learning opportunities. It will be a massive flat floor structure, with the possibility of converting teaching space into workspace, and a research wing fitted out with loose partitions on a 1.5m grid, allowing for flexibility and customisation. The different elements will be held together by a central forum space that will also offer the potential to be used for public engagement activities.

As the architects have commented, 'academics challenge, think and probe – they are good to work with as clients go. The spaces are not speculative, but have to work, for a specific user' (architect Sept 2014). However, they also ran up against difficulties in obtaining the information required to set up the parameters of the design, which led to delays in the programme. One problem was that users didn't understand exactly what was needed, or that the information changed; another was that many of the prospective

user groups still did not exist, ‘so you go through many more iterations of the scheme’ (architect Sept 2014). As Glendinning concurs, ‘it was a difficult process, and we learnt too late that were behind programme...’. She suggests that ‘you need one person or a very small group which takes responsibility for it, which has some relevant experience to know what the implications of particular decisions might look like’. The architects however accept that a key part of their role is mediation, and note that, compared to other sectors, Higher Education is a good one to work in.

Community engagement

2.6

‘It’s very unlikely that any of those lads would end up going to University. However, they might end up going into buildings like The Core, like the University’s new building a year or two down the line, for a day trip to understand what they’re doing about smart meters or what they’re doing about that vertical green wall. And then it’s more important that they feel that ownership – “I know what they do there and why it’s important, and how it relates ultimately to what I’ve done; I’ve built this for this backyard in Byker and I might get a job doing that one day.”’

Education, Skills and Engagement Manager, Science Central 2014

While stakeholder engagement and mediation were crucial to negotiating the first stages of the design process on the Urban Sciences building, Science Central as a whole has a remit to deliver community engagement, and the University has a key role to play in that. When Science City was set up in 2009, its role was defined as being not only to support businesses and create new ones in the science sphere, but also to carry out public engagement with local schools and communities – especially to promote science education in deprived areas (Goddard and Vallance 2013).

While Hawkins Brown has had a role to play in statutory public consultation on the design proposals, which received planning approval in July 2015, public engagement in a wider sense has so far not been key to the university’s involvement with the Science Central site, although it is likely to be connected to the urban sustainability theme. External engagement to date has been with key stakeholder partners, including Siemens, Northern Powergrid, and Northumbria Water, which have participated in collaborative workshops to input into the design process from their specific areas of expertise and interest and are recognised as strategic partners for the Institute of Sustainability.

The lack of wider public engagement to date, other than the launch of a website,¹⁰ has been partly a result of pressure to meet deadlines on the design programme. As Glendinning explained in November 2014, ‘certain decisions have to be made ... the structural form, the heating and ventilation system, the electrics and water ... all of that has to be designed into the nitty-gritty of the building, and building the engagement side in won’t happen until the next stage ... it’s waiting as part of this package to be awakened.’ However, the brief for the building design is itself founded on certain principles of public accessibility and engagement, partly in response to comments from the Council. ‘It’s being designed to accommodate, welcome – not look like a University building’, explains Glendinning, while noting that there is not an absolute internal consensus within the University on how far this should go.

According to the competition assessor, the idea of opening the labs to the public as showcases for research that would provide a forum for engagement around science, was essentially prompted by the city authorities. But in the view of Science Central’s Engagement Manager, it will take some work to persuade local people, especially from the more disadvantaged neighbourhoods of West End, Cowgate and Byker to approach the university’s buildings, which they do not see as being relevant to their own lives: ‘I know

that some of these groups in Byker would think: I couldn't do that, it's nothing to do with me'. She suggests that it is vital to do engagement work that is 'very far removed from what the University itself will be doing ... the University is not going to be working with Building Futures East, whilst they're supporting 20 lads, 16–24 years old to get basic construction skills to build vertical growers – that's not what the University is about'.

In response to this, the Engagement Manager has been building up a programme of action based on both Science Central's past engagement work at the site, especially with children, and the work of its Community Science Team, supported by European funding, in deprived areas prior to that. She is mapping out a network of community organisations that could be connected to the site and funded by EU or Lottery money via Science Central itself as facilitator. Organisations which focus on delivering skills and training to local people, especially in the areas of construction, such as Building East, and computing, could be vital in opening minds to the possibilities that the site, the university facilities, and the knowledge economy in general – with a particular emphasis on sustainability and energy technologies – might offer in the future, especially in terms of jobs. She explains that this is the sort of initiative that could: 'help local people see that whilst it seems very far away and it's not really going to help Brian pay his electricity any better, it will in the long-run. And it's important they do this so that in a few year's time Brian's Smart Meter works better and works the way he needs it to and that there's never a blackout.... And then Brian and his mates might actually want to come in to the Community's research centre, the University's Research Centre.... He might think yeah I'll go with one of me mates for the day to see it, because now I understand about these meters and how they are making them work better – it'll be good to see it' (Engagement Manager Nov 2014).

The hope is that in the long run the University might support such an approach. But in the meantime, the Engagement Manager is dubious about the value of commissioning artists to work on science-based public art projects in collaboration with researchers, as proposed. She warns, 'don't put the word "science" into anything! Because nine times out of ten people go, oh science that's got nothing to do with me...'. There is also sensitivity in the community about the loss of the city's industrial past, reflected in the decision taken (since reversed) not to re-use the Blue Star symbol of the former Scottish and Newcastle Brewery, or any of the old names in the redevelopment of a site which employed so many workers before that to work in the mines (Elswick Colliery). She suggests it is important to demonstrate the continuing ownership of local people in that history and its re-working, to challenge their sense of disconnection with the 'knowledge economy'. To that end, she worked on a project with children and adults, including many who had worked for the brewery, to make a film with a local historian about life on the site over the years and design a time capsule: 'to show them that it was still going to be industry, education and housing. And yeah the industry and the type of education were slightly different, but the history of the site really is kind of staying the same'.

Finally, she points out that the new Core and university buildings will command a magnificent view not only of the two public squares to be constructed on the site, but also of a young people's hostel and a busy soup kitchen which sit on its immediate boundaries. There is no doubt in her mind that much of the site's future vitality will stem from a mixing of social groups in its open public spaces that is not directly linked to its science-based research and business activities, but embodies the very real social needs and problems of the city which some might prefer to hold at arm's-length from Science Central. As she says, this should be treated as an opportunity for proactive and positive management within an overall public engagement strategy within which the university could play a significant role.

Visions and narratives

'Our vision on Science Central is to provide a unique environment where internationally renowned engineers and scientists can work together with Newcastle City Council, industry, communities and emerging technologies, to find solutions to global urban sustainability challenges'

Professor Phil Taylor, director, Institute for Sustainability¹¹

'This isn't just some out-of-town science park, this is right in the centre of the city'
Andrew Lewis, assistant chief executive, Newcastle City Council (Ford 2013)

The narrative around the university's involvement in Science Central has been strongly framed by the themes of partnership, collaboration, and outward-facing involvement with the city, while at the same time emphasising the idea of cutting-edge scientific research within a laboratory-like setting. In fact the concept of the laboratory is evoked in a number of ways within the projected vision of the university's presence on the site. On the one hand, the new Urban Sciences building itself is described as a 'living laboratory'; while on the other hand, the city is framed as an 'urban laboratory' which is the object of the university's scientific research carried out inside the living laboratory – specifically a research programme focused on sustainability, with the goal of discovering solutions to key urban problems, which might be further developed as universally applicable principles. The University's Science Central web pages state that: 'Engineers, scientists and digital researchers will work together with industry partners Siemens, Microsoft, Red Hat and Northern Powergrid, to discover solutions to the urban sustainability challenges we face', and describes the new facilities as 'a beacon of urban innovation'¹² where new urban technologies will be trialled. As such it has been hailed by Future Cities Catapult as a leading urban innovation hub in the UK.

The 'living laboratory'

3.1



Urban Sciences Building: perspective view, north-west facade.
Image courtesy Hawkins/Brown

In 2014 a 'revamped vision' for Science Central was unveiled by the partnership, in which 'City Council staff and University researchers will work together to create a living laboratory to map out the city of the future ... it will combine digital ingenuity and sustainability research with social innovation to lead advances in the development of future or "smart" cities...' (Newcastle University 2014b).

As previously noted, this vision did not start with a building, but emerged rather out of an open call for research ideas, subsequently translated into a research agenda, or activity plan, and only then into an architectural brief. Goddard and Vallance note that the grounding of the sustainability research theme in a physical site at Science Central was probably valuable in terms of encouraging academics to focus their research towards urban development embedded in Newcastle, and specific applications (Goddard and Vallance 2013). From the outset, the site offered opportunities for developing learning processes in dialogue with the masterplanners and engineers (ARUP) appointed to produce a strategy for its remediation and use. For example, a 2km long, 8 inch-diameter borehole was drilled to access geothermal energy from hot water (50+ deg C) underground which it was hoped could be used to heat buildings on the development and beyond. Ultimately the flow rate proved to be too low to use as a single energy source, but as the council's director of investment and development stated, 'It was really exploratory and in essence achieved everything that was set out by academics [working with Mott MacDonald], about understanding geothermal heat' (Proctor 2014). Newcastle academics also provided a qualitative sustainability assessment of options for extracting, or leaving and infilling underground, 30,000 remaining tonnes of coal – favouring the former.



Urban Sciences Building: study of modular facade system. *Image courtesy Hawkins/Brown*

When the building is ready, it will have a wild-flower rooftop garden to promote local biodiversity, and plug in to Science Central's district heating infrastructure and sustainable urban drainage system. The modular façade system has been designed to reduce on-site waste and provide solar shading, in collaboration with Martyn Dade-Robertson, a lecturer in architecture and computation in the School of Architecture, Planning and Landscape. It will also house the Cloud Computing Centre for Big Data, which will move from The Core, while the Cloud Innovation Centre will provide a forum

for engagement, data-sharing and knowledge-transfer with business and the public sector.

Newcastle is not the only university to have promoted the idea of the 'living laboratory' for grounded research focused on urban sustainability – notably the University of Manchester has been developing similar ideas, but on a smaller scale, embedded in its existing campus with a focus on smart technology (Evans and Karvonen 2014). But Newcastle has been in the forefront of ideas around the development of physical facilities themselves as a resource for applied sustainability research (although Manchester again is working towards a similar goal with the design of its new Engineering building). This is driving a particular vision of the Urban Sciences building both as an experimental site for teaching and research and a material representation of what the university stands for in this field.

New approaches to learning and teaching space

3.2

'We are leading in terms of sustainability, we have to lead on that and show that we are actually doing something different ... what we need to produce is something that looks different and is looking to the future...'

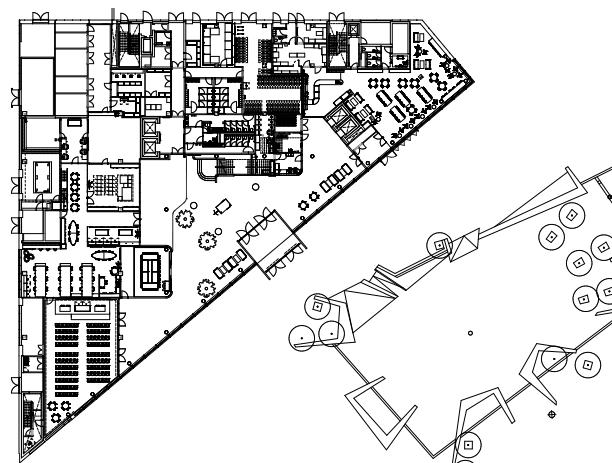
Professor Stephanie Glendinning 2014

The design agenda for the Urban Sciences building is concerned with creating an environment which both enables and represents to a wide audience new ways of working in the field of digitally-enabled urban sustainability. In an interview with a local paper in 2013, Professor Phil Taylor, heading the Institute for Sustainability, stated that the way

to ‘make big breakthroughs’ in research that would bring sustainability to cities around the world, was by building ‘cutting-edge labs’ and multi-disciplinary spaces in which academics, researchers and students could work together in more collaborative ways. ‘It is about trying novel ideas and research and taking them forward to be used in infrastructure into 2030, 2040, 2050’, he said (Armstrong 2013). Alongside the labs (including a unique Cyber-Physical laboratory), some of which will potentially be open to the public, will be ‘maker space’ owned by one of the research groups, and an Urban Observatory and Decision Theatre for processing urban data (relating to water, energy, waste, transport and digital control systems) – as well as the Cloud Computing and Innovation centres, a lecture theatre, central forum, café and shops to draw the public in.



Left: Urban Sciences Building: section through public forum space. *Image courtesy Hawkins/Brown*
Right: Urban Sciences Building: ground floor plan. *Drawing courtesy Hawkins/Brown*



The architectural plans have been developed through a series of user workshops and the core project team within the university, which revealed a certain amount of tension between those in favour of open-plan space (particularly on the Estates side) and those who wanted to maintain quiet individual working spaces, but also an existing ‘diversity of working styles’, especially within Computing Science – from those who ‘don’t even have a desk’ and will sit down with a laptop anywhere, to those who ‘want absolute visual and noise cut-off’ (Glendinning Nov 2014). Equally, it became clear that people had very different ideas about what the building should look like on the outside – whether a conventional design that stands for the traditional university and civic values, or something different that reflects the innovative and experimental vision behind the facility and its working-spaces within.

However, these conflicts have run alongside an aspirational narrative about a building which could provide a model of integration – integration at several levels, between academics, researchers, business people, and members of the public, but also between users and the building fabric, and between different elements of the building fabric itself. As Professor Glendinning explains, ‘lots of elements of a building are studied as single systems. But our aim is to look at the integration of those, and to look at the integration of those with the users. So for example, we could use the expertise we’ve got in both Cyber Physical Systems and Smart Grid Technology, or Human Computer Interaction and Building Monitoring Systems, to do some novel research at the building scale’ (Glendinning Nov 2014).

But what does all this mean to the general public? With a lack of structured public engagement to date, the University has depended on press releases and coverage in the local press to communicate its vision of an innovative and integrated research facility that has relevance to real urban problems. This has translated into headlines such as: ‘Newcastle planning £50m hi-tech Science City: new “intelligent buildings” are being constructed to keep track of everything from energy use to workers’ movements’

(Armstrong 2013). In this story – and very much not in line with the academic vision, which is acutely aware of the privacy and ethical issues it raises (it is conducting a pilot study to understand these more fully) – the proposed Decision Theatre is likened to ‘the one seen in the Hollywood movie The Hunger Games’. It is suggested that the new buildings will have special monitors and sensors in the walls to follow energy use and workers’ movements, while Twitter and Facebook will also be monitored. It further references a ‘City of the Future’, with the potential to monitor and manage traffic and pollution through road sensors connected to the Cloud Computing Centre, and academics teaming up with business ‘to bring green technology to the masses’. But this disparate array of popular reference points fails to add up to the coherent vision of urban sustainability which the university has put its name to, and reinforces the sense that there is more work to be done in grounding that vision in the public domain. As a first step in that process, a series of scenarios, or ‘vignettes’, have been published on the University’s Science Central web pages to tell illustrated stories about a future sustainable Newcastle that different public audiences might relate to.¹³ As it says, many of these scenarios of the future (eg increased flooding) and proposed responses are ‘rapidly transitioning from a dream into physical reality’, and sustainability research and translation carried out at Science Central will have an increasing role to play in that process.



Left: Green flood management: vignette. Right: Smart energy network: vignette.
Illustrations by Katie Chappell, www.katiechappell.com © Newcastle University.

Sustainability?

3.3

‘Our vision and commitment to being a world-class civic university means we do not just look at what we are good at but also what we are good for. One of the areas in which we make a contribution to civil society is urban sustainability, and it is very pleasing that we have now found academic and financial resources to make a major push’

Chris Brink, Vice-Chancellor (Armstrong 2013)

‘We envisage an aesthetically eye-catching building, which makes a statement about our core theme of digitally enabled sustainable urban environments’
Project Brief 2014

Science City has been defined from the outset as an innovation hub for a zero carbon future and urban sustainability, and the University’s Institute for Sustainability was established

as an interface for the University's engagement in that initiative. The masterplan for the site was embedded in a Sustainability Framework which included a range of indicators and targets, but at the same time the planning authorities recognised 'some challenges' – notably, sustainability versus viability, and the difficulty of maintaining flexibility for the future within approved, fixed design parameters, both of which raised the question, 'how to stay true to the vision?' (Lawless 2013). As a result, the framework was never really finished, and nor was there any system of governance to enforce its implementation. This made it difficult to develop a specific sustainability framework for the new Urban Sciences building which also speaks to the sitewide framework, although a bespoke framework is now in place; while at the same time, the idea that it should make a clear aesthetic statement about sustainable environments is core to the vision written into the brief.

According to the Project Manager, 'It's quite easy to say sustainability is in everything we do ... [but] actually we don't really understand what sustainability is ... and [it's] difficult to make sustainability actually work in practice' (Glendinning Nov 2014). But, approached as a 'laboratory' for experimentation, this is perhaps precisely what this project can do – in part by embedding the building within the bespoke sustainability framework as a critical element for delivering its outcomes at all stages of the building lifecycle, from design through procurement, construction and in-service. While at an overarching level, it is what the University is geared to achieve as part of its contemporary civic mission.

Translation into place

4

'Knowledge-based economies are driven by market forces that seek to come closer together in dense and complex relationships ... it is not just about the numbers of people and their levels of skills, but the extent to which they form relationships with their employers, suppliers and clients, and, crucially with local places of learning and culture on an ongoing basis.... These flexible, mobile and ever more diverse knowledge workers demand ever higher standards of environment, housing, public realm and cultural capital'

One Core Strategy 2030 (Newcastle Gateshead 2010:14)

As this statement from the Newcastle Gateshead economic strategy demonstrates, there is a well-established belief in the transformative powers of the knowledge economy at the local level of place and culture, which has been a driver behind the Science Central initiative. The historical displacement of the colliery by a brewery and now by an innovation cluster, or knowledge hub, reflects a process of evolution which foregrounds physical emplacement as much as virtual connectivity, recognizing the effects of human association on urban change. But as Science Central's Engagement Manager stresses, knowledge-based economies can also fail to achieve inclusivity at local level, resulting in a disconnection of existing communities from new developments.

Site context: regeneration

4.1

There are currently two new buildings at the Science Central site – one is the brand new Core building within the site boundary, the other is the recently finished new Sikh gurdwara just outside it to the northwest of the site. The latter reflects the varied ethnic mix of people who have been associated with the site over many decades; while along the western boundary of the site is a row of small houses operated as hostels of different sorts by the

Cyrenians. To the east lies St James's Park football ground, a number of new-built towers of student accommodation enlivened with colourful cladding, and the University's Business School. These structures now overshadow the popular People's Kitchen, situated a stone's throw from the Core, housed in an attractive historic building across the new square.

The academic team at the university are working together with senior management to produce a strategy for engagement with neighbours around the site, which at 24 acres will be the largest city centre development for a generation, situated just west of the main retail area, and southwest of the civic centre and main university campus. It is described as a 'city centre extension', in contrast to the ICfL – 'a science village' located on a former cattle market close to the River Tyne. A short stone's throw further west lies the university's Campus for Ageing and Vitality, a partnership initiative with Newcastle Hospitals, located in the heart of the West End. It is this western and north-western edge of the city which represents some of its most disadvantaged areas, where issues such as healthy eating, smoking, lung cancer, diabetes, unemployment and fuel poverty have been the focus of previous work by the Science Central's Community Science Team. One of the key organisations which collaborated with the team on these projects was Centre West, the former New Deal for Communities (NDC) group, which also participated in a multi-actor action research project for the West End, Developing Low Carbon Neighbourhoods, partly facilitated by the University's Business School through a Beacon North-East Fellowship grant.

Thus Science Central is strategically located as a 'gateway' to the centre, in close proximity to those areas of the city identified as being most in need of regeneration, which since 2000 have been the focus of engagement work by Newcastle NDC to stimulate participatory neighbourhood renewal over a 10-year period in 13 locations identified by indicators for social exclusion and multiple deprivation.¹⁴ The hope then is that increasing participation and physical presence on the part of the university will help to realise the city authorities' existing ambitions relating to social justice and equality through economic and cultural regeneration: 'Newcastle will be a fairer and more equal city, with our growing population participating fully in the economic, social and cultural life of the city' (Newcastle City Council 2010:2).

Planning policy context

4.2

Newcastle's Core Strategy identifies the northern edge of the Urban Core as a Civic Sub-Area – stretching from Science Central on the West, to the two universities¹⁵ and Civic Centre on the East – containing important arrival points into the city (one mainline station, two metro stations and two bus stations). It states that it will support growth in the area through science and educational development, particularly at Science Central 'as a key site for growth in the knowledge economy including science, research and residential uses' (Newcastle Gateshead 2014:166), enhanced by its ADZ Status. In addition, the site will enhance the Urban Green Infrastructure Network by providing new public open spaces.

The overarching framework for this planning policy is the need for the city to grow in population (to 500,000 by 2030) and diversify in its economy, making a concerted effort to attract in-migration from other countries in order to fill the skills gaps that exist in relation to the development of a knowledge economy. The metropolitan core of Newcastle Gateshead was identified in the Regional Spatial Strategy (abolished in 2010 by the Coalition government) as a suitable and sustainable location for growth and a driver for regional regeneration. This indicated both the development of new and varied employment opportunities (14,000 new jobs by 2030), and the improvement of the physical environment, especially in terms of housing (21,000 new homes) and public space, to make it more attractive to incoming workers. The Gateshead and Newcastle councils accordingly

formed a joint development strategy (see Newcastle Gateshead 2014) which ‘represents a continuation of our ongoing partnership working on culture-led regeneration, housing market renewal, growth points and most recently our economic master plan “the 1Plan”’ (Newcastle Gateshead 2010:2). This is informed by four main themes which have grown out of the two councils’ Sustainable Communities Strategies:

- Economic growth and prosperity – a place of opportunity with a flourishing economy driven by science, creativity and innovation, a place recognised for and characterised by a highly skilled, inclusive working population.
- Health and wellbeing – a place of high rates of emotional and physical wellbeing, delivered through encouraging and promoting healthy lifestyles and reducing inequalities across NewcastleGateshead.
- Homes and thriving neighbourhoods – a place where people choose to live that offers quality-housing set in safe, attractive neighbourhoods with good access to employment, education and health care.
- Sustainable quality of place – a place that maximises the potential of its landmarks, environment, riverscape, townscape, heritage and culture – using these to inform standards for development across NewcastleGateshead.

(Newcastle Gateshead 2010:3)

Science Central represents one component of a wider spatial strategy identifying a number of key sites for regeneration, which has been developed with the aim of translating these themes into place-embedded reality, and ensuring that all the city’s communities have access to facilities, opportunities and housing. In this context, the university may then be positioned as an ‘anchor institution’ for the mixed-use development, bringing investment and reputation rooted in local knowledge in a time of scarce public funding, and acting as an attractor for further investment from both private and public sources.

The university as anchor institution

4.3

[This is] our opportunity to take the research out of the university into the city and then beyond. It's built on the underpinning research strengths of the university, one of which is sustainability. [We'll] take those over to the Science Central site which then forms a hub to get further engagement and generate new business. The individual research interests will continue in the university ... the added value is jobs, prosperity, improving life in the city ultimately'

Professor Stephanie Glendinning 2013 (Newcastle Science Central)¹⁶

The term ‘anchor institution’ has become current in the UK during the period of economic austerity since 2008, transplanted from the States as part of a conceptual framework of approaches to filling the gaps left in the organisation of economic and social life by the withdrawal of public funding (Work Foundation 2010). In 2001, Maurrasse highlighted the potential of higher education institutions to lead on partnerships in urban areas aimed at revitalising communities in the US, within the context of devolved federal responsibility for social services to local institutions. He further stated that, because universities and colleges were so embedded in urban situations, ‘the fate of communities is the fate of higher education’ (Maurrasse 2001:5). In the UK a similar pattern has emerged, with universities increasingly becoming involved in local economic development partnership vehicles and physical development projects which offer the potential to build stronger relations with community and business interests (Goddard and Vallance 2013).

This process often involves a willingness on the part of the university to become more mobile in terms of embracing new sites and bringing new communities of people to them – and less inward-focused at a bounded primary campus. But for academics and

students alike, this can be also be difficult, especially when commuting between two or more different work locations is implicated. Many faculties are reluctant to move wholesale to remote facilities set apart from the central hubs of university administration and management. In the case of Newcastle, the decision to move the whole of the Computing Science department to Science Central has been couched within a narrative around the building as a cutting-edge research laboratory that will offer better quality research and teaching space. On the main campus, space is at a premium, especially in terms of resources for teaching and learning. The Estates Strategy has prioritised space use reduction and rationalisation, which will be compensated for by expansion onto other sites. The Business School has already relocated close to Science Central, and it is only a 15-minute walk away. But nevertheless, the idea of relocation has been an issue for staff who see it as a significant distance, and worry about the idea of separation from the main campus.

Furthermore, many academics may fear the loss of a more exclusive academic environment in which to work, and resent the feeling of being coerced into social engagements as part of economic regeneration initiatives which they do not regard as primary within their research. While there is a body of academic research at Newcastle, particularly within CURDS, which has made an explicit engagement with its local and regional context, most university research generally is conducted at an international level of engagement. As a result, university relocations even within cities have to be embedded within larger institutional discourses which draw on a sense of a university's unique history and identity. In the case of Newcastle this has leaned heavily on the idea of its civic roots and mission in the industrial city, and the need to reinvent itself to meet the demand for relevant knowledge in the 21st century.

Economic regeneration

4.4

'Newcastle has a great economic future. A working city, with a vibrant city centre, new industries and new jobs in growing sectors, opportunities for our people to acquire new skills. A great student city which brings young people from across the world to study and contribute to our society.... A city willing to intervene to support the economy, with an ambitious investment plan, and active measures to support jobs and skills'

Nick Forbes, Newcastle City Council Leader (Newcastle Gateshead 2014:2)

Newcastle University has been central to the city's plan of action to intervene in the economy and promote spatial development to support it, particularly through the Science City Partnership initiative. A University press release affirms this contribution: 'Since its inception Science City has supported over 755 regional companies to commercialise new ideas, created 43 new companies, and in the last year alone helped over 6,000 schoolchildren across the city to get involved in science-based events and activities and to see what it could mean for their future' (Newcastle University 2014b).

The university's reputation for being able to deliver in terms of creating spin-off companies and urban regeneration was established with the earlier ICfL initiative – but Benneworth and Hospers suggest that in reality 'its formal relationships with ICfL were arm's length' and that its main priority was to secure investment from external partners for scientific projects directly relevant to its professors' own research. Nevertheless, it demonstrated that regional engagement could be something 'from which many professors could benefit' (Benneworth and Hospers 2007:148), justified by the university's own criteria relating to its identity as a Russell Group research institution.

In terms of the Science Central initiative, it took the University several years

to decide what presence it wanted to have on the site itself, and even as plans for the new Urban Sciences building are submitted for planning permission, there is a certain lack of definition about who will occupy the new building, particularly in terms of any potential spin-offs or business engagement. Indeed, the university's role in the development has been regarded with some scepticism during the history of the development. As one councillor, formerly in charge of regeneration, warned in 2011: 'It is important that this is not just a chance for the university to build research facilities on the cheap with the bill picked up mainly by the city council. Our original aim was that we wanted this to be the site that will find a home for the firms which are at the beginning of becoming the next Boeing, the next Microsoft, the next Amazon, to see that happen in Newcastle and see Science City as the crucible for this. If what we end up getting bit by bit is just another shopping centre and some flats next to purely university-based research that will be a huge failure for the city' (Pearson 2011).

From the university's perspective, however, the research facilities are not cheap, and the university has picked up more than 50% of the bill. It shares the fear that the innovation cluster concept might not materialise – but its fears coalesce around the role of the council in the initiative and its lack of resources, despite the fact that in 2012, coming through the worst of the financial crisis, Newcastle Science Central had re-affirmed its confidence that: 'backed by Newcastle University and Newcastle City Council, the scheme will have huge potential to attract new businesses and help support job creation and long-term investment for the city over the next 15 to 20 years ... the work will be completed by summer 2014, bringing the reality of the new urban quarter into view for people living and working in the city, alongside potential investors'. The Council's Head of Development Management summed up the anticipated overall project benefits as: 1,900 net jobs (4,500 gross; with 163 in the first phase completing Nov 2014); 17,4710sq m of mixed-use development including 550 new homes; and £225m of private sector investment. It would enhance Newcastle's reputation in the knowledge economy and sustainability research and practice, and provide space for high-growth knowledge intensive business (Lawless 2011, 2013). The Science Central website further stresses its potential as a new innovation hub which 'offers companies the ideal environment to work alongside like-minded individuals, a place to collaborate and share knowledge and expertise' – while also pointing out that is already part of 'one of the largest economic centres in the North of England, home to over 600 leading global firms including Wellstream, Duco, Nissan, Bridon, Procter and Gamble, Nestlé, The Sage Group, Northumbrian Water Ltd, Siemens and Northern Powergrid', and so well-positioned in terms of 'making the most of a loyal and motivated workforce, highly competitive labour costs, [and] the highest graduate retention rate outside London' (Newcastle Science Central n.d). Furthermore it is well integrated within the urban centre of Newcastle, within easy access of city-centre amenities, making it an attractive environment in which to work.

When the University pledged its further £50m of investment in a new building in 2013, with two further buildings in the pipeline, the local press seemed to concur that the development offered an exciting prospect for the city. One indeed that lends substance to the idea, promoted by two of the university's own academics, that 'Through the development of these urban sites, universities can contribute more widely to the physical and symbolic regeneration of cities, particularly when this regeneration is seen as part of a move towards a post-industrial knowledge-based economy and society' (Goddard and Vallance 2013:19).

Social impacts and inclusivity

4.5

'We hope the local community will embrace the opportunities which will be generated throughout the evolution of the Science Central project and it is our vision that it will form a large part of the fabric of the city. It will be a vibrant quarter where local people can work, play and live, linking the West end to the city centre.'

Colin MacPherson, Science Central Development Director 2012 ¹⁷

If the perceived and potential social impact of the university's involvement at Science Central is both physical and symbolic then it is interesting to consider not only the longer-term projected social benefits for Newcastle's population in terms of jobs and access to housing and amenities, but also the material and visual impact of the site as a symbol of the city's transformation during its development. Much emphasis has been placed on the importance of interim uses of the site, as a means of drawing the public in both to the place and the idea of the development during its materialisation. These include community gardens, parkland, public art commissions, areas for university trials, and an innovative temporary structure for the university that could seed the idea of engagement, again through artist commissions, around science from a public perspective – as well as provide leverage for early inward investment in its research programmes. Once the Core building is up and running there will also be space available for community groups to use for events.

But, if the idea of social as well as physical remediation of the site is intrinsic to its reinvention, with the public good in mind, there are also potential conflicts embedded in the conditions of its location in the city which may not be easily resolved. 'I think the dynamics on that piece of land will be interesting', observes Science Central's Engagement Manager: 'People's Kitchen feeds people below the minimum wage, people who have maybe a council house or are in sheltered accommodation, but they can't afford to feed themselves. They will congregate in one of the public squares outside the University's brand shiny-new building – I think we need to acknowledge that. So for example, make sure that all the left-over food from The Core goes to the People's Kitchen.... So the Core will be here, the young people [from The Foyer] will be there and the older people will be there. They've also built accommodation with over 2,200 rooms for foreign students right beside The People's Kitchen and the University's new building. And I know because of the space that there will be skate-boarders and there will be Parkour...' (Engagement Manager Nov 2014). In addition, match days at neighbouring St James's Park will bring supporters 'past the front door of the university in their thousands' (architect, Sept 2014). So while the principle of public access, permeability and visibility is enshrined in the masterplan for the site, the implications for spontaneous and potentially volatile social interactions, and in turn the introduction of security and surveillance measures, are not yet clear.

As the Engagement Manager also notes, there are many organisations which have been doing effective work with different groups in the city to tackle social exclusion, at least since the launch of the New Deal programme, who could be invited to make proposals on these issues. She suggests there is scope for programming co-ordinated activities – for example skateboarding contests – which would be a positive use of the public space alongside its occupation by an international crowd of knowledge workers working and living in the new buildings. It offers a vision of Science Central as a source of social benefits conceived as embracing both inclusivity and diversity, based on a participatory approach which is already enshrined in the city council's own Core Strategy, based on the principles of fairness and equality.

The public engagement around Science Central is an important channel for ensuring that its social impact is inclusive, recognising the fact that for many local people the

opportunities it offers seem very far away. So, 'for every stem company, for every scientist and engineer that they employ at the top, there's about three or four non-STEM people that keep that business running: who are the accountants, who are the admin, who's doing the logistics, who's delivering stuff to them, right down to the cleaners and the security guys ... it's about helping the local people see that they *could* have some involvement' (Engagement Manager Nov 2014). For this reason, the Science Central team has been busy creating a 'pipeline of skills', which involves connecting local organisations like Northern Architecture and Building East to Science Central to ensure that local people will be qualified in future to participate in what it has to offer – as well as the in-migrants from overseas who may know it first from seductive images in glossy brochures.

Key issues and learning points

5

Key drivers Newcastle University's investment in and development on the Science Central site was conceived as a core element of the city's strategy aimed at reversing post-industrial city decline and promoting a knowledge economy. Social inclusivity and participation were key to the vision for the economic plan, with an emphasis on science education in disadvantaged communities. The University's partnership with the City Council and Regional Development Agency was designed to forward that agenda and identified with the physical site even before the university had a clear idea of the academic facilities it wished to build there. The partnership structure has changed over time due to government policy changes, but the development initiative has provided a vehicle for combining City Council expertise with academic insight in the pursuit of the city's urban sustainability goals

Funding the University has committed £50m to the construction of its Urban Sciences building, but the development of the site as a whole, including the costs of remediation, has relied on external partnership funding from sources including local, regional and European growth funds. While the partnership approach has opened access to various sources, it has also led to some instability and lack of overall control, as well as exerting influence over the way that phasing structures have been determined.

Location the expansion of the University onto Science Central is intended to position the university more fully within the fabric of city. The brownfield site was formerly a colliery and brewery, and is located in close proximity to the city centre, as well as the local football stadium, and a number of hostels. Beyond its northwest boundary lies the city's West End area, which has been the focus of various New Deal initiatives in the past to address issues around unemployment and health. The areas around the Science Central site are also ethnically diverse, having been occupied by many different migrant groups over the years, and there is some sensitivity among local people about the loss of its industrial heritage.

Masterplanning and design the principle of public access and permeability is enshrined in the masterplan, which was designed by EDAW, Make and Arup. It provides a framework for development on the site which is characterised by the co-location of university and non-university buildings intended to be indistinguishable from each other, and the creation of significant new areas of public space accessed via a series of 'gateway' points from the city centre. The architects for the Urban Sciences building, Hawkins Brown, have translated a brief based on a research activities plan into a scheme for a research building that includes public access, but the route to resolving the relationship between the

academic and architectural visions was not straightforward, and depended on university leadership invested in a very small project management group. Research space will be capable of customisation by academics to suit diverse working styles, using a system of flexible partitions.

Academic programming the academic programme is based on a series of designated research laboratories, bringing together the Institute for Sustainability, Faculty of Science, Engineering and Agriculture, and Department of Computing Science. It provided the basis for a business plan put together by academics on the basis of projected income from teaching and research, and a commitment to the idea of strong academic leadership to get the building that they wanted. The remediation and infrastructure work on the wider site has also been used as an opportunity for applied academic research especially in the area of geothermal heat, but not for public engagement around the concept of sustainable development. The difficulty of conveying an accessible vision and understanding of sustainable development into the public domain is currently being addressed by the university.

Non-academic engagement part of the remit for the development is to engage local communities in science education. However there is a need to generate engagement programmes that are relevant to local communities' real needs, especially in the areas of skills and training, as well as the existing social dynamics around the site that will have an impact on the way it is occupied in future. There is an emphasis on the importance of interim uses during the long-term development process, and the promotion of commercial research translation and start-up enterprise alongside, but not over-identified with, academic facilities.

Specific assets firstly, the project has been strongly led from the academic side, surprising the university's estates team. Secondly, it has been driven by a sustainability agenda in several dimensions – as an academic research programme; embodied in the material fabric of a research building; and framing the relationship of the university with the city conceived as a 'living laboratory' for sustainability research with the potential to be scaled up to international level. Thirdly, it encompasses an explicit agenda around the re-positioning of the university within the city, pursuing a civic mission, that draws on its historic identity to develop a fresh idea of the public university for the present and future.

Notes

- 1 See also Goddard, J., Kempton, L., and Vallance, P., 2013, 'The civic university: connecting the global and the local', in Capello, R., Olechnicka, A., and Gorzelak, G. (eds), *Universities, cities and regions: loci for knowledge and innovation creation*. Abingdon: Routledge
- 2 Paul Benneworth was at this time based in Newcastle University's CURDS
- 3 Stephanie Glendinning, Professor of Civil Engineering, and project manager within SAgE for Science Central, interview with Clare Melhuish at Newcastle University, November 2014. All further attributed quotations as cited, unless otherwise stated
- 4 As reported by Education Skills and Engagement Manager, Science Central, interview by Clare Melhuish, Newcastle University/Science Central, November 2014. All attributed quotations as cited, unless otherwise stated.
- 5 Newcastle City Deal, July 2012, accessed at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/221015/Newcastle-City-Deal-Paper.pdf
- 6 In interview with project team at Hawkins Brown Architects, London, by Clare Melhuish, September 2014
- 7 Assessor, interview by Clare Melhuish, London, July 2014. All attributed quotations as cited, unless otherwise stated
- 8 Architect at Hawkins Brown, interview by Clare Melhuish, London, September 2014. All attributed quotations as cited, unless otherwise stated
- 9 'Transforming sustainability research in Newcastle: a unique interdisciplinary environment for research, learning and engagement on Science Central'. Activity Plan, SAgE, Newcastle University
- 10 <http://www.ncl.ac.uk/sciencecentral/about>
- 11 [http://www.ncl.ac.uk/sciencecentral \(since updated\)](http://www.ncl.ac.uk/sciencecentral (since updated))
- 12 [http://www.ncl.ac.uk/sciencecentral \(since updated\)](http://www.ncl.ac.uk/sciencecentral (since updated))
- 13 <http://www.ncl.ac.uk/sciencecentral/smartzcity>
- 14 Newcastle NDC was one of 39 created nationally as part of a new government initiative to tackle social exclusion under New Labour. See also discussion in Lawless and Pearson 2012
- 15 That is, University of Newcastle-upon-Tyne, and Northumbria University
- 16 <http://www.newcastlesciencecentral.com/about/sustainability>. NCL Science 2013, <https://www.youtube.com/watch?v=gxducO9nTsU>
- 17 Newcastle Science City, press release 9th Aug 2012, 'Science Central Vision moves one step closer'

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